DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT REPORT (SCH#1999044004)

Tule River Basin Investigation / Tule River Spillway Enlargement Project

October 2020

PREPARED FOR:

Lower Tule River Irrigation District

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Draft Supplemental Environmental Impact Report

Tule River Basin Investigation / Tule River Spillway Enlargement Project

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EXECUTIVE SUMMARY

Introduction

This Environmental Impact Report (EIR) has been prepared as a Supplemental EIR (SEIR or Draft SEIR) to the United States Army Corps of Engineers (Corps) Final Environmental Impact Statement/Final Environmental Impact Report (State Clearinghouse number 1999044004) for the Tule River Basin Investigation in September 1999 (1999 FEIS/FEIR). The 1999 FEIS/FEIR analyzed the potential environmental impacts associated with the implementation of the Richard L. Schafer Dam, Tule River Basin, California; Tule River Spillway Enlargement Project (Project) at Lake Success reservoir located approximately 6 miles east of Porterville in Tulare County, California. This SEIR discusses the potential environmental impacts of minor changes to the Project description as well as changes to the regulatory setting and physical environment that have occurred since the 1999 FEIS/FEIR was certified. The Lower Tule River Irrigation District (LTRID) is the Lead Agency for this SEIR pursuant to the California Environmental Quality Act (CEQA) and the CEQA Guidelines. The Corps is the federal sponsor on this Project and is preparing an Environmental Assessment for the Project in accord with the National Environmental Policy Act (NEPA).

Proposed Project

The Corps and the non-federal sponsor, LTRID (CEQA Lead Agency), are proposing to construct a 10 foot-high concrete ogee weir across the emergency spillway at Richard L. Shafer Dam, which would raise Lake Success' gross pool elevation from 655.1 feet to 665.1 feet NAVD88 (652.5 feet and 662.5 feet NGVD29, respectively). The gross pool elevation is reached when the water level in the reservoir is at the crest of the spillway and generally represents the elevation where all flood storage in the reservoir is filled (Corps 2016). Due to the increased gross pool elevation, land or flowage easements would be acquired around the lake by LTRID. The California Highway 190 bridge that passes over the lake would be armored with additional rock revetment and rock slope protection would be added to Frazier Dike. Several existing structures and supporting utilities at both the Rocky Hill and Tule Recreation Areas would need to be relocated or flood protected. Construction also consists of replacing and raising fifteen (15) Southern California Edison (SCE) transmission towers with fourteen (14) new H-frame hybrid structures and reconductoring approximately 15 miles of transmission lines to meet minimum clearance criteria resulting from the increased gross pool. Additionally, SCE will also remove or replace

approximately 40 distribution facilities due to the rise in lake elevation. Phase 1 covered (1) widening the emergency spillway from 200 feet to 365 feet, (2) relocating the existing road, Worth Drive/Avenue 146, through the spillway to the new road bench constructed as part of the spillway widening, and (3) restoring the lower third of the spillway to its original design grade using excavated material from the spillway widening. Phase 2 would include (4) constructing a 10-foot high concrete ogee weir over the existing spillway sill, (5) flood-proofing restrooms at the Tule and Rocky Hill recreation areas, (6) extending and widening the Tule Recreation Area boat ramp, (7) enlarging parking capacity at Rocky Hill Recreation Area to replace parking areas lost during higher gross pool levels, (8) protecting in place the Tule Recreation Area well and storage tank by an earthen berm, (9) relocating the Rocky Hill Recreation Area storage tank, well, and metal shed to higher ground, (10) placing rock revetment along the State Highway 190 bridge abutments for erosion protection, (11) placing rock revetment (approximately 2,500 linear feet) along Frazier Dike for erosion protection, and (12) replacing and raising fifteen transmission towers with fourteen new H-frame hybrid structures and reconductoring approximately two miles of transmission lines to meet minimum clearance criteria and removing/relocating approximately 3 miles of distribution facilities due to the rise in lake elevation.

Purpose

Currently, flooding downstream of the Richard L. Shafer Dam can cause extensive damage to residences, agricultural farmland, and public facilities. Under current operations of the existing dam, releases greater than 3,200 cfs have caused damage to downstream agricultural areas. The downstream channel capacity ranges from 10,000 cfs through the City of Porterville to as little as 3,200 cfs west of the city. Agricultural lands west of the city are where property damage and danger to residents have historically occurred, given a release greater than 3,200 cfs (Corps 2011). The existing dam controls downstream flows by making releases through its outlet works. When the reservoir elevation exceeds the emergency spillway crest elevation (currently 655.1 feet, NAVD88), uncontrolled flows are released into the downstream channel. The existing spillway crest elevation corresponds to a flood event with a 2.2% annual chance exceedance (ACE) (approximately, the "46-year flood"). Thus, the current emergency spillway is undersized and not capable of passing the probable maximum flood (PMF) within present freeboard requirements (freeboard is the difference in elevation between the crest of the dam and the normal reservoir water level as fixed by design requirements). To correct for this, the existing emergency spillway would be widened and raised 10 feet as recommended by the Corps Dam Safety Assurance Program (DSAP; Corps 2011). This would enable the lake to safely store water from a flood event with a 1% ACE (the "100-year flood"). This will reduce the 100-year flood flow

through the spillway from approximately 4,700 to 0 cfs, which would eliminate downstream channel capacity issues during such an event.

Objectives

In accordance with CEQA Guidelines Section 15124(b), the following are the Lower Tule River Irrigation District's Project objectives:

- Provide increased flood protection to urban and agricultural areas.
- Provide increased storage for Tule River irrigation water, incidental to the flood control objective.
- Enhance storage space for sediment in Lake Success.
- Provide increased recreational opportunities within the basin.

The following are Southern California Edison's Project objectives as they pertain to utility infrastructure associated with the Project:

- Provide safe and reliable electrical service.
- Address steel tower corrosion of Magunden-Springville No. 1 and No. 2 220-kV Transmission Lines.
- Address existing 12-kV distribution facilities that will be affected by the rise in lake levels.
- Address both General Order (G.O.) 95 and USACE Regulation 1110-2-4401 conductor clearance requirements for the Magunden-Springville No.1 and No.2 220-kV Transmission Lines.
- Comply with all applicable reliability-planning criteria required by North American Electric Reliability Corporation, Western Electricity Coordinating Council, and the California Independent System Operator.
- Meet Project needs while minimizing environmental impacts.
- Design and construct the Project in conformance with SCE's approved engineering, design, and construction standards for substation, transmission, subtransmission, and distribution system projects.

Proposed Project Alternatives and Environmentally Superior Alternative

The following alternatives are described and evaluated in Chapter 4 of this EIR and are summarized below.

Lead Agency Alternatives Rejected

According to the CEQA Guidelines, two primary provisions are necessary for an adequate alternative site analysis – feasibility and location. The EIR should consider alternate project locations if a significant project impact could be avoided or substantially lessened by moving the project to an alternate site. An alternative site for the proposed Project would not be feasible because the Project consists of providing improved flood protection design and increasing the water storage capacity of Lake Success. The Project is, by definition, located in and around Lake Success. Since the Project consists of improvements to a specific area, an alternative location for this Project is not feasible. A discussion of an infeasible alternative site would not meet the "rule of reason" under CEQA and an Alternative Project Location was eliminated from further consideration in this EIR.

SCE Alternatives Rejected

SCE considered several non-transmission alternative concepts such as distributed generation (generating renewable power to offset peak loading and improve reliability), energy efficiency and conservation (increase energy efficiency and conservation to reduce system loading and demand for power), and demand response (reduce demand/electricity during periods of peak energy use). These non-transmission alternative concepts were eliminated and not considered further as they do not meet the following SCE Proposed Project objectives:

- Would not address existing steel tower corrosion of Magunden-Springville No. 1 and No. 2 220-kilovolt (kV) Transmission Lines.
- Would not meet G.O. 95 or USACE Regulation 1110-2-4401 clearance requirements.

<u>Lead Agency Alternatives</u>

- Alternatve 1 – No Project Alternative
- Alternative 2 – Alternate Gross Pool Elevation Raise

SCE (Utility Modification) Alternatives

- Alternatve 1 – No Project (No Utility Modifications) Alternative
- Alternative 2 – Earthen Berm (Transmission Line Structures) Alternative

Lead Agency Alternative 1 - No Project Alternative

CEQA Section 15126.6(e) requires the discussion of the No Project Alternative "to allow decision makers to compare the impacts of approving the proposed Project with the impacts of not approving the proposed project." The No Project scenario in this case means that the Federal Government would take no action toward implementing a flood control project or increasing the water storage capacity of Lake Success. No additional flood control projects would be built in the area and the flood threat would increase in the Porterville area (presently at a 1 in 14 chance of flooding to agricultural areas and about a 1 in 50 chance of flooding to the City of Porterville), area downstream of Porterville to the Tulare lakebed, and the Tulare lakebed. Future population trends, land use, and urban growth would continue generally as identified in current local plans. The cities and counties would continue to participate in the National Flood Insurance Program (NFIP) and would require developers/homebuilders to flood proof future developments within the 100 year flood plains elevation. Sediment accumulation into Lake Success would continue to encroach on storage capacity and would diminish the level of flood control protection afforded to areas downstream of the Richard L. Schafer Dam. The loss of flood control storage space would also adversely impact the fishery and recreation use at Lake Success from late summer through the winter. Irrigation water storage at Lake Success would also be diminished.

Under the No Project Alternative, there would be no changes to any of the existing environmental conditions and there would either be no impact, or similar impact (to the proposed Project) to each of the 20 CEQA Checklist evaluation topics, with the exception of Impact Section 3.10 – Hyrdology and Water Quality and Section 3.16 – Recreation, both of which would have greater impacts than the proposed Project. The No Project Alternative by definition would not meet the objectives of the proposed Project.

SCE Alternative 1 - No Project (No Utility Modifications) Alternative

Under the SCE No Project (No Utility Modifications) Alternative, no modification of the existing transmission lines and related facilities would occur. Therefore, the SCE No Project Alternative would not meet any of the Proposed Project's objectives.

Lead Agency Alternative 2 - Alternate Gross Pool Elevation Raise

Three different enlargement sizes for Lake Success were evaluated in this alternative. These sizes are 4-foot, 10-foot, and 20-foot gross pool raises. An effective way to increase storage at Lake Success would be to raise the height of the spillway sill by constructing a concrete ogee across the existing sill (and widen the spillway to safely pass the Probable Maximum Flood).

A 4-foot raise in the spillway was studied because it could be constructed without having to widen the spillway using pre-1996 PMF flood criteria. The 10-foot raise was an intermediate size that was selected without requiring costly relocation to Highway 190 (the spillway would require widening from 200 feet to 365 feet). The 20-foot increase was selected for investigation because it was about as large an increase that could be made without extensive modifications to the dam. The three alternative gross pool elevations were evaluated that resulted in increased storage capacities and new overall reservoir capacities.

Under CEQA, a feasible alternative must result in a reduction of environmental impacts as compared to the Project. Since a 20-foot raise would increase the severity of impacts as compared to the 10-foot raise (proposed Project), it is not environmentally evaluated herein. The 4-foot raise would result in slightly less (or similar) environmental impacts as compared to the proposed Project.

SCE Alternative 2 – Earthen Berm (Transmission Line Structures) Alternative

Transmission Line Route Alternative 2 would remove and replace approximately 2 miles of the existing Magunden-Springville No. 1 and 2 220-kV Transmission Lines within the existing ROW. However, the Berm Alternative proposes construction of two segments of earthen berm along the transmission line. This alternative would require additional ROW to accommodate the earthen berm slope. The Berm Alternative would meet the Project objectives by placing the transmission line structures completely out of the water, allowing access year-round, and preventing direct contact with the structures; however, it would have greater environmental impacts and financial cost.

<u>Environmentally Superior Alternative</u>

Based on a review of the alternatives evaluated in this chapter, the No Project Alternative would result in the fewest impacts on the environment. However, the No Project Alternative would not meet the Project objectives.

Apart from the No Project Alternative, the the 4-foot Gross Pool Elevation Raise Alternative would be the Environmentally Superior Alternative because it would result in less adverse

physical impacts to the environment with regard to most environmental topics. However, in the 1999 FEIS/FEIR, the Corps evaluated the three reservoir enlargement sizes based on cost, flood protection, irrigation water supply and hyrdo power generation. The 10-foot raise (proposed Project) was selected because it is the plan that reasonably maximizes national economic development benefits and is the Federally supportable plan.

After this full, substantial, and deliberate analysis, the proposed Project remains the preferred alternative.

Areas of Controversy

During the drafting of the Proposed Project and this EIR, public agencies and members of the public were invited to provide feedback on the documents. No comments were made at the public meetings on the Proposed Project and no responses were received to the Notice of Preparation. As such, no topics have been identified as areas of controversy.

Impacts Summary

Table ES-1: Summary of Impacts and Mitigation Measures presents the summary of the significant impacts of the proposed Project identified in this SEIR and the proposed Project mitigation measures that reduce these impacts to less than significant. Detailed discussions of the impacts and proposed policies or mitigation measures that would reduce impacts are in Chapter 3.

Table ES-1: Summary of Impacts and Mitigation Measures

Impact	Mitigation Measures	Significance before Mitigation	Significance after Mitigation
3.1 – Aesthetics			
3.1-a Have a substantial adverse effect on a scenic vista?		Less than significant	N/A
3.1-b Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?		Less than significant	N/A
3.1-c Substantially degrade the existing visual character or		Less than significant	N/A

Impact	Mitigation Measures	Significance before Mitigation	Significance after Mitigation
quality of public views of the site and its surroundings? If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?			
3.1-d Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?		Less than significant	N/A
Cumulative Impacts		Less than significant	N/A
3.2 – Agricultural Resources			
3.2-a Convert Prime Farmland, Unique Farmland, or Farmland of statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?		Less than significant	N/A
3.2-b Conflict with existing zoning for agricultural use, or a Williamson Act contract?		Less than significant	N/A
3.2-c Conflict with existing zoning for, or cause rezoning of, forest land as defined in Public Resources Code section 12220(g)), timberland as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?		No impact	N/A
3.2-d Result in the loss of forest land or conversion of forest land to non-forest use?		No impact	N/A
3.2-e Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?		Less than significant	N/A
Cumulative Impacts		Less than significant	N/A

Impact	Mitigation Measures	Significance before Mitigation	Significance after Mitigation
3.3 – Air Quality			
3.3-1 Conflict with or obstruct implementation of the applicable air quality plan?	AIR-1 through AIR-3	Less than significant	Less than significant
3.3-2 Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard?		Less than significant	N/A
3.3-3 Would the project expose sensitive receptors to substantial pollutant concentrations?		Less than significant	N/A
3.3-4 Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?		Less than significant	N/A
Cumulative Impacts		Less than significant	N/A
3.4 – Biological Resources			
3.4-1 Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service?	BIO-1, SCE BIO-1 through SCE BIO-9	Significant Impact	Less than significant
3.4-2 Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service?	BIO-2, SCE BIO-2, SCE BIO-3, SCE BIO-4, SCE BIO-6	Significant impact	Less than significant
3.4-3 Have a substantial adverse effect on state or federally-protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to marsh, vernal pool, coastal,	SCE BIO-2 through SCE BIO-6	Significant impact	Less than significant

Impact	Mitigation Measures	Significance before Mitigation	Significance after Mitigation
etc.) through direct removal, filling, hydrological interruption, or other means?			
3.4-4 Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery site; (e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	SCE BIO-2 through SCE BIO-4, SCE-BIO-7 through SCE BIO-9	Significant impact	Less than significant
3.4-5 Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	BIO-2, SCE BIO-4 and SCE BIO-6	Significant impact	Less than significant
3.4-6 Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?		No impact	N/A
Cumulative Impacts		Less than cumulatively considerable	Less than cumulatively considerable
3.5 – Cultural Resources			
3.5-1 Cause a substantial adverse change in the significance of a historical or archaeological resource pursuant to §15064.5?	CUL-1, SCE CUL-1 through SCE CUL-3	Significant	Less than significant
3.5-2 Disturb any human remains, including those interred outside of formal cemeteries?	SCE CUL-4	Significant	Less than significant
3.5-3 Would the project directly or indirectly destroy a unique paleontological resource or site or unique geological feature?		Less than significant	N/A
Cumulative Impacts		Less than cumulatively considerable	N/A
3.6 - Energy			
3.6-1 Would the project result in potentially significant		Less than significant	N/A

Impact	Mitigation Measures	Significance before Mitigation	Significance after Mitigation
environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?			
3.6-2 Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?		Less than significant	N/A
Cumulative Impacts		Less than cumulatively considerable	N/A
3.7 – Geology/Soils			
3.7-1 Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving: i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42. ii) Strong seismic ground shaking? iii) Seismic-related ground failure, including liquefaction? iv) Landslides?		Less than significant	N/A
3.7-2 Result in substantial soil erosion or the loss of topsoil?		Less than significant	N/A
3.7-3 Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading,		Less than significant	N/A

Impact	Mitigation Measures	Significance before Mitigation	Significance after Mitigation
subsidence, liquefaction or collapse?			
3.7-4 Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?		Less than significant	N/A
Cumulative Impacts		Less than cumulatively considerable	N/A
3.8 – Greenhouse Gas Emissions			
3.8-1 Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?		Less than significant	N/A
3.8-2 Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gasses?		Less than significant	N/A
Cumulative Impacts		Less than cumulatively considerable	N/A
3.9 – Hazards and Hazardous Materials			
3.9-1 Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? ,	HAZ-1, SCE HAZ-1, SCE HAZ-2	Less than significant	Less than significant
3.9-2 Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	HAZ-1, SCE HAZ-1, SCE HAZ-2	Less than significant	Less than significant
3.9-3 Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?		Less than significant	N/A
3.9-4 Be located on a site which is included on a list of hazardous materials sites		Less than significant	N/A

Impact		Mitigation Measures	Significance before Mitigation	Significance after Mitigation
	compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?			
3.9-5	For a project located within an airport land use pan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?		Less than significant	N/A
3.9-6	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?		Less than significant	N/A
3.9-7	Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?		Less than significant	N/A
Cumulative Impacts			Less than cumulatively considerable	N/A
3.10 – Hydrology and Water Quality				
3.10-1	Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	HYD-1	Less than significant	Less than significant
3.10-2	Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?		Less than significant	Less than significant
3.10-3	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces,	HYD-1	Less than significant	Less than significant

Impact	Mitigation Measures	Significance before Mitigation	Significance after Mitigation
in a manner which would: result in substantial erosion or siltation on- or off—site; or i. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or offsite; ii. create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or iii. impede or redirect flood flows.			
3.10-4 In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?		Less than significant	N/A
3.10-5 Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?		Less than significant	N/A
Cumulative Impacts		Less than cumulatively considerable	N/A
3.11 – Land Use and Planning			
3.11-1 Physically divide an established community?		Less than significant	N/A
3.11-2 Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?		Less than significant	N/A
Cumulative Impacts		Less than cumulatively considerable	N/A
3.12 – Mineral Resources			

Impact	Mitigation Measures	Significance before Mitigation	Significance after Mitigation
3.12-1 Would the project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state or a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?		No impact	N/A
3.12-2 Would the proejct result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?		No impact	N/A
Cumulative Impacts		No impact	N/A
3.13 - Noise			
3.13-1 Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	NOI-1 through NOI-10	Less than significant	Less than significant
3.13-2 Generation of excessive groundborne vibration or groundborne noise levels?	NOI-1 through NOI-10	Less than significant	Less than significant
3.13-3 For a project located within the vicinity of a private airstrip or an airport land use plan or, where such plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?		Less than significant	N/A
Cumulative Impacts		Less than cumulatively considerable	N/A
3.14 – Population and Housing			
3.14-1 Induce substantial unplanned population growth in an area, either directly or indirectly?		Less than significant	N/A
3.14-2 Displace substantial numbers of existing people		Less than significant	N/A

Impact	Mitigation Measures	Significance before Mitigation	Significance after Mitigation
or housing, necessitating the construction of replacement housing elsewhere?			
Cumulative Impacts		Less than cumulatively considerable	N/A
3.15 – Public Services			
3.15-1 Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for fire protection, police protection, schools, parks, or other public facilities?		Less than significant	N/A
Cumulative Impacts		Less than cumulatively considerable	N/A
3.16 - Recreation			
3.16-1 Would the project increase the use of exiting neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	REC-1, REC-2, SCE REC-1	Less than significant	Less than significant
3.16-2 Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?		Less than significant	N/A
Cumulative Impact		Less than cumulatively considerable	N/A
3.17 – Transportation/Traffic			
3.17-1 Conflict with a program plan, ordinance or policy addressing the circulation system, including transit,		Less than significant	N/A

Impact	Mitigation Measures	Significance before Mitigation	Significance after Mitigation
roadway, bicycle and pedestrian facilities?			
3.17-2 Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?		Less than significant	N/A
3.17-3 Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	TRA-1 through TRA-3	Less than significant	Less than significant
3.17-4 Result in inadequate emergency access.		Less than significant	N/A
Cumulative Impact		Less than cumulatively considerable	N/A
3.18 – Tribal Cultural Resources			
3.18-1 Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is: i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision		Less than significant	N/A

Impact	Mitigation Measures	Significance before Mitigation	Significance after Mitigation
(c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.			
Cumulative Impacts		Less than cumulatively considerable	N/A
3.19 – Utilities and Service Systems			
3.19-1 Require or result in the relocation or construction of new or expanded water, wastewater treatment, or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	UTI-1	Less than significant	Less than significant
3.19-2 Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?		Less than significant	N/A
3.19-3 Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?		Less than significant	N/A
3.19-4 Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?		Less than significant	N/A
3.19-5 Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?		Less than significant	N/A

Impact	Mitigation Measures	Significance before Mitigation	Significance after Mitigation
Cumulative Impacts		Less than cumulatively considerable	N/A
3.20 - Wildfire			
3.20-1 Would the project substantially impair an adopted emergency response plan or emergency evacuation plan?		Less than significant	N/A
3.20-2 Would the project, due to slope, prevailing winds, and other factors, exacerbate wildfire risk, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?		Less than significant	N/A
3.20-3 Would the project require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?		Less than significant	N/A
3.20-4 Would the project expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	SCE HAZ-1	Less than significant	Less than significant
Cumulative Impact		Less than cumulatively considerable	Less than cumulatively considerable

Chapter 1

INTRODUCTION

CHAPTER ONE - INTRODUCTION

1.0 Introduction

This Environmental Impact Report (EIR) has been prepared as a Supplemental EIR (SEIR or Draft SEIR) to the United States Army Corps of Engineers (Corps) Final Environmental Impact Statement/Final Environmental Impact Report (State Clearinghouse number 1999044004) for the Tule River Basin Investigation in September 1999 (1999 FEIS/FEIR). The 1999 FEIS/FEIR analyzed the potential environmental impacts associated with the implementation of the Richard L. Schafer Dam, Tule River Basin, California; Tule River Spillway Enlargement Project (Project) at Lake Success reservoir located approximately 6 miles east of Porterville in Tulare County, California. This SEIR discusses the potential environmental impacts of minor changes to the Project description as well as changes to the regulatory setting and physical environment that have occurred since the 1999 FEIS/FEIR was certified. The Lower Tule River Irrigation District (LTRID) is the Lead Agency for this SEIR pursuant to the California Environmental Quality Act (CEQA) and the CEQA Guidelines. The Corps is the federal sponsor on this Project and is preparing an Environmental Assessment for the Project in accord with the National Environmental Policy Act (NEPA).

Project History and Environmental Background

The 1999 FEIS/FEIR examined the environmental effects of an array of reasonable alternatives that would provide flood risk reduction to the area downstream of Richard L. Schafer Dam, including the City of Porterville, other urban areas, and agricultural land, along with increased upstream storage for irrigation water supply. Detailed design and construction of the authorized Project is currently being implemented in two phases. The first phase of the Project is entitled the Richard L. Schafer Dam, Tule River Basin, California; Tule River Spillway Enlargement Project, Road Realignment and Right Spillway Abutment Cut (here after referred to as Phase 1). A Draft Mitigated Negative Declaration (State Clearinghouse number 2019099084) for the Phase 1 realignment of Worth Drive/Avenue 146 and the emergency spillway right abutment cut was released for public review on September 25, 2019, and the document was adopted by LTRID on November 12, 2019.

The second phase of the Project is entitled the Richard L. Schafer Dam, Tule River Basin, California; Tule River Spillway Enlargement Project, Spillway Raise, which is the subject of this SEIR. The Project involves raising the spillway by constructing an ogee weir, Highway 190 & Frazier Dike armoring, protecting or relocating recreation facilities and modifying or relocating Southern California Edison (SCE) utility infrastructure. These activities will allow the Lake

Success reservoir to expand its water storage capacity by raising the maximum gross pool elevation by 10 feet. See Chapter Two for the full Project description.

Summary of Changes to the Project

During development of detailed designs for Phase 2, changes to the designs had the potential for additional effects to environmental resources that were not evaluated in the 1999 FEIS/FEIR. This SEIR evaluates the environmental effects of the refined spillway raise designs, including the ogee weir construction, armoring the Highway 190 bridge and Frazier Dike, recreation, and SCE transmission and distribution line modifications/relocations. It should be noted that the proposed water storage capacity increase and proposed maximum gross pool elevation is the same as what was analyzed in the 1999 FEIS/FEIR. See Chapter Two for the full Project description.

CEQA Updates Since Certification of 1999 FEIS/FEIR

As discussed herein, the Project was authorized in 1999 and the Project remains substantially the same as what was environmentally reviewed in 1999 (raising the maximum gross pool elevation by 10 feet). However, in the intervening years, several changes have been made to the CEQA Guidelines, regulatory and statutory requirements, special status species lists, as well as the environmental setting. The CEQA Guidelines Appendix G Checklist Form was updated to address the analysis and mitigation of greenhouse gas emissions (March 18, 2010) and include questions related to impacts to tribal cultural resources (September 27, 2016). On December 28, 2018, a comprehensive update to the State CEQA Guidelines became effective, which addressed legislative changes to the CEQA statute, clarified certain portions of the existing CEQA Guidelines, and updated the CEQA Guidelines to be consistent with recent court decisions, including but not limited to the incorporation of energy as new topic addressed by the CEQA Guidelines. The topic of Wildfire was also added to the 2019 CEQA Guidelines as a stand-alone topic. In addition, there have been changes to protected and/or special status species lists (e.g. Valley Elderberry Long-Horned Beetle has been removed, San Joaquin Kit Fox has been added, etc.). This SEIR addresses these changes, minor updates to other environmental topics, as well as the minor Project Description modifications.

Purpose, Scope and Legal Authority

The Lead Agency has determined that Project modifications or changed circumstances have occurred and/or new information has become available following the previous discretionary approval, and these changes trigger the need for additional environmental review. Pursuant to the State CEQA Guidelines, a Lead Agency must prepare a Subsequent EIR for a previously-

certified EIR when any of the following criteria set forth in CEQA Guidelines Section 15162(a)(1-3) would occur:

(1) Substantial changes are proposed in the project which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;

(2) Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or

(3) New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified shows any of the following:

    a. The project will have one or more significant effects not discussed in the previous EIR;

    b. Significant effects previously examined will be substantially more severe than shown in the previous EIR;

    c. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or

    d. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

However, as stated in Section 15163 of the State CEQA Guidelines, a Lead Agency may choose to prepare a Supplemental EIR when conditions that require preparation of a Subsequent EIR are met and "only minor additions or changes would be necessary to make the previous EIR adequately apply to the project in the changed situation" (Section 15163(a)(1-2)). As the proposed Project requires only minor modifications to the 1999 Project description, as described in Chapter Two, the Lead Agency determined that a Supplemental EIR is the appropriate documentation for the proposed Project. Refer to Section 1.5 – Organization and Scope for more information pertaining to the contents of the SEIR.

Documents Incorporated by Reference

As previously discussed, the proposed Project environmental impacts were evaluated in the 1999 FEIS/FEIR prepared by the U.S. Army Corps of Engineers (September 1999). That document and associated findings are herein incorporated by reference pursuant to CEQA Guidelines Section 15150 and is available for review at the Lower Tule River Irrigation District, 357 E. Olive Avenue, Tipton, CA 93272.

1.1 Purpose of an EIR

Preparation of an EIR is required by CEQA prior to approving any project that may have a significant impact on the environment. For the purposes of CEQA, the term "project" refers to the whole of an action, which has the potential for resulting in a direct physical change or a reasonably foreseeable indirect physical change in the environment (CEQA Guidelines Section 15378[a]).

This Draft SEIR has been prepared according to CEQA requirements to evaluate the potential environmental impacts associated with the implementation of the Project. The Draft SEIR also proposes mitigation measures that will offset, minimize, or otherwise avoid significant environmental impacts. This Draft SEIR has been prepared in accordance with CEQA, California Resources Code Section 21000 et seq.; the Guidelines for the California Environmental Quality Act (California Code of Regulations, Title 14, Chapter 3); and the rules, regulations, and procedures for implementing CEQA as adopted by the Lead Agency.

An EIR must disclose the expected direct and indirect environmental impacts associated with a project, including impacts that cannot be avoided, growth-inducing effects, impacts found not to be significant, and significant cumulative impacts, as well as identify mitigation measures and alternatives to the proposed project that could reduce or avoid its adverse environmental impacts. CEQA requires government agencies to consider and, where feasible, minimize environmental impacts of proposed development.

1.2 Intended Uses of the EIR

LTRID, as the Lead Agency, has prepared this SEIR to provide the public and responsible and trustee agencies with an objective analysis of the potential environmental impacts resulting from implementation of the Project. The environmental review process enables interested parties to evaluate the proposed Project in terms of its environmental consequences, to examine and recommend methods to eliminate or reduce potential adverse impacts, and to consider a reasonable range of alternatives to the Project. While CEQA requires that consideration be given

to avoiding adverse environmental effects, the Lead Agency must balance adverse environmental effects against other public objectives, such as economic and social benefits of a project, in determining whether a project should be approved.

This SEIR will be used as the primary environmental document to evaluate all subsequent planning and permitting actions associated with the Project. Subsequent actions that may be associated with the Project are identified in Chapter Two, Project Description. This SEIR may also be used by other agencies, including the California Public Utilities Commission (CPUC), which may use this SEIR to determine CEQA compliance related to SCE's utility modification/relocations that are needed to accommodate the proposed Project.

1.3 Known Responsible and Trustee Agencies

The term "Responsible Agency" includes all public agencies other than the Lead Agency that have discretionary approval power over the project or an aspect of the project (CEQA Guidelines Section 15381). For the purpose of CEQA, a "Trustee" agency has jurisdiction by law over natural resources that are held in trust for the people of the State of California (CEQA Guidelines Section 15386). The Project will require various approvals, permits, entitlements and/or coordination (e.g. air quality permits, water quality permits, CPUC approval of SCE utility improvements, etc.) from the following agencies:

Responsible Agencies

- California Public Utilities Commission
- United States Army Corps of Engineers

Trustee Agencies

- California Department of Fish & Wildlife
- United States Fish & Wildlife Service
- State of California Native American Heritage Commission

Other Public Agency Involvement

- San Joaquin Valley Air Pollution Control District
- Central Valley Regional Water Quality Control Board

1.4 Environmental Review Process

The review and certification process for the SEIR has involved, or will involve, the following general procedural steps:

Notice of Preparation

The Lead Agency circulated a Notice of Preparation (NOP) of an SEIR for the proposed Project on May 21, 2020 for a 30-day public review period to trustee and responsible agencies, the State Clearinghouse (SCH #1999044004), and the public. A scoping meeting (both virtual and in-person) was held on June 19, 2020. No public or agency comments on the NOP related to the EIR analysis were presented or submitted during the scoping meeting.

Draft SEIR

The purpose of a Supplemental EIR is to provide the additional information necessary to make the previously certified EIR adequate for the Project as modified. Accordingly, pursuant to Section 15163 of the CEQA Guidelines, the Supplemental EIR need contain only the information necessary to analyze the project modifications, changed circumstances, or new information that triggered the need for additional environmental review. Information and analysis from the 1999 FEIR/FEIS that is relevant to the analysis of the project modifications is briefly summarized or described rather than repeated. This Supplemental EIR is intended to:

- Supplement the 1999 FEIS/FEIR and address Project modifications, changed circumstances, or new information that was not known and could not have been known with the exercise of reasonable diligence at the time the prior document was certified, as required under CEQA Guidelines Section 15163;
- Address new CEQA requirements, such as greenhouse gas emissions and tribal resources;
- Address new or substantially more severe significant environmental effects related to proposed Project modifications;
- Recommend mitigation measures to avoid or lessen impacts associated with any new or substantially more severe significant environmental effects; and
- Update the impact analysis and mitigation measures where conditions have changed since the certification of the 1999 FEIS/FEIR.

An analysis was conducted to compare the proposed Project with the Project analyzed in the 1999 FEIS/FEIR in order to assess the proposed Project's consistency with the Project analyzed in the 1999 FEIS/FEIR and determine which environmental topics warranted further analysis in this Supplemental EIR (see Section 1.5 Organization and Scope).

Upon completion of the Draft SEIR, the Lead Agency will file the Notice of Completion (NOC) with the State Clearinghouse of the Governor's Office of Planning and Research and will publish/circulate the SEIR to begin the public review period.

Public Notice/Public Review

Concurrent with the NOC, the Lead Agency will provide a public notice of availability for the Draft SEIR, and invite comment from the general public, agencies, organizations, and other interested parties. Consistent with CEQA requirements, the review period for this Draft SEIR is forty-five (45) days. Public comment on the Draft SEIR will be accepted in written form. All comments or questions regarding the Draft SEIR should be addressed to:

Eric Limas, General Manager
Lower Tule River Irrigation District
357 E. Olive Avenue
Tipton, CA 93272
elimas@ltrid.org

Responses to Comments/Final EIR

Following the public review period, a Final SEIR will be prepared. The Final SEIR will respond to written comments received during the public review period and to oral comments during such review period.

Certification of the EIR/Project Consideration

LTRID will review and consider the Final SEIR. If the LTRID Board of Directors (Board) finds that the Final EIR is "adequate and complete," the Board may certify the Final SEIR in accordance with CEQA. As set forth by CEQA Guidelines Section 15151, the standards of adequacy require an EIR to provide a sufficient degree of analysis to allow decisions to be made regarding the proposed Project that intelligently take account of environmental consequences.

Upon review and consideration of the Final SEIR, the LTRID Board may take action to approve, revise, or reject the Project. A decision to approve the proposed Project, for which this SEIR identifies significant environmental effects, must be accompanied by written findings in accordance with State CEQA Guidelines Sections 15091 and 1509 and a statement of overriding consideration made in accordance with State CEQA Guidelines Section 15093. A Mitigation Monitoring and Reporting Program (MMRP) would also be adopted in accordance with Public Resources Code Section 21081.6(a) and CEQA Guidelines Section 15097 for mitigation measures that have been incorporated into or imposed upon the Project to reduce or avoid significant effects on the environment. The Mitigation Monitoring and Reporting Program will be designed to ensure that these measures are carried out during Project implementation, in a manner that is consistent with the SEIR.

1.5 Organization and Scope

Sections 15122 through 15132 of the State CEQA Guidelines identify the content requirements for Draft and Final EIRs. An EIR must include a description of the environmental setting, an environmental impact analysis, mitigation measures, alternatives, significant irreversible environmental changes, growth-inducing impacts, and cumulative impacts. This Draft SEIR is organized in the following manner:

Executive Summary

The Executive Summary summarizes the characteristics of the proposed Project, known areas of controversy and issues to be resolved, and provides a concise summary matrix of the Project's environmental impacts and potential mitigation measures. This chapter identifies alternatives that reduce or avoid at least one significant environmental effect of the proposed Project.

Chapter 1.0 – Introduction

Chapter 1.0 briefly describes the proposed Project, the purpose of the environmental evaluation, identifies the lead, trustee, and responsible agencies, summarizes the process associated with preparation and certification of an EIR, identifies the scope and organization of the Draft SEIR, and summarizes the NOP.

Chapter 2.0 – Project Description

Chapter 2.0 provides a detailed description of the proposed Project, including the location, intended objectives, background information, the physical and technical characteristics, including the decisions subject to CEQA, subsequent Projects and activities, and a list of related agency action requirements.

Chapter 3.0 – Environmental Setting, Impacts and Mitigation Measures

Chapter 3.0 contains an analysis of environmental topic areas as identified below. Since this is a Supplemental EIR to the 1999 FEIS/FEIR, the SEIR need only contain the information necessary to make the previous EIR adequate for the Project as revised. As previously stated, the proposed Project requires only minor modifications to the 1999 Project description. Therefore, some of the sections in this Chapter will only contain a brief description of whether or not the Project was adequately analyzed in the 1999 FEIS/FEIR, a brief description of Project impacts related to that topic, and will reproduce the mitigation measures for the applicable topic from the 1999 FEIS/FEIR. The new or updated sections (e.g. Air Quality, Biological Resources, Greenhouse Gases, Energy, etc.) will be organized as follows:

Environmental and Regulatory Setting. A description of the existing environment as it pertains to the topical area. Regulatory Setting. A description of the regulatory environment that may be applicable to the Project.

Impacts and Mitigation Measures. Identification of the thresholds of significance by which impacts are determined, a description of Project-related impacts associated with the environmental topic, identification of appropriate mitigation measures, and a conclusion as to the significance of each impact. Cumulative impacts are also addressed at the end of each impact section. Each impact topic will contain an analysis of impacts related to the water storage capacity expansion activities and a subsection related to the SCE modification/relocation of utilities. Any applicable mitigation measures will also be separated to identify whether they are applicable to the Lead Agency (water storage capacity expansion) or SCE (modification/relocation of utilities).

The following new and/or updated environmental topics are addressed in this SEIR:

- Aesthetics
- Air Quality
- Biological Resources
- Cultural Resources
- Energy
- Greenhouse Gas Emissions
- Hydrology / Water Quality
- Noise
- Tribal Resources
- Utilities / Service Systems
- Wildfire

For the environmental impact topics that were determined to be adequately analyzed in the 1999 FEIS/FEIR, they will only contain a brief description of whether or not the Project was adequately analyzed in the 1999 FEIS/FEIR, a brief description of Project impacts related to that topic, and will reproduce the mitigation measures for the applicable topic from the 1999 FEIS/FEIR.

These topics are as follows:

- Agriculture Resources and Forestry Resources
- Geology / Soils
- Hazards and Hazardous Materials
- Land Use / Planning
- Mineral Resources
- Population / Housing
- Public Services
- Recreation
- Transportation

Chapter 4.0 – Project Alternatives

Chapter 4.0 provides a comparative analysis between the merits of the proposed Project and the selected alternatives. State CEQA Guidelines Section 15126.6 requires that an EIR describe a range of reasonable alternatives to the Project, which could feasibly attain the basic objectives of the Project and avoid and/or lessen any significant environmental effects of the Project.

Chapter 5.0 – Other CEQA-Required Topics

Chapter 5.0 evaluates and describes the following CEQA required topics: growth-inducing effects, significant and irreversible effects, significant and unavoidable impacts, substantial adverse effects on fish, wildlife, and plan species, substantial adverse effects on human beings, and effects not found to be significant.

Chapter 6.0 – Report Preparers

Chapter 6.0 lists all authors and agencies that assisted in the preparation of the Draft SEIR, by name, title, and company or agency affiliation.

Appendices

This section includes the 1999 FEIS/FEIR, the Project NOP and technical studies.

1.6 – Summary of Comments Received on the Notice of Preparation

One NOP comment was received pertaining to Biological Resources from the California Department of Fish & Wildlife (CDFW). The comment letter outlined CDFW's requirements for biological evaluation and provided information on potential species that could occupy the region in which the Project is located.

Chapter 2

PROJECT DESCRIPTION

CHAPTER TWO – PROJECT DESCRIPTION

Project Title: Richard L. Schafer Dam, Tule River Basin, California; Tule River Spillway Enlargement Project

Lead Agency: Lower Tule River Irrigation District

Federal Sponsor: United State Army Corps of Engineers

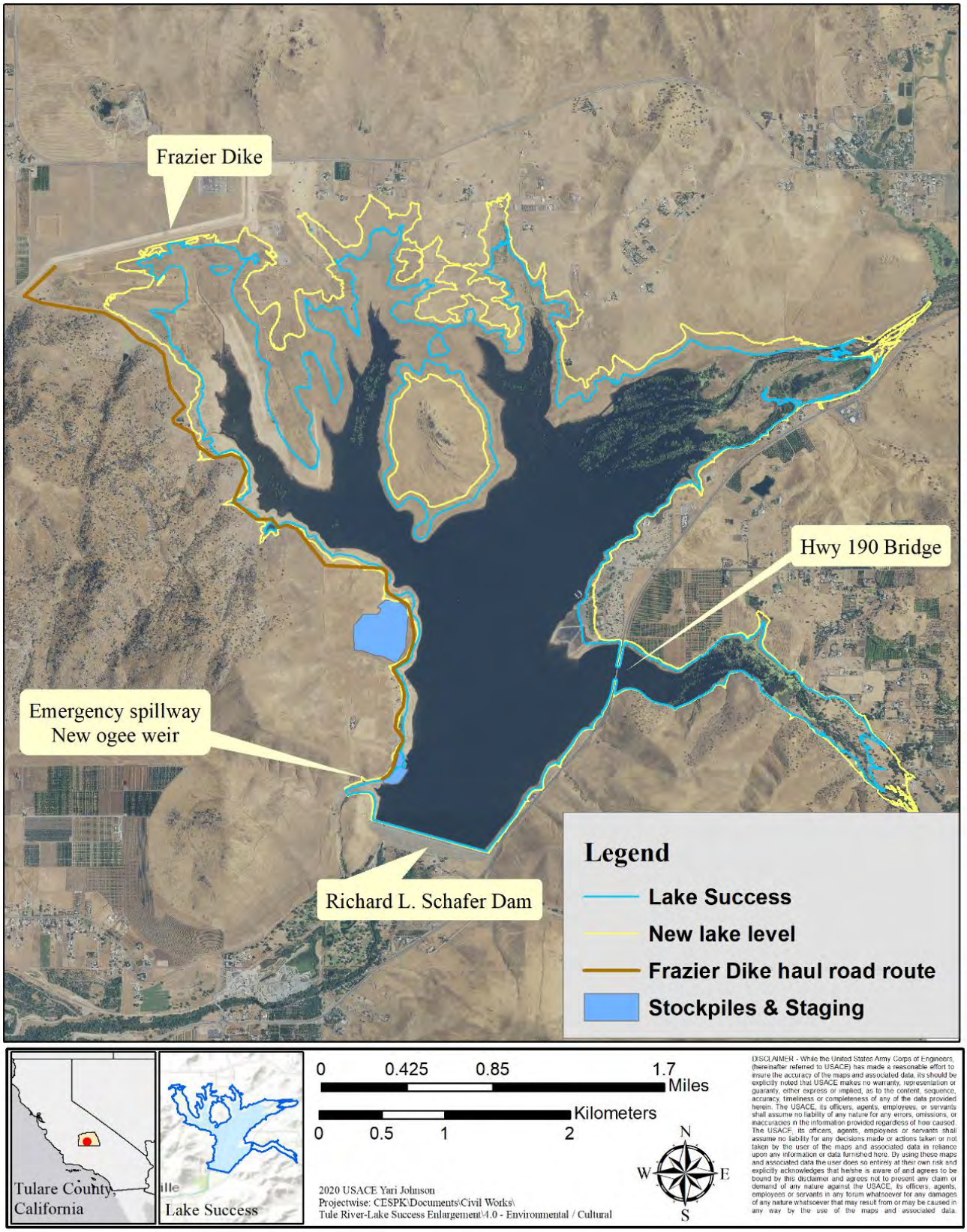
2.1 Environmental Background

The United States Army Corps of Engineers (Corps) completed a Feasibility Study and a Final Environmental Impact Statement/Final Environmental Impact Report (FEIS/FEIR) for the Tule River Basin Investigation in September 1999 (State Clearinghouse number 1999044004). The 1999 FEIS/FEIR examined the environmental effects of an array of reasonable alternatives that would provide flood risk reduction to the area downstream of Richard L. Schafer Dam, including the City of Porterville, other urban areas, and agricultural land, along with increased upstream storage for irrigation water supply. The Project was authorized in 1999, however, in the intervening years, several changes have been made to the CEQA Guidelines, regulatory and statutory requirements, special status species lists, as well as the environmental setting. In addition, minor Project description changes have been made, although the Project remains substantially the same as what was analyzed in 1999. To address these changes, this Supplemental EIR has been prepared.

2.2 Project Location

The Richard L. Schafer Dam and Lake Success reservoir are located on the main branch of the Tule River about 6 miles east of the City of Porterville in Tulare County, California, within the foothills of the Sierra Nevada, 50 miles north of Bakersfield and 60 miles southeast of Fresno. The Tule River drains about 390 square miles into Lake Success. It then flows from the reservoir through the City of Porterville and continues for 25 miles through agricultural areas before being completely diverted into irrigation canals. Figure 2-1 displays the Lake Success area and some of the features of the proposed action.

Figure 2-1: Overview of Lake Success With Current and Proposed Lake Levels



2.3 Overview of Lake Success / Richard L. Schafer Dam

Lake Success and the Richard L. Schafer Dam is a multi-purpose facility that provides flood damage reduction benefits, irrigation water storage, recreation, and electrical power generation. Construction of the dam was completed in May 1961. The dam provides flood damage reduction benefits to the City of Porterville (population 60,070 in 2020) and to other communities downstream. In addition, the dam helps protect several hundred thousand acres of valuable farmland in the Tulare Lakebed from damaging winter and spring floods. It is part of a system of dams and reservoirs providing flood protection to the Tulare Lakebed and adjacent areas from streams flowing westward out of the Sierra Nevada range. The other dams in this system are Pine Flat Dam on the Kings River, Terminus Dam on the Kaweah River, and Isabella Dam on the Kern River, all operated by the Corps. The Tulare Lakebed is a natural lakebed that had largely dried out by the late 1890s due to upstream water diversions. Since then, it has become a valuable farming region. The Tulare Lakebed has no outlet to the ocean and consists of heavy clay soils; therefore, all floodwater entering the lakebed remains until it evaporates or is consumed for irrigation.

2.4 Summary of Project Description from 1999 FEIS/FEIR

The Project description from the 1999 FEIS/FEIR is summarized as follows[1]:

The Project consists of constructing a 10 foot-high concrete ogee weir across the spillway, raising the gross pool elevation from 652.5 feet to 662.5 feet M.S.L., and widening the spillway to 365 feet to safely pass the probable maximum flood (PMF) with the minimum 4.3 feet of freeboard below the dam crest. The concrete ogee weir would be constructed over the existing broad crested sill. Reservoir storage capacity would increase from 82,300 to 110,300 acre-feet (28,000 acre-feet), and reservoir surface area from 2,400 acres to 3,120 acres. The gross pool would be used jointly for flood control and agricultural water supply storage. The Project is supported by the non-Federal sponsor (LTRID).

The spillway raise would add 28,000 acre-feet of flood control storage at Lake Success that would be jointly used for irrigation water storage. The Project would reduce flood potential for the City of Porterville from a 1 in 50 chance to about a 1 in 100 chance in any given year. Flooding in the nearby agricultural areas would also be minimized along the Tule River, and there would be a decrease in the flood volume, duration, and area flooded in the Tulare Lakebed. Upon Project

[1] 1999 Final Feasibility Report and Final EIS/EIR (U.S. Army Corps of Engineers), pages 5-1 and 5-2.

completion, the Tulare Lakebed would continue to experience intermittent flooding due to incoming flows from the Kings River, Kaweah River, and Tule River, and local drainages.

1999 FEIS/FEIR Components:

- The spillway sill at Success Dam would be raised 10 feet and widened from 200 to 365 feet.
- 10-foot high concrete ogee weir would be placed over the existing spillway sill.
- Raised gross pool would add 28,000 acre-feet of joint-use flood control and irrigation water storage space in the reservoir, increasing the storage capacity from 82,300 to 110,300 acre-feet.
- Reservoir surface area would increase from 2,400 to 3,120 acres.
- To mitigate for recreation losses and maintain facilities for public and safety, two eight fixture restrooms at the Tule Recreation Area and one eight fixture restroom at the Rocky Hill Recreation Area would be flood protected to either protect in-place (earth berm) or allow periodic flooding and refurbishing when the gross pool receded. Temporary portable restroom facilities would be rented when restrooms are inundated. The upper boat ramp at Tule recreation area would be widened and extended to an elevation of 667 feet M.S.L. An existing parking area would be enlarged to replace parking area lost to higher gross pool levels. The existing well and storage tank at the Tule Recreation Area would be protected in-place by an earth berm The well, storage tank, and metal shed in the Rocky Hill Recreation Area would be relocated to higher ground. All other facilities would be allowed to inundate.
- Four (4) dwellings would be acquired in fee and removed. Thirty (30) ownerships would be acquired in fee.
- Recreation use (land) at the Tule Recreation Area and Rocky Hill Recreation Area would decrease approximately 1 percent as a result of the raised pool condition.
- The State Highway 190 bridge would be protected in-place (rock protection of road approaches) and allowed to be partially inundated periodically. The bridge would be inspected and cleaned by the local sponsor after each inundation.
- Fourteen (14) transmission towers and 11,800 feet of power lines must be raised to meet minimum clearance criteria.
- 3,500 feet of Frazier Dike slope would require rock protection as a result of the raised pool condition.

Refer to Section 2.6 - *Comparison of 1999 and Proposed Project Descriptions* for a summary of changes between the 1999 Project description and the current proposed Project description.

2.5 Proposed Project Description

Project Purpose and Need

Currently, flooding downstream of the Richard L. Shafer Dam can cause extensive damage to residences, agricultural farmland, and public facilities. Under current operations of the existing dam, releases greater than 3,200 cfs have caused damage to downstream agricultural areas. The downstream channel capacity ranges from 10,000 cfs through the City of Porterville to as little as 3,200 cfs west of the city. Agricultural lands west of the city are where property damage and danger to residents have historically occurred, given a release greater than 3,200 cfs (Corps 2011). The existing dam controls downstream flows by making releases through its outlet works. When the reservoir elevation exceeds the emergency spillway crest elevation (currently 655.1 feet, NAVD88), uncontrolled flows are released into the downstream channel. The existing spillway crest elevation corresponds to a flood event with a 2.2% annual chance exceedance (ACE) (approximately, the "46-year flood"). Thus, the current emergency spillway is undersized and not capable of passing the PMF within present freeboard requirements (freeboard is the difference in elevation between the crest of the dam and the normal reservoir water level as fixed by design requirements). To correct for this, the existing emergency spillway would be widened and raised 10 feet as recommended by the Corps Dam Safety Assurance Program (DSAP; Corps 2011). This would enable the lake to safely store water from a flood event with a 1% ACE (the "100-year flood"). This will reduce the 100-year flood flow through the spillway from approximately 4,700 to 0 cfs, which would eliminate downstream channel capacity issues during such an event.

Authority

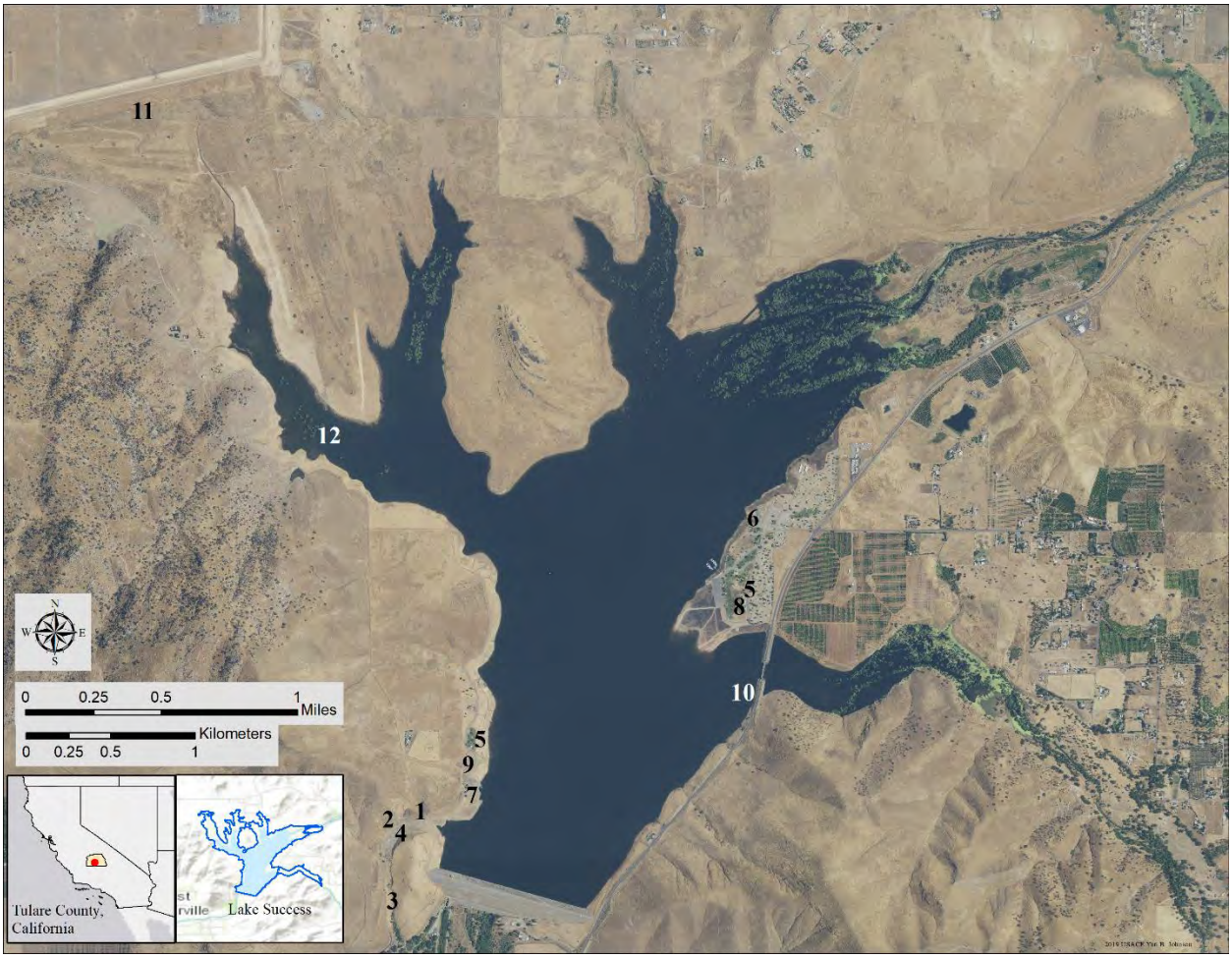
Authorization for construction of the Tule River Spillway Enlargement Project at Lake Success is provided by the Water Resources Development Act of 1999 Section 101 (b)(4) (Public Law 106-53, 17 August 1999), which authorized the flood damage reduction and water supply Project based on the recommendations of the final report of the Chief of Engineers.

Proposed Project Components/Actions

The Corps and the non-federal sponsor, LTRID (CEQA Lead Agency), are proposing to construct a 10 foot-high concrete ogee weir across the emergency spillway at Richard L. Shafer Dam, which would raise Lake Success' gross pool elevation from 655.1 feet to 665.1 feet NAVD88 (652.5 feet and 662.5 feet NGVD29, respectively). The gross pool elevation is reached when the water level in the reservoir is at the crest of the spillway and generally represents the elevation where all flood storage in the reservoir is filled (Corps 2016). Due to the increased gross pool elevation, land or flowage easements would be acquired around the lake by LTRID. The California

Highway 190 bridge that passes over the lake would be armored with additional rock revetment and rock slope protection would be added to Frazier Dike. Several existing structures and supporting utilities at both the Rocky Hill and Tule Recreation Areas would need to be relocated or flood protected. Construction also consists of replacing and raising fifteen (15) Southern California Edison (SCE) transmission towers with fourteen (14) new H-frame hybrid structures and reconductoring approximately two miles of transmission lines to meet minimum clearance criteria resulting from the increased gross pool and removing/relocating approximately three miles of distribution facilities due to the rise in lake elevation. Figure 2-2 provides an overview of Lake Success with components of the Proposed Actions numbered (Note: the overview of SCE components are provided in Figures 2-14 through 2-16). Phase 1 covered (1) widening the emergency spillway from 200 feet to 365 feet, (2) relocating the existing road, Worth Drive/Avenue 146, through the spillway to the new road bench constructed as part of the spillway widening, and (3) restoring the lower third of the spillway to its original design grade using excavated material from the spillway widening. Phase 2 would include (4) constructing a 10-foot high concrete ogee weir over the existing spillway sill, (5) flood-proofing restrooms at the Tule and Rocky Hill recreation areas, (6) extending and widening the Tule Recreation Area boat ramp, (7) enlarging parking capacity at Rocky Hill Recreation Area to replace parking areas lost during higher gross pool levels, (8) protecting in place the Tule Recreation Area well and storage tank by an earthen berm, (9) relocating the Rocky Hill Recreation Area storage tank, well, and metal shed to higher ground, (10) placing rock revetment along the State Highway 190 bridge abutments for erosion protection, (11) placing rock revetment (approximately 2,500 linear feet) along Frazier Dike for erosion protection, and (12) replacing and raising fifteen transmission towers with fourteen new H-frame hybrid structures reconductoring approximately two miles of transmission lines to meet minimum clearance criteria and removing/relocating approximately three miles of distribution facilities due to the rise in lake elevation.

Figure 2-2: Overview of Lake Success With Components of Proposed Actions Numbered



Individual Project components are described in more detail as follows:

Concrete Ogee Weir

Raising the emergency spillway would be achieved by constructing a 10-foot tall concrete ogee weir (Figure 2-3). The crest of the ogee weir would match the new gross pool elevation (665.1 feet NAVD88). To construct the ogee weir, the existing emergency spillway would be excavated about 8.5 feet to a maximum depth of 648 feet (NAVD88) elevation. Self-leveling concrete would be poured to create the base for the ogee weir (Figure 2-4). A concrete apron would extend almost 150 feet downstream from the bottom crest of the ogee weir. A 2.5-foot thick concrete wall would extend 50 feet upstream and downstream on either side from the ogee weir, except for the left downstream side which would extend 93 feet beyond the ogee weir. The wall would have a maximum height of 688 feet elevation (NAVD88) on both the left and right side of the spillway

Figure 2-3 shows the configuration of the 10-fot tall concrete ogee weir across the widened emergency spillway. The concrete wall elevations shown in the Figure are: R2=670'; R3, R4=688'; R5=678'; L2=670'; L3, L4=688'; and L5=678'. Downstream concrete apron extent: line connecting R1 and L1 from the ogee. The standard radius of the curvature = 180'.

Figure 2-3: Configuration of Concrete Weir

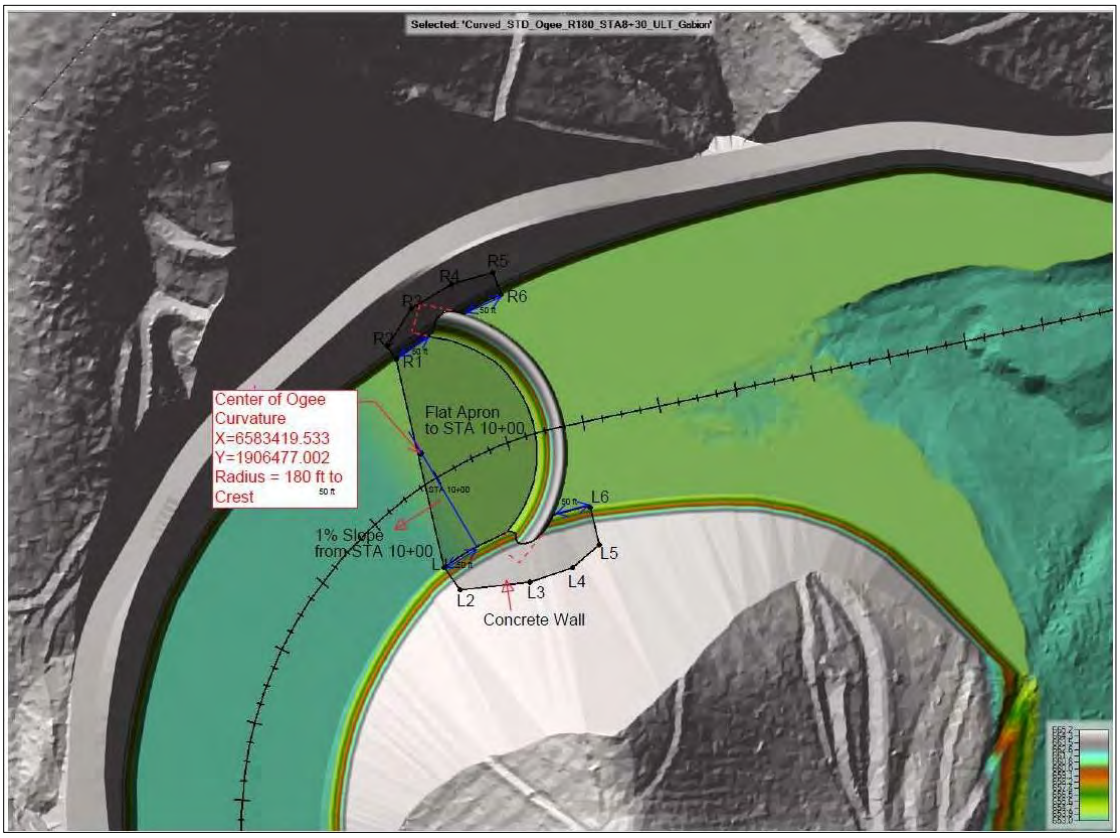
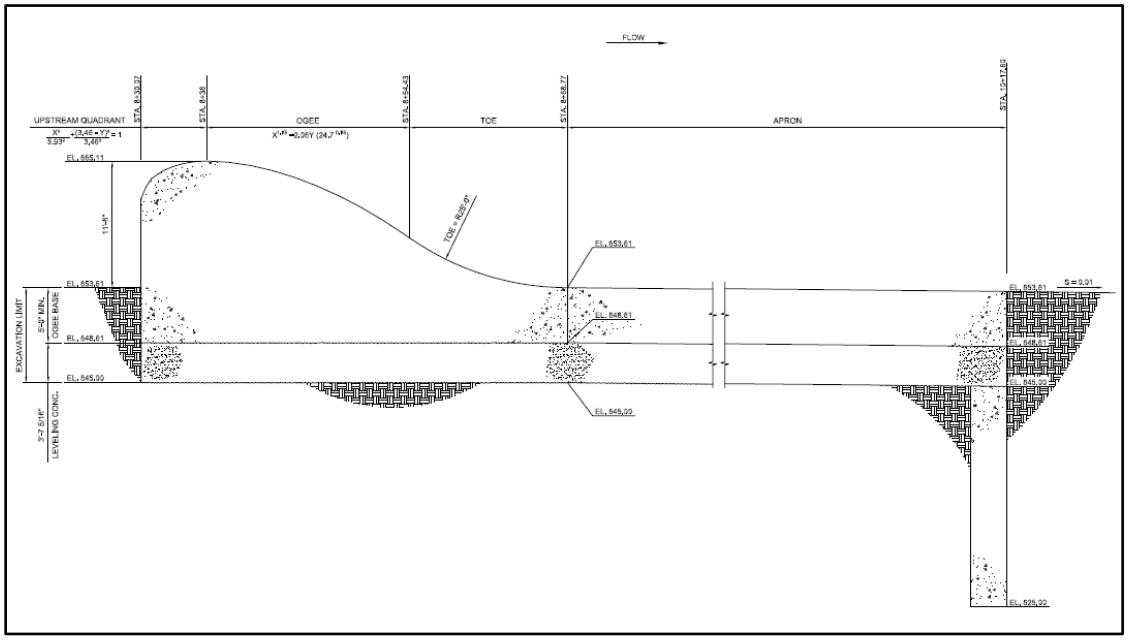


Figure 2-4: Side View Cross-Section of the Ogee Weir With Downstream Apron



Increase in Water Storage Capacity

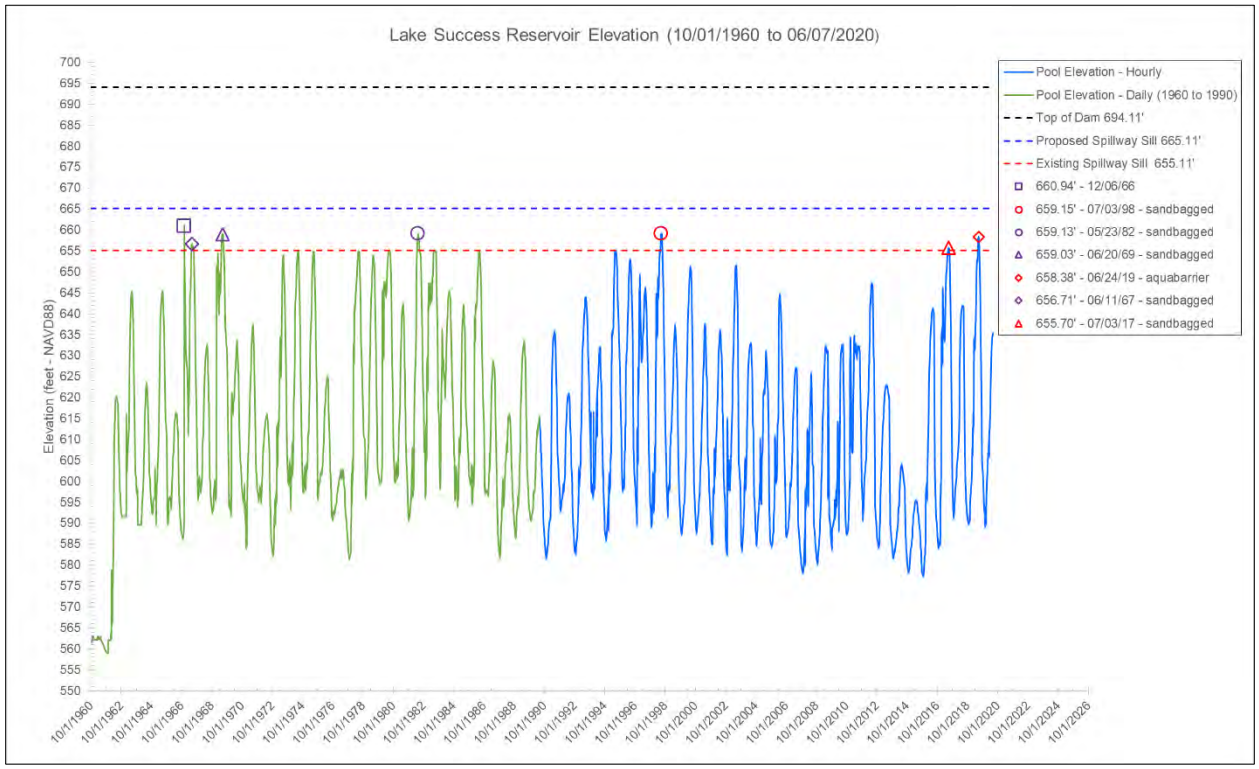
Raising the gross pool would add 28,000 acre-feet of joint-use flood control and irrigation water storage space in the reservoir, increasing storage capacity from 82,300 to 110,300 acre-feet (Corps 1999). The reservoir surface area would increase from 2,400 to 3,120 acres. The greater storage capacity would increase the level of protection from one event in 46 years to one flood event in approximately 100 years for downstream communities. Recreation would increase in the months of August and September during the years when there is more water stored in the reservoir, which would depend on regional precipitation patterns. There would be short-term loss of parking areas during periods of inundation. The Corps would create a new road base (gravel) parking area at Rocky Hill Recreation Area to offset parking lost during these periods of higher gross pool levels (denoted by the 6 shown on Figure 2-2).

The existing maximum lake level (aka gross pool elevation) has been passed seven times since the dam was constructed in 1961: 1966, 1967, 1969, 1982, 1998, 2017, and 2019 (Figure 2-5). After the 1966 event, a barrier has been used to prevent high waters from going through the spillway to reduce downstream flooding. The barrier, typically sandbagging, allowed water levels to be above the current gross pool elevation of 655.1 ft NAVD88 (652.5 NGVD29) from 25 to 58 days, with an average of 46 days (Figure 2-5). All six of these high water events occurred in the summer. The proposed ogee weir serves as a permanent replacement to these barriers. With the proposed spillway raise, there is less than a 1% chance each year that water will flood up to the new gross pool elevation of 665.1ft NAVD88 (662.5 NGVD29). Therefore, increasing the maximum lake

level by 10 feet does not represent a permanent inundation. Based on the last 60 years of hydrologic data for Lake Success, it would be an infrequent inundation lasting less than two months, about once every eight years (Figure 2-5). In Figure 2-5, the red dashed horizontal line represents the current spillway height (665.1 ft NAVD88; 652.5 ft NGVD29), while the blue dashed line represents the proposed spillway height (665.1 ft NAVD88; 662.5 ft NGVD29). After the emergency spillway was first used in December 1966 during flooding, a barrier has been used to prevent high waters from going through the spillway. The proposed ogee weir serves as a permanent replacement to these barriers.

In summary, there would be a 12.5% chance each year that lake levels would rise above the existing gross pool elevation and less than 1% changes each year that lake levels would reach the new proposed gross pool elevation.

Figure 2-5: Lake Success Reservoir Elevation Levels Over the Last 60 Years



Land Acquisition

Due to the increased gross pool elevation, LTRID would purchase land in fee, or in a few select cases acquire flowage easements, around the lake up to approximately 668.3 feet (NAVD88) in

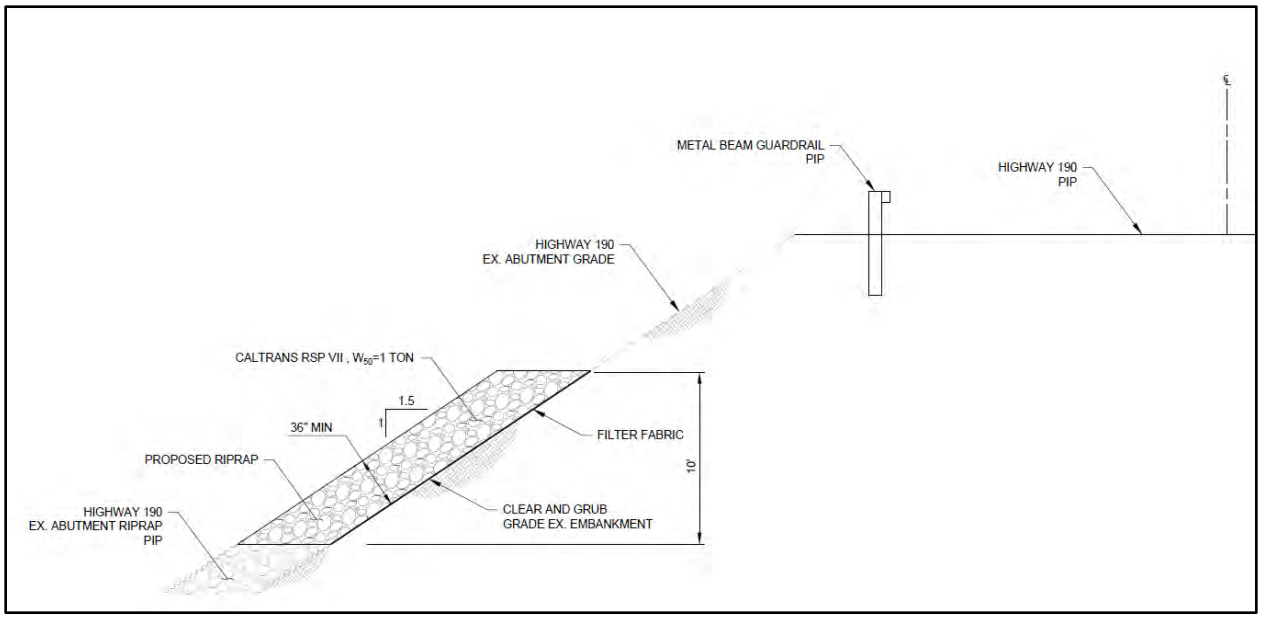
elevation. This higher elevation beyond the proposed gross pool elevation takes into account the wind and wave runup from the new, higher lake level. Wave runup is the maximum vertical extent of wave uprush on a beach or structure above the new gross pool elevation, representing the extent that water could theoretically reach. A total of 44 parcels and about 452 acres would be impacted by the proposed action. After completion of the construction for the proposed action, LTRID would transfer these lands over to the Corps for ownership, operation and maintenance.

State Highway 190 Bridge

The State Highway 190 bridge would be impacted by the increased gross pool. To accommodate for this, 10 feet of rock revetment (riprap) would be placed along the bridge abutments for erosion protection (see Figure 2-6) above the existing rock revetment. The rock revetment is required to protect the bridge abutments against wave action and would come from blasted rock created during the Phase 1 spillway widening. Approximately 3,000 linear feet of riprap, bedding, and filter material would be placed to 669 feet elevation (NAVD88). Figure 2-7 shows the typical cross-section for rock revetment (riprap) placement. There are four SCE distribution poles located on the east side of the bridge that would be relocated up the bridge abutment out of the water.

Figure 2-6: Highway 190 Rock Slope Protection

Figure 2-7: Typical Cross-Section for Riprap Placement along Highway 190 Abutment

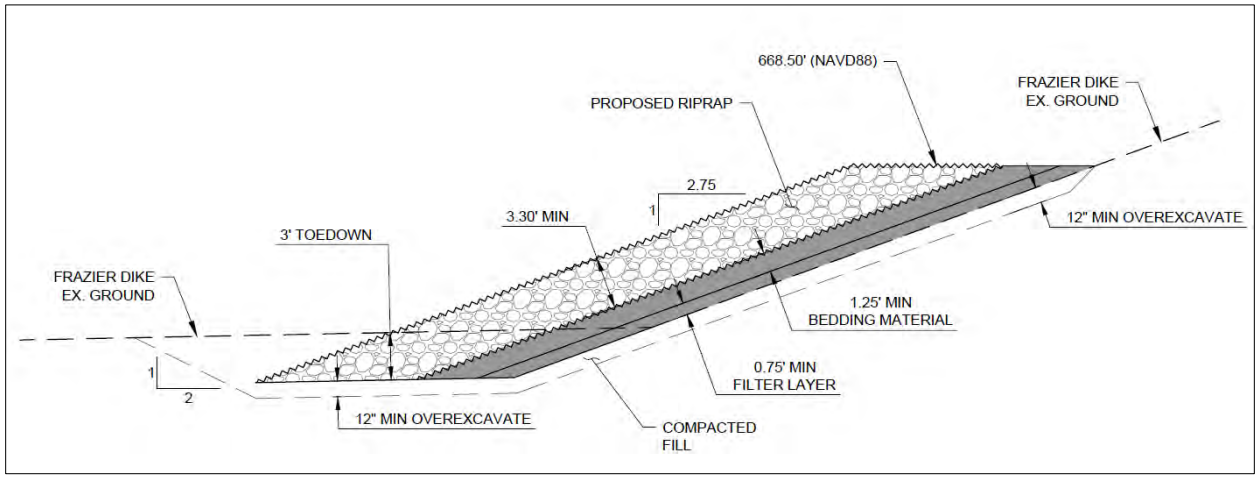


Frazier Dike

Frazier Dike was constructed to protect the valley northwest of Lake Success from flooding in case of a PMF event (Corps 1999). The dike is 7,760 feet long, extending southwest from Avenue 176. Under existing conditions, a small portion of the lakeside toe is at the current gross pool elevation (Figure 2-8). Since the new gross pool elevation is 665.1 feet (NAVD88), rock slope protection (riprap), bedding materials, and filter would be placed up to the proposed gross pool level plus wave runup, which is approximately 668.5 feet elevation (NAVD88) as shown in Figure 2-9. The rock revetment would extent roughly 13.5 feet above the current gross pool elevation and 3.5 feet above the proposed, higher gross pool elevation. This rock revetment would be composed of blast rock material created during the Phase 1 spillway widening and right abutment cut.

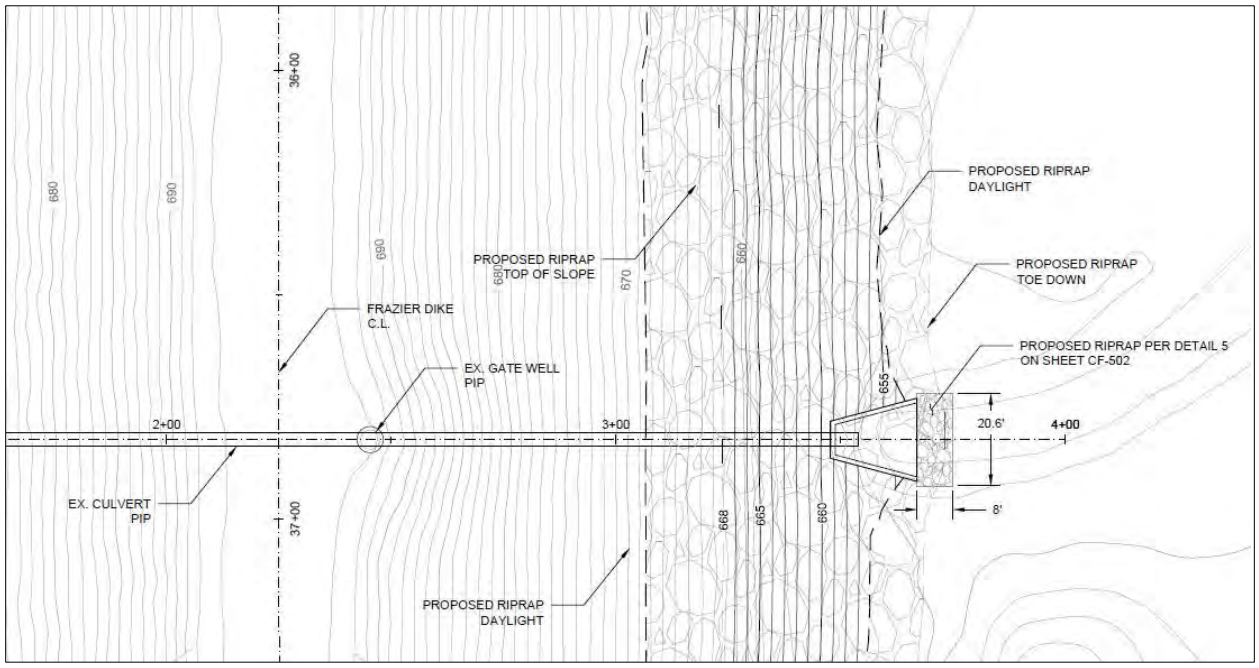
Figure 2-8: Design of Rock Revetment Placing Along Frazier Dike

Figure 2-9: Typical Cross-Section for Riprap Placement along Frazier Dike



A drainage outlet through Frazier Dike acts to drain water back into the reservoir that may pool on the landside of the dike. The outlet consists of a 250-foot long and 36-inch wide (10 gage) corrugated metal pipe (CMP) exiting at the upstream toe of the dike at an invert elevation. The existing flap gate would be replaced and up to 20 feet of the existing pipe would be cut. The end of the existing CMP would be encased by a new reinforced concrete headwall structure (Figure 2-10).

Figure 2-10: New Reinforced Concrete Headwall Structure



Recreational Facilities

Raising the gross pool causes the need for structures and supporting utilities at both the Rocky Hill and Tule Recreation Areas to be relocated or flood protected. The southern boat launching ramp at the Tule Recreation Area would not be relocated, but extended and widened, to match the existing ramp to ensure use at the new gross pool elevation. The northern parking area at the Tule Recreation Area would be expanded adjacent to the extended boat ramp to mitigate for the seasonal inundation of the southern parking lot. The expansion would be approximately 250 feet by 450 feet, providing additional space for approximately 50 automobiles and 50 automobiles with trailers. Parking at the Tule Recreation Area is presently filled to capacity during busy weekends and holidays, causing some visitors to park vehicles in a hazardous manner on the narrow shoulder of nearby state Highway 190. The replacement parking area would help alleviate this hazard.

The Corps would protect in place the existing pumphouse and storage tank at the Tule Recreational Area by building a 3.5-foot tall earthen berm (Figure 2-11). The restroom immediately west of the pumphouse would be periodically inundated by the new, higher lake levels and would be relocated further away from the water (Figure 2-12). In addition, portable toilets would be placed on higher ground when the lower elevation restroom is inundated.

Figure 2-11: Proposed 3.5-foot Tall Earthen Berm to Protect Existing Tule Recreation Area Pump house

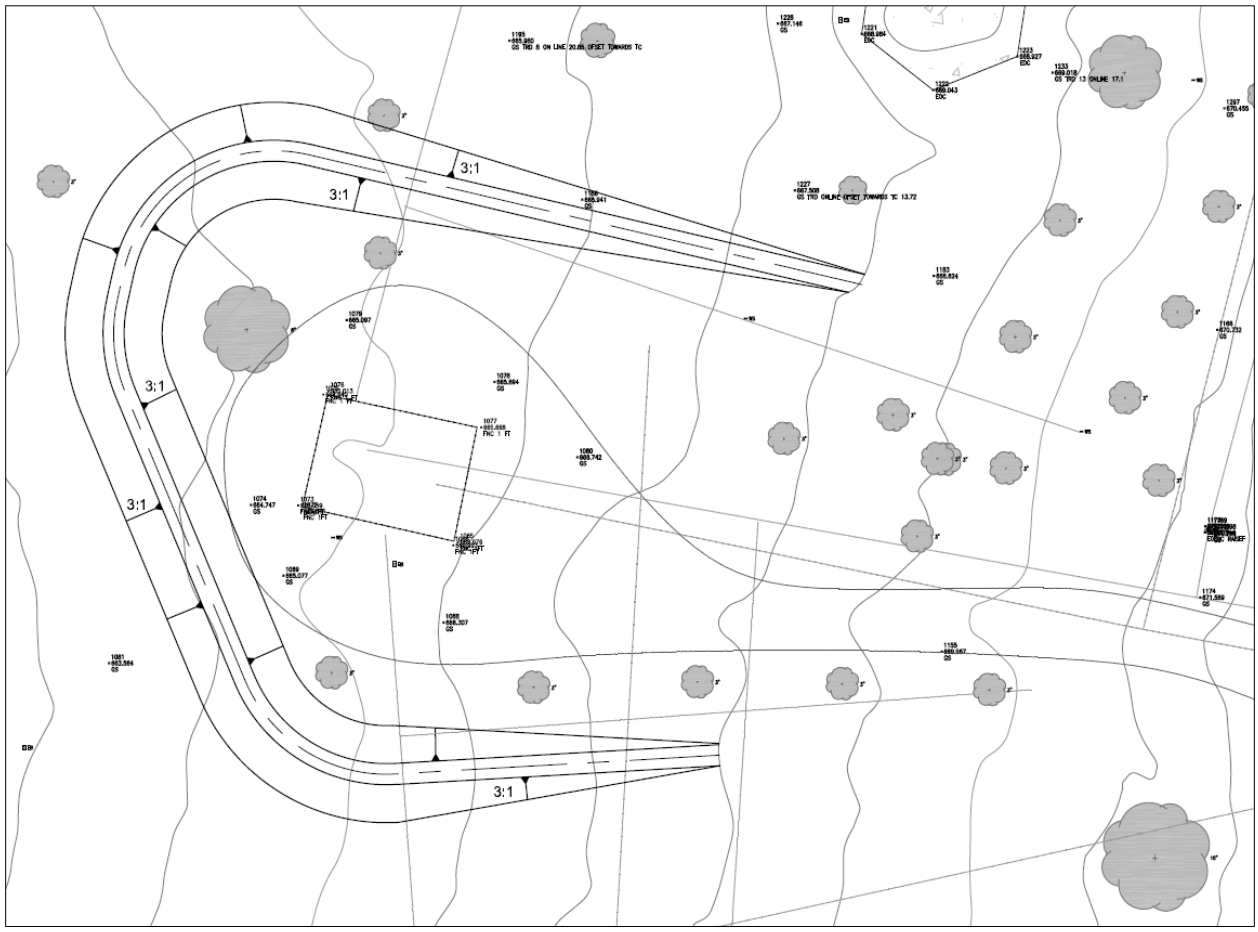
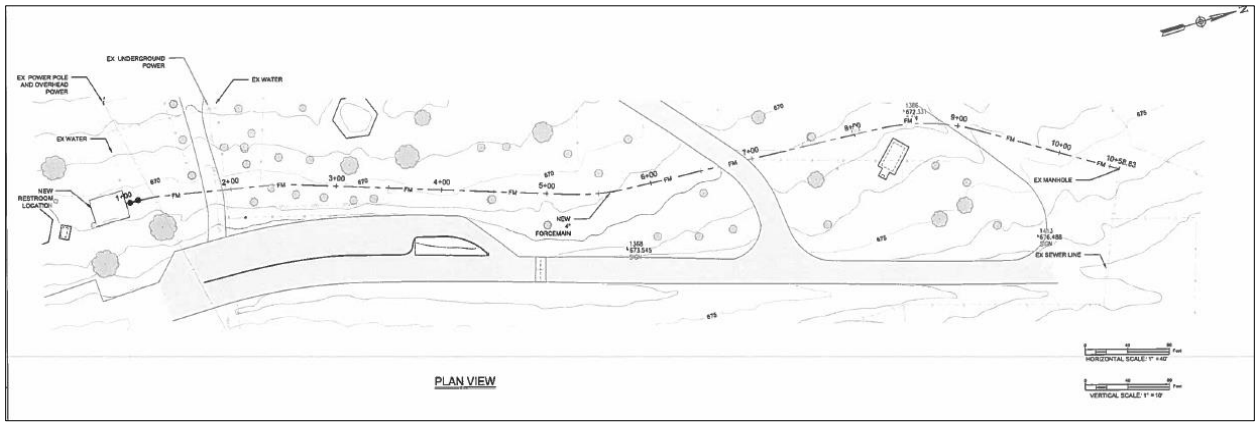
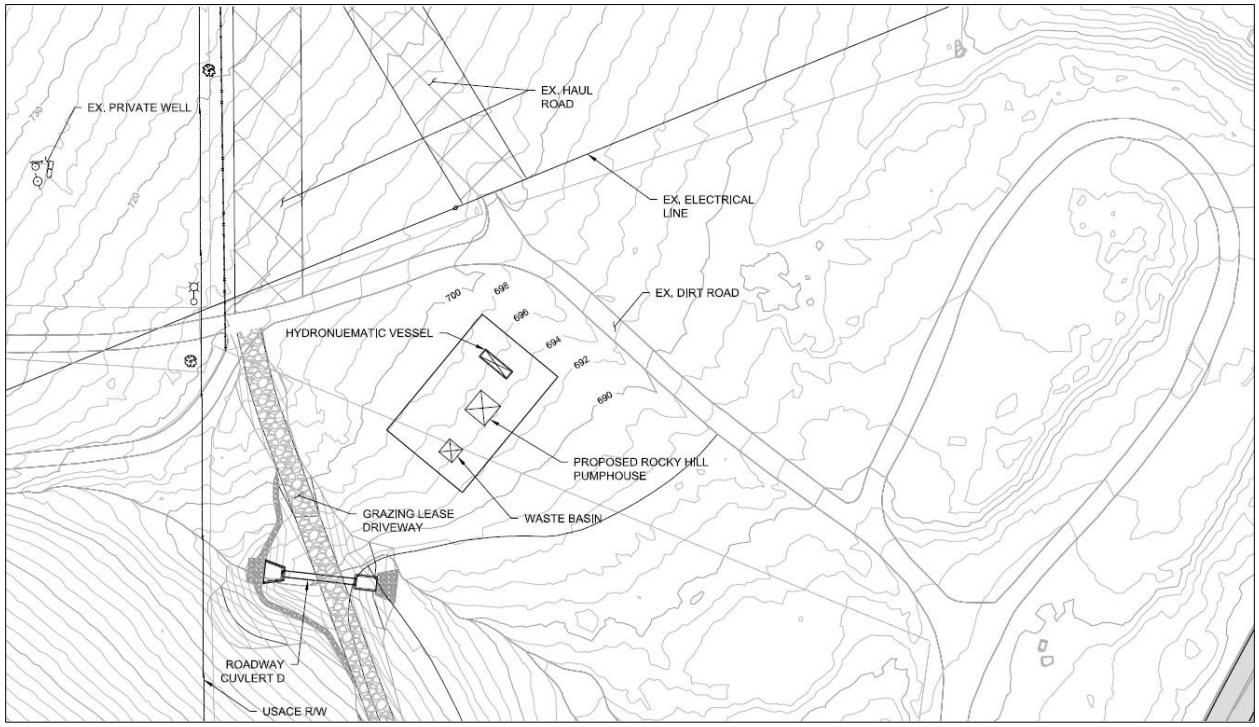


Figure 2-12: Location of New Sewer Force Main for Relocated Restroom in the Tule Recreation Area



At the Rocky Hill Recreational Area, the pumphouse, storage tank, well, metal shed and boat ramp would need to be relocated or modified to withstand the new gross pool levels. Located on the western side of Lake Success, the pumphouse, storage tank, well, and metal shed would be relocated (Figure 2-2 and 2-13) to higher elevation on Corps property. The boat launching ramp would not be relocated, but extended and widened, to match the existing ramp and ensure use at the new gross pool elevation. For access and use during higher gross pool levels, the road to Rocky Hill Recreational Area would be relocated (completed during Phase 1) and the existing parking lot would be enlarged. The existing restroom in the Rocky Hill Recreational Area would be protected in place so that it can be inundated periodically by the new gross pool and then cleaned after the pool recedes (Figure 2-2). Electrical lines needed for the restroom would be replaced as necessary. The Corps has no provisions to replace picnic areas and instead, picnicking areas would be reconditioned following seasonal flooding. A total of 30 family and six group picnic sites would be subject to seasonal inundation under the proposed action.

Figure 2-13: Location of Relocated Rocky Hill Pumphouse



SCE Transmission and Distribution Lines

Due to Corps Engineering Regulation (ER) 1110-2-4401, the SCE Magunden-Sprinville No. 1 and No. 2 transmission lines which cross over the western edge of Lake Success would have to be raised to a minimum height of 52 feet to accommodate sailboats (sometimes referred to herein as the "Lake Success Transmission Project"). SCE would replace 15 lattice steel transmission towers with 14 new, higher H-frame hybrid transmission structures (Figure 2-14). Figure 2-14 shows SCE Transmission lines (black) with 15 transmission towers (purple) that would be replaced with 14 higher-clearance transmission towers (red). This work would occur after the ogee weir construction is complete, when lake levels are low to avoid in-water work. In addition, up to 40 distribution power poles on three miles of the existing 12-kV facilities all around the Lake Success area, including the area along the Highway 190 bridge would be removed, replaced or relocated (Figure 2-15).

Figure 2-14: Location of SCE Transmission Towers Requiring Replacement

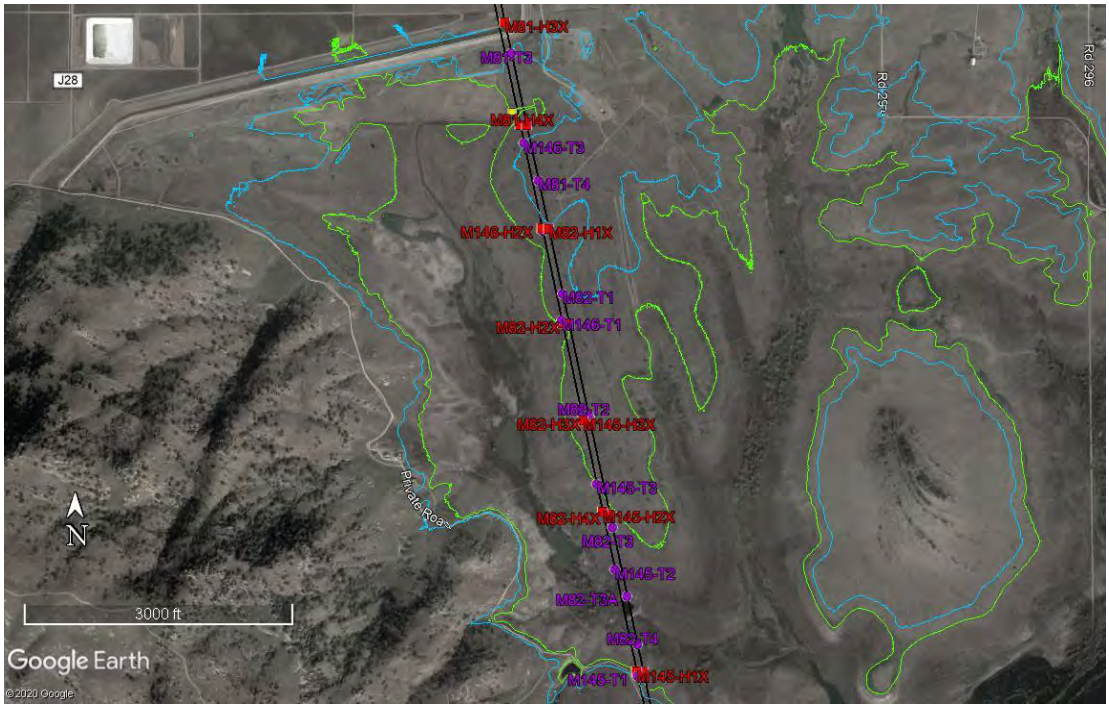
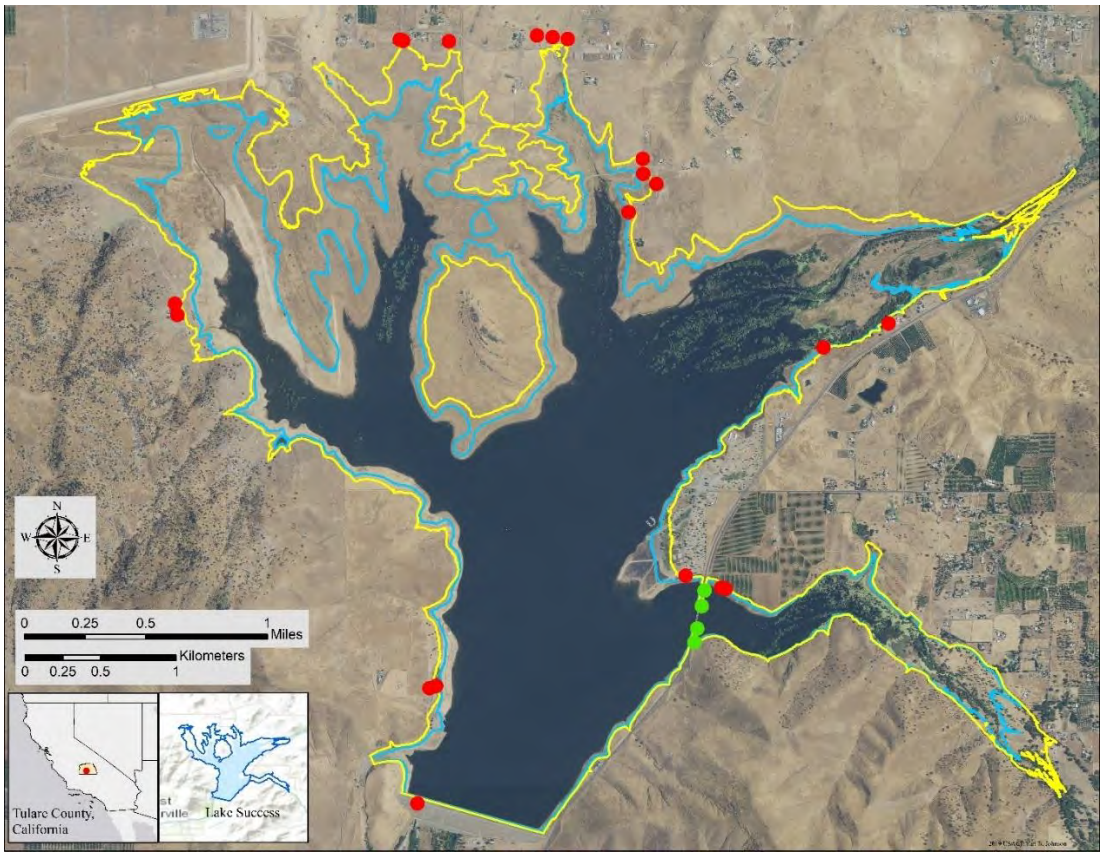


Figure 2-15: Location of SCE Distribution Poles Requiring Relocation



The Lake Success Transmission Project includes the following elements:

- Replace approximately 15 Lattice Steel Towers (LSTs) with 14 new H-frame hybrid structures ranging in height from 120 feet to 190 feet above ground.
- Reconductor approximately 2 miles of existing 1033 thousands of circular mils (kcmil) aluminum conductor steel-reinforced (ACSR) 54/7 on the Magunden-Springville No. 1 Transmission Line with approximately 2 miles of new 636 kcmil aluminum conductor steel support/trapezoidal (ACSS/TW)-HS285 Type 23 "Scoter" conductor. Additionally, reconductor approximately 2 miles of existing 605 kcmil ACSR 30/19 on the Magunden-Springville No. 2 Transmission Line with approximately 2 miles of new 605 kcmil ACSR 30/19.
- Replace approximately 2 miles of 0.5-inch Siemens-Martin steel overhead ground wire (OHGW) on the Magunden-Springville No. 1 Transmission Line with approximately 4 miles of 0.5-inch Extra High Strength OHGW (two ground wires). Additionally, replace approximately 2 miles of existing 0.5-inch High Strength Steel OHGW on the Magunden-Springville No. 2 Transmission Line with approximately 4 miles of 0.5-inch Extra High Strength OHGW (two ground wires).
- Remove, replace, and/or relocate approximately 3 miles of the existing 12-kV distribution facilities and circuitry within the Project area, including the area along SR-190 bridge.

Individual components associated with SCE's Proposed Project activities are described in further detail below.

Transmission Line

220-kV Transmission Line Description

The Proposed Project would include the removal and replacement of approximately two miles of existing 220-kV line facilities along the Magunden-Springville No. 1 and No. 2 220-kV Transmission Lines. The Proposed Project begins just south of Springville Substation and continues in a southerly direction along the existing ROW for approximately 2 miles (See Figure 2-16).

Poles/Towers

The 220-kV transmission route of the Proposed Project would use permanent H-frame hybrid structures and temporary wood poles or wood equivalent poles. The approximate dimensions of the proposed H-frame hybrid structure types are shown in Figure 2-17, Proposed H-frame hybrid Design, and summarized in Table 2-1, H-frame hybrid Transmission Structure Dimensions.

Transmission facilities would be designed consistent with the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (Avian Power Line Interaction Committee, 2006) where feasible. Transmission facilities would also be evaluated for potential collision reduction devices in accordance with *Reducing Avian Collisions with Power Lines: The State of Art in 2012* (Avian Power Line Interaction Committee, 2012).

OHGW would be installed on each 220-kV transmission structure at or near the top of each structure. The OHGW would typically be 0.5-inch diameter extra-high-strength galvanized steel.

Figure 2-16: Existing and Future Transmission Line System

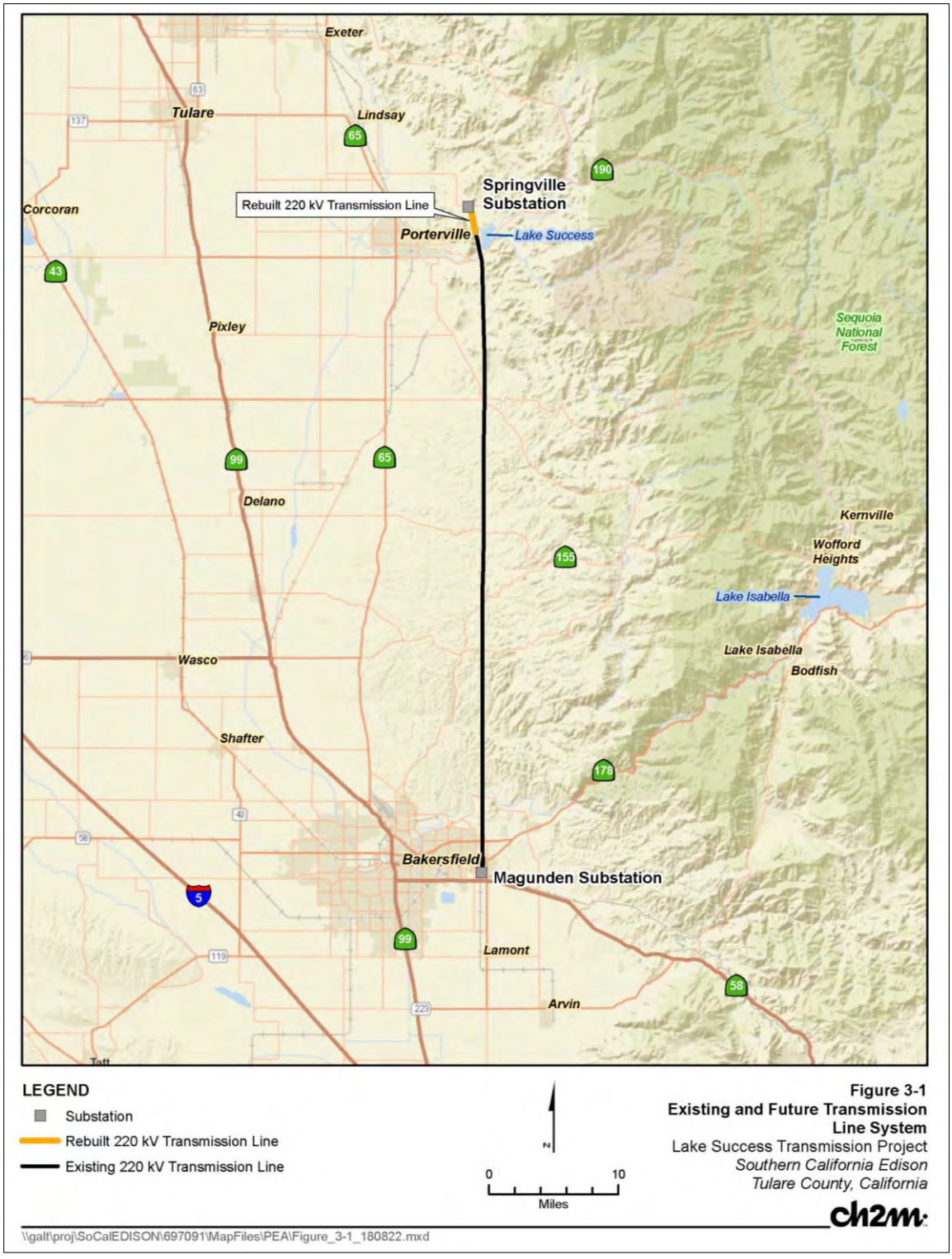
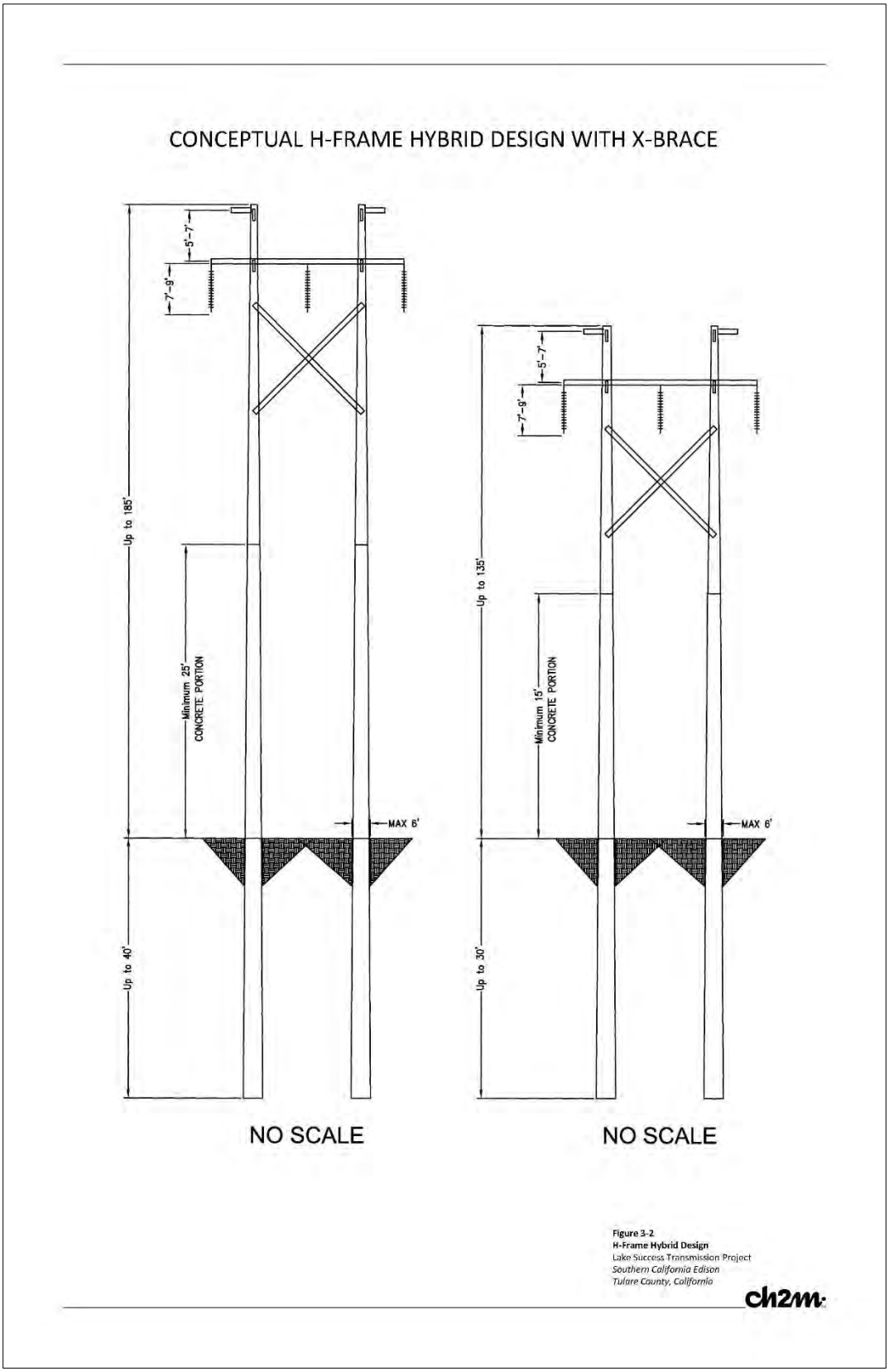


Figure 2-17: Proposed H-frame Hybrid Design



H-Frame Hybrid Structures

Approximately 14 H-frame hybrid structures would be used for the Proposed Project. The H-frame hybrid structures consist of two separate poles connected by cross arms and would be direct buried. Each H-frame hybrid structure pole consists of a pre-fabricated concrete base and light-weight steel (LWS) pole top section. The H-frame hybrid structures would extend approximately 120 to 190 feet aboveground, as shown in Table 2-1, H-frame hybrid Transmission Structure Dimensions. When surface water is present at Lake Success, the concrete base would project above the highest water level a minimum of 5 feet.

Table 2-1: H-Frame Hybrid Transmission Structure Dimensions

Type of Structure	Proposed Number of Structures	Approx. Height Above Ground (feet)	Approx. Pole Diameter (feet)	Approx. Auger Hole Depth (feet)	Approx. Auger Diameter (feet)
H-Frame Hybrid	8	130	4 to 6	30	5 to 7
H-Frame Hybrid	4	190	4 to 6	40	5 to 7
H-Frame Hybrid	2	120	4 to 6	30	4 to 7

Temporary Transmission Structures

Additionally, various types of temporary structures would be used throughout the Proposed Project to facilitate construction of the new 220-kV transmission lines. These temporary wood or wood equivalent poles would function as guard structures and/or shoofly structures and are further described in the sections titled, *Shoofly Construction* and *Guard Structures*. These temporary structures would be removed following completion of construction within a particular location. See Table 2-2 for approximate dimensions.

Table 2-2: Temporary Transmission Structure Dimensions

Type of Structure	Proposed Number of Structures	Approx. Height Above Ground (feet)	Approx. Pole Diameter (feet)	Approx. Auger Hole Depth (feet)	Approx. Auger Diameter (feet)
Temporary Wood or Wood-Equivalent Poles	36	145	3 to 5	25	4 to 6

Conductor/Cable

Above-ground Installation

Each transmission circuit typically includes three separate electrical phases. Each phase would consist of a new ACSS/TW for the Magunden-Springville No. 1 220-kV Transmission Line and ACSR wire for the Magunden-Springville No. 2 220-kV Transmission Line.[2] Both conductor types are made of aluminum strands with internal steel reinforcement and would have a non-specular finish. The conductor would have ground/water clearance of a minimum 61 feet and the horizontal distance between the conductors would be a minimum of 23 feet. The typical span length ranges between 1,000 and 2,050 feet.

Below-ground Installation

The proposed Project does not include below-ground transmission, subtransmission, or telecommunication facilities; however, belowground distribution facilities are described below.

Distribution Circuitry & Infrastructure

Distribution Infrastructure Description

The Proposed Project would include distribution removal, replacement, and/or relocation of approximately 40 poles on three miles of the existing 12-kV facilities all around the Lake Success area, including the area along the SR-190 bridge. The distribution project components are divided into five major areas around Lake Success and would involve the relocation and removal of the existing distribution facilities. In some areas new distribution line extensions would be required to re-route the existing lines, as well as provide electrical service to structures that are proposed to be moved further away from the lake perimeter. As the distribution scope represents the current known extent of work, as more information becomes available from LTRID and USACE, the scope could be modified.

Based on geographical information provided by the LTRID and USACE, four major areas around Lake Success have been evaluated:

- Western Perimeter

[2] For consistency with the existing wire along the Transmission Lines, the new conductor types would match the existing.

- Northern Zone
- Eastern Perimeter
- California SR-190 Bridge Area

In all areas, distribution facilities would be designed consistent with the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (Avian Power Line Interaction Committee, 2006).

Western Perimeter

Based on the information compiled and preliminary infrastructure surveys done, SCE determined that an existing USACE pump house would need to be relocated. The pump house is located approximately 3500 feet north along Avenue 146, from of the top of the spillway located just west of the western corner of the Lake Success dam. The pump house is located on the eastern side of Avenue 146. The new location of the pump house is proposed to be approximately 700 feet to the north east of the existing location on the west side of Avenue 146. Approximately three spans of distribution circuitry feeding the pump would be removed. From the new end point of the distribution line segment, the circuitry would be extended due north for approximately 600 feet, to serve the new location of the pump house proposed by the USACE.

Also, approximately 2.5 miles due north along Avenue 146, the USACE has proposed removing a private residence located on the east side of the road. As a result, SCE proposes to remove one pole and associated overhead conductor located near the northwest corner of the property. In addition to the pole removal, SCE proposes to relocate a second pole located approximately 250 feet north of the property, from the east side of the road to the west side of the road. This would be accomplished by removing the pole on the east side of the road and installing a new pole on the west side of the road. The overhead circuitry would then be routed as needed based on the new pole location.

Northern Zone

SCE determined that a segment of distribution circuitry along the northern waterline of the lake would be in the water line if the lake level is raised as proposed. The segment begins at the west shoulder of Road 292 and approximately 100 feet south of Avenue 175. The line extends for about 700 feet due west, and travels over the newly proposed lake's water levels. To ensure the distribution poles/structures are not in the water line, SCE proposes to re-route the line segment by relocating the segment approximately 100 feet north of the existing circuitry such that the segment would travel around the proposed lake water line. To accomplish this re-routing, SCE

proposes to remove two existing poles and install two to three new poles approximately 100 feet to the north of the existing line segment. Overhead conductor would then be routed from the start of the segment along the newly installed poles and finally connected to the existing circuity, located downstream of the segment to be removed.

Like the segment described above, a second distribution line segment crosses over parts of the northern waterline of the lake. This segment starts from the east shoulder of Road 296, approximately 120 feet north of the junction of Avenue 175 & Road 296. The line segment extends westwards for about 1,400 feet to provide service to a private residence located on the north side of Avenue 175. This segment travels directly over the proposed lake's new water level and as such, SCE proposes to relocate this line segment to ensure that the distribution circuitry is located away from the proposed lake waterline further towards the north of the existing segment. To accomplish this, three existing poles and approximately 1,400 feet of overhead circuitry and equipment would be removed. To continue to provide service to the private residence, a new segment would be constructed. The newly proposed segment would be tapped further north from existing distribution circuitry running along the eastern side of Road 296. The new segment would extend northwest for approximately 400 feet, then extend west for approximately 600 feet, and finally extend southwest for another 400 feet to connect to the distribution structure that feeds the private residence.

Eastern Perimeter

Towards the northeast side of the newly proposed waterline, SCE's distribution circuitry feeds several private residences along Holdridge Drive. SCE's distribution circuitry travels in a southwesterly direction along Holdridge Drive and follows the street when is turns due west. The circuit then branches north and south of Holdridge Drive along private roads to feed a few residences in the vicinity. Towards the south of Holdridge drive, two of the three residences are proposed to be removed, as one is within the newly proposed lake level waterline and the other further to the south is within 25 feet of the proposed waterline. Due to the distribution circuitry extending over the proposed water line and some structures that would be located within the boundary of the newly proposed lake levels, SCE proposes to remove the segments extending north and south of Holgate Drive. Removal and/or relocation of distribution circuitry, would also include a couple of spans before the segments branch to the north and the south of Holgate Drive. There structures are located along Holdridge drive, and approximately 1800 feet to the east of Road 292.

Removal would include approximately a dozen poles and 3,000 feet of overhead circuitry including circuit components and equipment such as crossarms, insulators, fuses switches etc.

On the south side of Holgate Drive where the road bends from a southwesterly direction to extend due west, SCE proposes to re-route the circuitry to feed two private residences, one towards the north west, currently fed by a pad mounted transformer and the other towards the south of Holgate Drive. Re-routing the circuitry to feed the private residences, would involve installing approximately three new poles and extending the circuitry overhead, due south to feed the residence to the south. Towards the northwest, circuitry would be extended in a northwesterly direction to a new distribution pole where the circuit would then transition underground to meet the existing underground electrical cables that feed the pad mounted transformer.

California Highway 190 Bridge Area

California Highway 190 runs along the western perimeter of Lake Success. Approximately one mile north of the Lake Success Dam, Highway 190 crosses over a portion of the lake. Existing distribution circuitry runs along the east side of this section of Highway 190. The circuitry continues to follow the east side of the highway and spans the bridge that crosses over Lake Success. In order to support the circuitry, existing distribution wood poles are set into the bridge abutments along the east side of the bridge. These poles are located at a considerably lower level on the bridge abutments as compared with the surface of the bridge. As a result, due to the proposed rise in lake's water level, several distribution poles would be in the water level. To ensure that these poles do not remain in water, when the lake's water level rises, SCE proposes to move and/or remove these structures from their existing positions.

Approximately 5 poles are currently set in or near the bridge abutments. For the poles set in the bridge abutments along the east side of the bridge, SCE proposes to move the location of these poles closer to the east guard rail of the bridge. The poles would be removed from their current location and set at a location closer to the bridge on the east side of the bridge abutments. SCE proposed to move these poles approximately 25 feet closer to the guard rail. Overhead circuitry that is supported by the structures would be moved in conjunction with the movement and re-alignment of these poles along the eastern guard rail of the bridge.

At the north end of the bridge the distribution circuitry branches into multiple directions. The main circuitry travels north along SR-190, while branches of the circuit extend to the east and west sides of the highway. The eastern circuit extension currently feeds a customer on the orchard towards the northeast of the bridge. The western circuit extensions feed a few structures located on the recreational area to the northwest of the bridge. To ensure that these structures are out of the waterline, SCE proposes to relocate two poles on the north end of the bridge located on either side of SR-190. SCE also proposes to remove approximately 6 poles located to the

northwest and northeast sides of the bridge. SCE proposes to remove the segment of the circuit extending along the southern border of the orchard to the northeast, which involves the removal of three poles and approximately 600 feet of overhead distribution circuitry and equipment. In addition to these pole removals, two circuit segments extending towards the west, including two poles would also be removed.

In addition to the circuitry proposed for relocation and/or removal described above, a field assessment would be made prior to and during construction. Should field conditions change or if additional information is provided by LTRID or USACE, SCE could remove and/or relocate other structures and circuitry in the vicinity of Lake Success as needed.

Right-of-way Requirements

Upon final engineering and receipt of Project approvals, SCE would confirm and acquire the necessary land rights for the Proposed Project. The proposed land rights that may need to be acquired and/or amended are as follows:

Access: At this time, no new or amended land rights are anticipated for the existing access and spur roads.

Transmission: The existing Magunden-Springville No. 1 and No. 2 220-kV Transmission Lines are located within a 200-foot ROW. The proposed tower replacement for these 220-kV transmission lines would be constructed within the same 200-foot ROW and would require upgrading existing rights. The land rights SCE would amend may include a combination of grants, leases, licenses, and easements over public and private land.

Distribution: The land rights SCE would secure for distribution relocations may include a combination of grants, leases, licenses, and easements of public and private land.

Construction Support: Based on final engineering and construction requirements, Temporary Entry Permits and/or leases may be acquired from private land owners to provide sufficient equipment and material storage, staging, down guys, construction access roads, and laydown/work areas for any approved Project component.

Construction

Staging Areas

Construction of the Proposed Project would require the establishment of temporary staging yards. Staging yards would be used as a reporting location for workers, vehicle and equipment parking, and material storage. The yard may also have construction trailers for supervisory and clerical personnel. Staging yards may be lit for staging and security. Normal maintenance and refueling of construction equipment would also be conducted at these yards. All refueling and storage of fuels would be in accordance with the Storm Water Pollution Prevention Plan (SWPPP).

Preparation of the staging yard would include temporary perimeter fencing and, depending on existing ground conditions at the site, grubbing and/or grading may be required to provide a plane and dense surface for the application of gravel or crushed rock. Any land that may be disturbed at the staging yard would be returned to preconstruction conditions or left in its modified condition, if requested by the landowner following the completion of construction for the Proposed Project. Potential staging yards are identified in Table 2-3.

Table 2-3: Approximate Laydown / Work Area Dimensions

Yard Name	Location	Condition	Approximate Area (Acres)	Project Component
Springville	Springville Substation	Disturbed	1-2 acres	Transmission and Distribution
Picnic Area	Approximately 0.5-mile southeast of Springville Substation	Disturbed	1-2 acres	Transmission and Distribution
West of Springville	Approximately 75 feet west of Springville Substation	Disturbed	2-3 acres	Transmission and Distribution
East of Springville	Approximately 0.2-mile east of Springville Substation	Disturbed	5 acres	Transmission and Distribution

Temporary power would be determined based on the type of equipment/facilities being used at the staging yards. If existing distribution facilities are available, a temporary service and meter may be used for electrical power at one or more of the yards. If it is determined that temporary power is not needed or available at the staging yards full time, a portable generator may be used intermittently for electrical power at one or more of the yards.

Materials commonly stored at the transmission construction staging yards would include, but are not limited to, construction trailers, construction equipment, portable sanitation facilities, steel bundles, temporary and permanent steel/wood poles, conductor reels, OHGW or Overhead Optical Ground Wire (OPGW) reels, hardware, insulators, cross arms, signage, consumables (such as fuel and filler compound), waste materials for salvaging, recycling, or disposal, and best management practice (BMP) materials (straw wattles, gravel, and silt fences).

Fuel and hydraulic fluids would be located at the construction staging yards. The routine transport, use, and disposal of hazardous materials, such as fuels, during construction may result in inadvertent releases of these materials. A SWPPP would be prepared and implemented throughout construction and would include BMPs to address the handling of hazardous materials during construction activities. Fuel from the construction staging yards may be transported to other portions of the Project area (e.g., structure locations, access/spur roads, ROW, etc.) via mobile refuelers. When not in use (e.g., parked), mobile refuelers would be subject to general containment provisions (e.g., parking area with berms) to contain potential leaks or spills.

Most materials associated with the construction efforts would be delivered by truck to designated staging areas, while some materials may be delivered directly to the temporary transmission construction areas.

Laydown/Work Areas

Transmission and distribution construction laydown/work areas serve as temporary working areas for crews and Project-related equipment and/or materials are placed at or near each structure location, within SCE ROW or franchise. Table 2-4, Approximate Laydown/Work Area Dimensions, identifies the approximate land disturbance for these construction area dimensions for the Proposed Project.

The new transmission structure pad locations and laydown/work areas (Table 2-4, Approximate Laydown/Work Area Dimensions) would first be graded and/or cleared of vegetation as required to provide a reasonably level and vegetation-free surface for structure installation. Sites would be graded such that surface water would run toward the direction of the natural drainage. In addition, drainage would be designed to prevent ponding and erosive water flows that could cause damage to the structure footings. The graded area would be compacted to at least 90 percent relative density and would be capable of supporting heavy vehicular traffic.

Erection of the structures may also require establishment of a temporary crane pad. The crane pad would occupy an area of approximately 70 feet by 70 feet and be located adjacent to each applicable structure within the laydown/work area used for structure assembly. The pad may be

cleared of vegetation and/or graded as necessary to provide a level surface for crane operation. The decision to use a separate crane pad would be determined during final engineering for the Proposed Project and the selection of the appropriate construction methods to be used by SCE or its Contractor.

For distribution, laydown/work areas typically span 50-feet by 100-feet and are located adjacent to the subject structures. Laydown/work areas are typically coned and isolated from vehicular and pedestrian traffic. In most cases, grading is not required. However, in some cases where overland travel may be needed to reach a structure, the area may be lightly graded to accommodate construction vehicles, equipment, and other construction related activities. In the event TSPs are needed for distribution structure replacement, laydown/work areas would be prepared in the same fashion as transmission laydown/work areas.

For TSP installations (alternative design) at the Highway 190 bridge, laydown/work areas would be prepared in the same fashion as Transmission laydown/work areas. As with Transmission construction, activities laydown/work areas would be graded and/or cleared of vegetation as required. Grading, compaction, and other construction activities would be similar to Transmission construction activities.

Table 2-4: Approximate Laydown / Work Area Dimensions

Laydown/Work Area Feature	Preferred Size (L x W) (feet)
Guard Structures	150-foot X 50-foot
H-Frame Hybrid Structures	220-foot X 220-foot
Temporary Wood or Wood Equivalent Poles	220-foot X 220-foot
Pull and Tension Areas	450-foot X 150-foot
Splicing Area	200-foot X 150-foot

Access Roads and/or Spur Roads

For construction of the Proposed Project, SCE would use a combination of access roads and spur roads from a network of existing paved and unpaved public and private roads. Transmission line roads are classified into two groups: access roads and spur roads. Access roads are through roads that run between tower sites along a ROW and serve as the main transportation route along line

ROWs. Spur roads are roads that lead from access roads and terminate at one or more structure sites. Of the 10 miles of existing access/spur roads included in the Proposed Project, approximately 6.3 miles of those existing access/spur roads would require rehabilitation.

Typical construction activities associated with rehabilitation of existing dirt access/spur roads include vegetation clearing, blade-grading, and recompacting to remove potholes, ruts, and other surface irregularities in order to provide a smooth, dense riding surface capable of supporting heavy construction and maintenance equipment. Existing dirt access/spur roads may also require additional upgrades such as protection for underground utilities and widening existing roads that are too narrow for safe vehicle operation. Repair and stabilization of slides, washouts, and other slope failures may be necessary to prevent future failures. The type of structure to be used would be based on specific site conditions to be determined during final engineering.

Generally, dirt access/spur roads would have a minimum 14-foot drivable width with 2 feet of shoulder on each side as determined by the existing land terrain to accommodate required drainage features. Typically, the drivable road width would be widened, generally ranging from an additional 0 to 8 feet along curved sections of the access road, creating up to 22 feet of drivable surface for the access/spur road. Access road gradients would be leveled so that sustained grades generally do not exceed 12 percent. Curves would typically have a minimum radius of curvature of 50 feet measured from the center line of the drivable road width. Specific site locations may require a wider drivable area to accommodate multi-point turns where 50 feet minimum radii cannot be achieved. SCE will work with the corresponding property owner(s) to identify the best route across the unimproved proposed and/or dedicated public streets to gain access to each pole site.

Generally, SCE would use overland travel from the edge of existing paved or dirt road to reach each structure site. If necessary, ground disturbance activities associated with these access/spur locations would be similar to the dimensions and activities described for the rehabilitation of existing unpaved roads, such as mowing, grubbing, and grade blading. The number of access locations required would be dependent upon final engineering, existing topographical considerations, and availability of suitable terrain that would provide safe access.

For distribution, typically overland travel from the edge of an existing paved or dirt road will be used to access the structure with some structures being accessed downline (parallel to the distribution line where safe to travel). Access/spur roads would typically not be created for distribution structure construction.

The Proposed Project's total access road land disturbance is described in Table 2-5, Access Road Land Disturbance.

Table 2-5: Access Road Land Disturbance

Project Feature	Site Quantity	Disturbance Acreage Calculation (Length x Width)	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
Transmission Existing Access/Spur Road for Rehabilitation	1	33,343-foot x 14-foot	10.7	0.0	0.0
Transmission Drive and Crush Access Road (Overland)	1	411-foot x 18-foot	0.2	0.2	0.0
Distribution Drive and Crush Acess road (Overland)	1	2 linear miles x 10-foot	2.4	2.4	0.0
Total	-	-	13.3	2.6	0.0

Helicopter Access

Helicopters may be used to support construction activities. Project-related helicopter activities may include, but are not limited to, temporary construction, wire-stringing activities, transportation of construction workers, delivery of equipment and materials to structure sites, structure placement, hardware installation, and marker ball installation (if applicable). SCE would consider IEEE Standards 951-1966, *Guide to the Assembly and Erection of Metal Transmission Structures*, and 524-2003, *Guide to the Installation of Overhead Transmission Line Conductors,* in the construction of the Proposed Project.

Helicopter operations and support areas would typically include helicopter staging and material yards, storage and maintenance sites, and ground locations in close proximity to conductor pulling, tensioning, and splice sites and/or within previously disturbed areas near construction sites. In addition, helicopters must be able to land within SCE ROWs, which could include landing on access or spur roads and within one or more of the staging yards identified in Table 2-3. At night or during off days, for safety and security concerns, helicopters and their associated

support vehicles and equipment may be based at a local airport(s); local airports include Eckert Field and Woodlake Airport.

The type of helicopter used for transmission line construction would be determined during final engineering and would depend on the helicopters and contract helicopter services available at the time of construction. For purposes of this analysis, the helicopter models include a light-duty Hughes 500E or similar for wire stringing activities. Depending on the activity, it is assumed that the total time within any given hour of the day that the helicopters would be used at any one structure location is approximately 5 to 15 minutes. The helicopters may travel back and forth between sites and staging yards multiple times within that hour. Depending upon the specific needs, Project-related helicopter activities for the construction of the transmission lines could occur across the entire Project area. Prior to the start of construction, SCE and the selected construction contractor would create a detailed Project-Specific Helicopter Use Plan describing all planned usage of helicopters or other aircraft in the performance of this work. This plan will be reviewed by SCE to ensure Federal Aviation Administration (FAA) regulations/guidance and/or industry BMPs are met. It would also include flight routes and altitudes in order to minimize flight into sensitive areas and to avoid aircraft congestion.

Cleanup and Post-Construction Restoration

SCE would clean up all areas that would be temporarily disturbed by construction of the Proposed Project (which may include the material staging yard, construction setup areas, stringing sites, and splicing sites) to as close to preconstruction conditions as feasible, or left in its modified condition, as agreed to by the landowner, following the completion of construction.

If restoration and/or revegetation occurs within sensitive habitats, a habitat restoration and/or revegetation plan(s) would be developed by SCE with the appropriate resource agencies and implemented after construction is complete. Additional information pertaining to the habitat restoration and/or revegetation plan(s) can be found in Section 3.4, Biological Resources.

Transmission Line Construction (Above-ground)

The following subsections describe the aboveground construction activities associated with installing the transmission line segments for the Proposed Project.

Pull and Tension Sites[3]

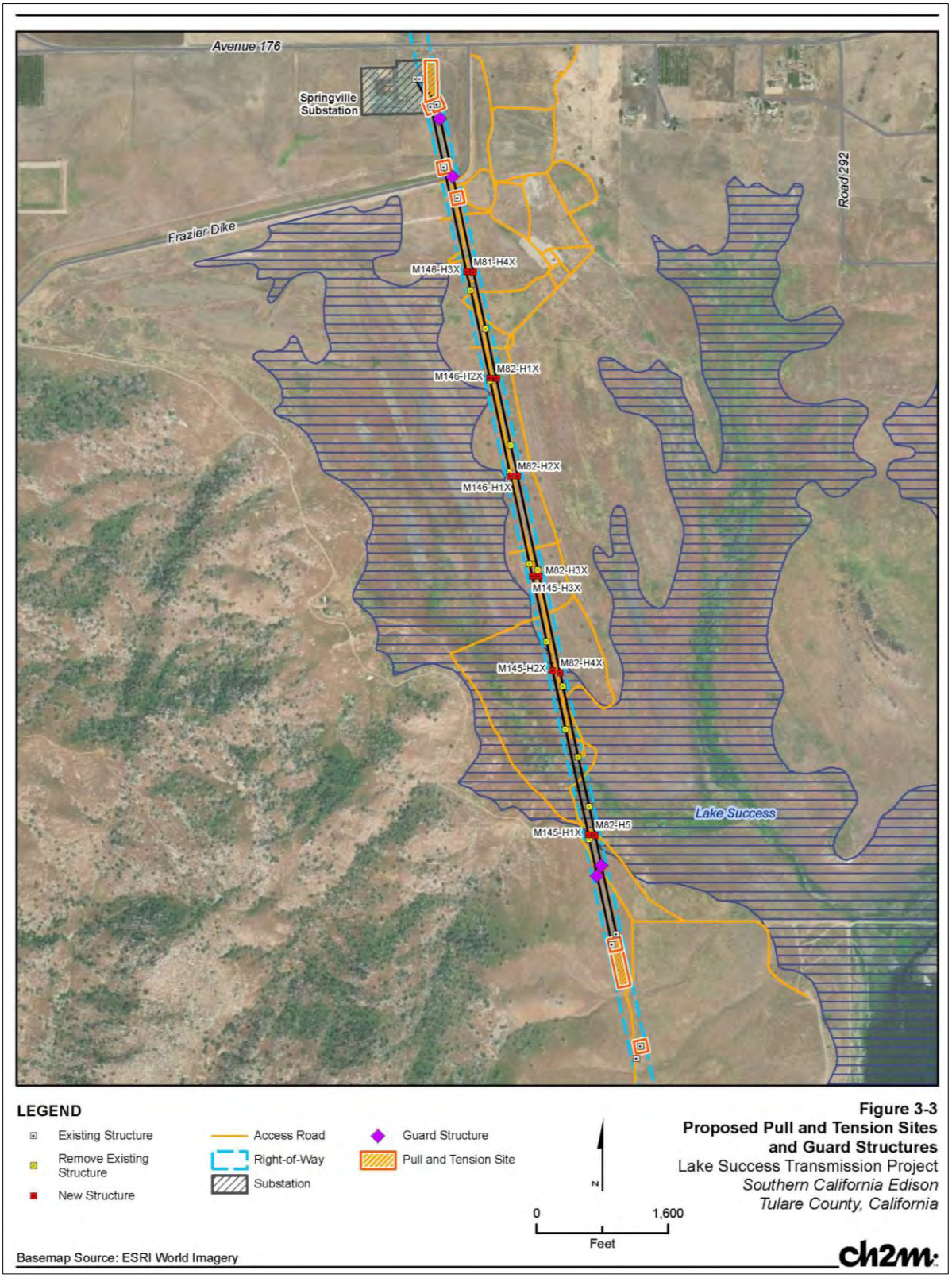
The puller, tensioner, and splicing setup locations associated with the Proposed Project would be temporary, and the land would be restored to its previous condition following completion of pulling and splicing activities or left in its modified condition, as agreed to by the landowner. The setup locations require level areas to allow for maneuvering of the equipment and, when possible, these locations would be located on existing roads and level areas to minimize the need for grading and cleanup. Approximately four setup locations are currently proposed; see Figure 2-18, Proposed Pull and Tension Sites and Guard Structures. The final number and location of these sites would be determined upon final engineering. The approximate area needed for stringing setups associated with wire installation is variable and depends upon terrain. See Table 2-3 for approximate size of pulling, tensioning, and splicing equipment setup areas and laydown dimensions.

Wire pulls are the length of any given continuous wire installation process between two selected points along the line. Wire pulls are selected based on a variety of factors, including availability of dead-end structures, conductor size, geometry of the line as affected by points of inflection, terrain, and suitability of stringing and splicing equipment setup locations. On relatively straight alignments, typical wire pulls occur approximately every 10,000 to 12,000 feet and wire splices every 7,500 to 9,000 feet on flat terrain. When the line route alignment contains multiple deflections, or is situated in rugged terrain, the length of the wire pull is typically diminished. Generally, pulling locations and equipment setups would be in direct line with the direction of the overhead conductors and established at a distance equal to approximately three times the height of the adjacent structure.

Each stringing operation consists of a puller setup positioned at one end, and a tensioner setup with wire reel stand truck positioned at the other end of the wire pull. Pulling and wire tensioning locations may also be used for splicing and field snubbing (temporary tensioning or anchoring) of the conductors. Temporary splices, if required, may be necessary since permanent splices that join the conductor together cannot travel through the rollers. Splicing setup locations are used to remove temporary pulling splices and install permanent splices once the conductor is strung through the rollers located on each structure. Field snubs (i.e., anchoring and dead-end hardware) would be temporarily installed to sag conductor wire to the correct tension at locations where stringing equipment cannot be positioned in back of a dead-end structure.

[3] For the purposes of this SEIR, the term "pull and tension site" is synonymous with the term "stringing sites."

Figure 2-18: Proposed Pull and Tension Sites and Guard Structures



Structure Installation and Removal

Existing Transmission Facility Removal

The Proposed Project would involve removing structures, conductor, and associated hardware.

The following work is proposed in the sequence below:

- Road work – Existing access/spur roads would be used to reach structures, but some rehabilitation and grading may be necessary before removal activities would begin to establish temporary crane pads for structure removal, etc.
- Wire-pulling locations – Wire-pulling sites would be located as described in Section *Pull and Tension Sites,* along the existing utility corridor, and would include locations at dead-end structures and turning points.
- Conductor removal – After the wire-pulling equipment is in place, rollers would be installed on structures, and the old conductor would be unclipped from the supporting structures, placed in rollers, and pulled out with a pulling rope and/or cable attached to the trailing end of the conductor. The old conductor would be transported to a construction yard where it would be prepared for recycling.
- Structure removal – For each structure to be removed, a laydown/work area equivalent to the structure type being removed would be required. Most structure-removal activities would use the crane pad or other previously disturbed area established for structure installation. If previously disturbed areas adjacent to the structure site are not available, an area would be cleared of vegetation and graded if the ground is not level. The crane would be positioned adjacent to the LST location to dismantle the structure. LSTs would be dismantled down to the foundations, and the materials would be transported to a construction yard where they would be prepared for recycling.
- Footing/foundation removal – Foundations/footings would typically be crushed by mechanical means such as a pneumatic hammer. Footings would be removed to a point 1 to 2 feet below grade, and the holes would be filled with excess soil and smoothed to match the surrounding grade. Footing materials would be transported to a construction yard where they would be prepared for disposal.

Any existing transmission lines and telecommunication lines (where applicable) would be transferred to the new structures prior to removal of existing structures. Any remaining facilities that are not reused by SCE would be removed and delivered to a facility for disposal.

The temporary shoofly wood or wood equivalent poles would be completely removed once the transmission lines are transferred to the new structures. The removal would consist of the above-

and belowground portions of the pole. The holes left from removing the poles would be backfilled with spoils that may be available as a result of the excavation for new poles and using imported fill as needed.

Pole/Tower Installation

H-Frame Hybrid Pole Installation

Each H-frame hybrid pole would consist of a prefabricated concrete base that would require a hole to be excavated by using either an auger or a backhoe. The poles consist of separate base and top sections and may be placed in temporary laydown areas at each pole location. Depending on conditions at the time of construction, the top LWS pole sections may be preconfigured, be configured on the ground, or be configured after pole installation with the necessary cross arms, insulators, and wire-stringing hardware. Depending on soil conditions, a steel caisson may be set in the hole prior to the concrete base. The prefabricated concrete base is then set inside of the caisson and backfilled. When the base section is secured, the LWS pole sections would be installed by slipping them onto the concrete base. Typically, a crane and a line truck are used for the installation of hybrid poles. The poles are set one section at a time, and once the pole is completely assembled, the sections are jacked together. The final engineering design would determine the appropriate backfill material to fill the annular space around the foundation, but typically, a granular backfill or slurry backfill material is used.

Shoofly Construction

Construction of the Proposed Project may require the use of temporary shoofly facilities in order to maintain continuous power flow during construction. A shoofly is a temporary transmission line that is used during construction to maintain electrical service to the area while allowing portions of the permanent line to be taken out of service, ensuring safe working conditions during construction activities. The shoofly would consist of approximately 36 wood or wood equivalent poles and conductor.

The poles would be direct buried and extend approximately 145 feet aboveground. The diameter of the poles would be approximately 3 to 5 feet at ground level and would taper to the top of the pole; See Table 2-2, Temporary Transmission Structure Dimensions.

Temporary guying supports may be required in order to ensure stability of shoofly structures during construction activities. Structure guying consists of a steel wire known as a “down guy,” which is attached to the structure and is connected to a 1-inch-diameter anchor at ground level.

Conductor/Cable Installation

Above-ground

Wire stringing activities would be in accordance with SCE common practices and similar to process methods detailed in the Institute of Electrical and Electronics Engineers (IEEE) Standard 524-2003, *Guide to the Installation of Overhead Transmission Line Conductors*. To ensure the safety of workers and the public, safety devices such as traveling grounds, guard structures, radio-equipped public safety roving vehicles, and linemen would be in place prior to the initiation of wire-stringing activities. Advanced planning is required to determine circuit outages, pulling times, and safety protocols to ensure that the safe installation of wire is accomplished.

Wire-stringing includes all activities associated with the installation of the primary conductors onto transmission line structures. These activities include the installation of conductor, ground wire (OHGW/OPGW), insulators, stringing sheaves (rollers or travelers), vibration dampeners, weights, suspension, and dead-end hardware assemblies for the entire length of the route.

The following five steps describe typical wire-stringing activities:

- Step 1 – Planning: Develop a wire-stringing plan to determine the sequence of wire pulls and the setup locations for the wire pull/tensioning/splicing equipment.
- Step 2 – Sock Line Threading: A helicopter would fly a lightweight sock line from structure to structure, which would be threaded through rollers in order to engage a camlock device that would secure the pulling sock in the roller. This threading process would continue between all structures through the rollers of a particular set of spans selected for a wire pull.
- Step 3 – Pulling: The sock line would be used to pull in the conductor-pulling rope and/or cable. The pulling rope or cable would be attached to the conductor using a special swivel joint to prevent damage to the wire and to allow the wire to rotate freely to prevent complications from twisting as the conductor unwinds off the reel.
- Step 4 – Splicing: Sagging and Dead-Ending: Once the conductor is pulled in, if necessary, all mid-span splicing would be performed. Once the splicing has been completed, the conductor would be sagged to proper tension and dead-ended to structures.
- Step 5 – Clipping-In: After the conductor is dead-ended, the conductors would be secured to all tangent structures; a process called clipping in. Once this is complete, spacers would be attached between the bundled conductors of each phase to keep uniform separation between each conductor.

Refer to Figure 2-18, Proposed Pull and Tension Sites and Guard Structures, for structure and laydown/work area locations.

Guard Structures

Guard structures are temporary facilities that would typically be installed at transportation, flood control, and utility crossings for wire-stringing/removal activities. These structures are designed to stop the movement of a conductor should it momentarily drop below a conventional stringing height. SCE estimates that four guard structures may need to be constructed along the proposed route.

Depending on the overall spacing of the conductors being installed, approximately two to four guard poles would be required on either side of a crossing. In some cases, the temporary wood poles could be substituted with the use of specifically equipped boom trucks or, at highway crossings, temporary netting could be installed if required. The guard structures would be removed after the conductor is secured into place.

For utility undercrossings and private-access dirt roads, SCE would work closely with the applicable jurisdiction to secure the necessary permits to string conductor over the applicable infrastructure.

Energizing Transmission

Energizing the new lines is the final step in completing the transmission construction. The existing lines would be de-energized in order to connect the new line segments to the existing system. To reduce the need for electric service interruption, de-energizing and re-energizing the existing lines may occur at night when electrical demand is low.

Distribution

Distribution Line Construction (Aboveground)

Construction activities for distribution facilities would primarily include the installation of new facilities such as wood poles, overhead electrical conductors, and underground facilities. The underground facilities would include distribution conduit and underground electrical cables, as well as in-ground concrete structures, if needed. Construction would also include the removal of existing facilities such as wood poles, overhear electrical conductors, pole-mounted distribution

equipment and cross-arms, and sections of underground facilities. The underground facilities would include conduit, electrical cable, and in-ground concrete structures, if needed.

Distribution Infrastructure Removal (Aboveground)

The Proposed Project would involve removing structures, conductor, and associated distribution hardware/equipment. In some cases, to maintain continuity of service to customers, temporary facilities such as a shoofly would need to be constructed, prior to facility removal.

For removal, the following work is proposed in the sequence below:

- Road work – Existing access roads would be used to reach structures, but some overland travel may be necessary before removal activities would begin. Temporary laydown/work areas in proximity to the structure would be established to prepare for structure removal, etc. As stated in Section 3.7.1.3, for distribution, typically overland travel from the edge of an existing paved or dirt road will be used to access the structure with some structures being accessed downline (parallel to the distribution line where safe to travel). Access/spur roads would typically not be created for distribution structure construction.

Wire-pulling locations – Wire-pulling sites would be located as described in the accompanying GIS, along the existing utility lines, and would include locations at dead-end structures and turning points.

Conductor removal – After the wire-pulling equipment is in place, rollers would be installed on structures, and the old conductor would be unclipped from the supporting structures, placed in rollers, and pulled out with a pulling rope and/or cable attached to the trailing end of the conductor. The old conductor would be transported to a construction yard where it would be prepared for recycling.

Pole mounted equipment removal – Any existing distribution and telecommunication equipment (where applicable) would be removed and/or transferred to the new structures prior to removal of existing structures. Pole mounted components such as cross-arms, insulators and equipment would be unmounted and removed from the pole/structure. The materials that are not reused would be transported to a construction yard where they would be prepared for recycling or disposal.

Structure removal – The removal would consist of the above- and belowground portions of the pole. For each structure to be removed, a laydown/work area adjacent to the structure being removed would be required. Most structure-removal activities would use previously disturbed areas such as existing roads and areas frequented by vehicular traffic. In some cases, overland

travel would be required to reach the structure slated for removal. If previously disturbed areas adjacent to the structure site are not available, an area would be cleared of vegetation and may require grading if the ground is not level. Once the structure is removed, the materials would be transported to a construction yard where they would be prepared for recycling or disposal.

Once the wood or wood-equivalent structures are completely removed, the holes left from removing the poles/structures would be backfilled with spoils that may be available as a result of the excavation for new poles and/or using imported fill as needed.

Removal of Overhead Conductor and Pole Mounted Infrastructure

Removal of overhead wire involves the pulling and tensioning of the distribution overhead wires. The puller, tensioner, and splicing setup locations associated with the Proposed Project would be temporary, and the land would be restored to its previous condition following completion of pulling and splicing activities. The setup locations require level areas to allow for maneuvering of the equipment and, when possible, these locations would be located on existing roads and level areas to minimize the need for overland travel, grading, and cleanup. Several setup locations currently proposed would fall withing the laydown/work areas described in the accompanying GIS package. The final number and location of these sites would be determined upon final engineering. The approximate area needed for stringing setups associated with wire installation is variable and depends upon terrain. See Table 3-7: Proposed Project Estimated Land Disturbance for approximate size of laydown/work areas and construction disturbance acreage dimensions.

Wire pulls are the length of any given continuous wire installation process between two selected points along the line. Wire pulls are selected based on a variety of factors, including availability of dead-end structures, conductor size, geometry of the line as affected by points of inflection, terrain, and suitability of stringing and splicing equipment setup locations. On flat terrain and relatively straight alignments, typical wire pulls occur approximately every 1,000 to 3,000 feet and wire splices every 3,000 to 5,000 feet. When the line route alignment contains multiple deflections, or is situated in rugged terrain, the length of the wire pull is typically diminished. Generally, pulling locations and equipment setups would be in a direct line with the direction of the overhead conductors and established at a distance equal to approximately three times the height of the adjacent structure.

Each stringing or removal operation consists of a puller setup positioned at one end, and a tensioner setup with wire reel stand truck positioned at the other end of the wire pull. Pulling and wire tensioning locations may also be used for existing splicing and field snubbing of the

conductors. Temporary splices, if required, may be necessary since permanent splices that join the conductor together cannot travel through the rollers. Field snubs (i.e., anchoring and dead-end hardware) would be temporarily installed to sag conductor wire to the correct tension at locations where stringing equipment cannot be positioned in the back of a dead-end structure.

Removal of Existing Structures

Prior to removal of existing structures, the existing structure-mounted distribution infrastructure and co-located telecommunication lines if applicable, would be removed and/or transferred to the newly erected structures, where applicable. All remaining distribution infrastructure that would not be reused by SCE would be removed and delivered to a facility for recycling. It is assumed that the third-party telecommunications infrastructure that share poles or structures with SCE's distribution facilities would also be removed and delivered to the third-party's appropriate facilities for recycling / disposal.

The existing wood poles and/or LWS poles would be completely removed once the distribution, and telecommunication lines are transferred to new poles and/or removed from the existing poles. Poles would be jarred/shaken in place such that the portion of the pole below ground would be loosened from the ground. The pole would then be extracted from the ground from where the pole was originally set. In some cases, hand digging around the existing pole may be required to adequately loosen the soil around it. The removal would consist of the above and below ground portions of the pole. Holes left from removing the poles would be backfilled with spoils that may be available as a result of the excavation for new poles and using imported fill, as needed.

Distribution Infrastructure Installation

The Proposed Project would involve installing structures, conductor, and associated distribution hardware/equipment. In some cases, to maintain continuity of service to customers, temporary facilities such as a shoofly would need to be constructed, prior to facility removal.

For new/relocated infrastructure installation, the following work is proposed in the sequence below:

- Road work – Existing access roads would be used to reach the proposed new structure locations, but some overland travel may be necessary before installation activities would begin. Temporary laydown/work areas in proximity to the proposed new structure locations would be established to prepare for structure installation, etc.

- Structure installation – The installation of a pole/structure would start with excavating a hole in the proposed location. Prior to the pole being placed in the hole, crossarms, insulators and other framing accoutrements would be mounted and/or bolted to the pole. Once the framing is completed, the pole would then be placed in the hole. The pole would be set such that it sits firmly in the ground and is in line with the proposed distribution overhead conductor. The hole that the pole now sits in will be backfilled with excavated soil. The soil would then be tamped to a satisfactory compaction level.
- Wire-pulling locations – Wire-pulling sites would be located adjacent to the newly proposed infrastructure locations, along the newly proposed or relocated linear segments of distribution infrastructure. These would include locations at proposed existing/new dead-end structures and turning points.
- Conductor installation – After the wire-pulling equipment is in place, rollers would be installed on structures, and the new conductor would be pulled, unclipped from the supporting structures, placed in rollers, and pulled out with a pulling rope and/or cable attached to the trailing end of the conductor using trucks and other ground-based equipment. No helicopters will be used to remove/install distribution conductor. The old conductor would be transported to a construction yard where it would be prepared for recycling.
- Pole-mounted equipment installation: Any existing distribution and telecommunication equipment (where applicable) would be installed and/or transferred to the new structures prior to removal of existing structures. Equipment would then be appropriately connected to the overhead distribution lines such that the equipment is correctly tied into the distribution circuitry.
- Once the wood or wood equivalent structures are completely removed, the holes left from removing the poles/structures would be backfilled with spoils that may be available as a result of the excavation for new poles and/or using imported fill as needed.

Lightweight Steel Pole Installation

SCE does not anticipate any LWS poles to be used for the distribution infrastructure of the proposed Project as it is expected that wood or wood-equivalent structures will be used. However, if needed, each LWS pole would require a hole to be excavated using either an auger or a backhoe. Excavated material would be reused, recycled or appropriately disposed. LWS poles consist of separate base and top sections and may be placed in temporary laydown areas at each pole location. Depending on the conditions at the time of construction, the top sections may come pre-configured, be configured on the ground, or be configured after pole installation with the necessary cross arms, insulators, and wire-stringing hardware. The LWS poles would then be installed in the holes, typically by a line truck with an attached boom. When the base section is

secured, the top section would be installed on top of it. Depending on the terrain and available equipment, the pole sections could also be assembled into a complete structure on the ground prior to setting the poles in place within the holes. LWS guy stub poles would be installed similarly to LWS poles.

Tubular Steel Pole Installation

The Proposed Project does not anticipate any TSP installation for distribution facilities. However, should TSPs be needed, specifically for the proposed alternative at the Highway 190 bridge, the following describes construction activities related to TSP installation.

Each TSP would require a drilled, poured-in-place, concrete footing that would form the structure foundation. The hole would be drilled using truck- or track-mounted excavators to accommodate for the TSP foundation. As with the installation of LWS or wood poles, excavated material would be reused, recycled or appropriately disposed. Following excavation of the foundation, footings and steel-reinforced cages would be set, survey positioning would be verified, and concrete would then be poured. Foundations in soft or loose soil, or that extend below the groundwater level, may be stabilized with drilling mud slurry if needed. Should the mud slurry be needed, it would be placed in the hole after drilling to prevent the sidewalls from sloughing. Concrete would then be pumped to the bottom of the hole, displacing the mud slurry. Depending on site conditions, the mud slurry brought to the surface would typically be collected in a pit adjacent to the foundation or vacuumed into a truck, and then pumped out to be reused or discarded at an appropriate off-site disposal facility.

TSPs consist of separate base and top sections. The pole sections would be placed in temporary laydown areas at each pole location. Depending on conditions at the time of construction, the top sections may come pre-configured, be configured on the ground, or be configured after pole installation with the necessary cross arms, insulators, and wire-stringing hardware. A crane would then be used to set each steel pole base section on top of the previously prepared foundations. If existing terrain around the TSP location is not suitable to support crane activities, a temporary crane pad would be constructed within the laydown area. When the base section is secured, the top section of the TSP would be set in place on the base section, and the two sections would be slipped or bolted together. The two sections may also be spot welded together for additional stability. Depending on the terrain and available equipment, the pole sections could also be pre-assembled into a complete structure prior to setting the poles.

Conductor/Cable Installation

Wire stringing activities would be in accordance with SCE common practices and similar to process methods detailed in the Institute of Electrical and Electronics Engineers (IEEE) Standard 524-2003, *Guide to the Installation of Overhead Transmission Line Conductors*. To ensure the safety of workers and the public, safety devices such as traveling grounds, guard structures, radio-equipped public safety roving vehicles, and linemen would be in place prior to the initiation of wire stringing activities. Advanced planning is required to determine circuit outages, pulling times, and safety protocols to ensure that the safe installation of wire is accomplished.

Wire stringing includes all activities associated with the installation of the primary conductors onto distribution line structures. These activities include the installation of conductor, ground wire, insulators, stringing sheaves (rollers or travelers), vibration dampeners, weights, suspension, and dead-end hardware assemblies for the entire length of the route.

The following five steps describe typical wire stringing activities:

- Step 1 – Planning: Develop a wire stringing plan to determine the sequence of wire pulls and the setup locations for the wire pull/tensioning/splicing equipment.
- Step 2 – Sock Line Threading: A helicopter would fly a lightweight sock line from structure to structure, which would be threaded through rollers in order to engage a camlock device that would secure the pulling sock in the roller. This threading process would continue between all structures through the rollers of a particular set of spans selected for a wire pull.
- Step 3 – Pulling: The sock line would be used to pull in the conductor-pulling rope and/or cable. The pulling rope or cable would be attached to the conductor using a special swivel joint to prevent damage to the wire and to allow the wire to rotate freely to prevent complications from twisting as the conductor unwinds off the reel.
- Step 4 – Splicing, Sagging, and Dead-Ending: Once the conductor is pulled in, if necessary, all mid-span splicing would be performed. Once the splicing has been completed, the conductor would be sagged to proper tension and dead-ended to structures.
- Step 5 – Clipping In: After the conductor is dead-ended, the conductors would be secured to all tangent structures, a process called "clipping in". Once this is complete, spacers would be attached between the bundled conductors of each phase to keep uniform separation between each conductor.

Distribution Line Construction (Underground)

Construction activities for the installation of distribution underground facilities would follow a typical sequence of steps as listed below.

- Surveying
- Digging and Trenching
- Underground civil infrastructure construction
- Underground electrical infrastructure construction
- Electrical termination and construction completion

Surveying

Construction activities would begin with the survey of existing underground utilities along the proposed underground construction route or withing the construction area. SCE would notify all applicable utilities via Underground Service Alert (USA, or DigAlert) to locate and mark existing utilities and conduct exploratory excavations (potholing) as necessary to verify the location of existing utilities. SCE would secure all necessary permits such as encroachment permits for trenching in public streets as required.

Digging and Trenching

For installation of linear underground distribution circuitry, an approximately 24-inch-wide by 36-inch-deep trench would be required to place the distribution circuitry in an underground configuration. This depth is required to meet the minimum 24 inches of cover above the duct bank and may vary to avoid other existing utilities. Trenching may be performed by using the following general steps, including, but not limited to:

- mark the location and applicable underground utilities,
- lay out trench line,
- saw cut asphalt or concrete pavement as necessary,
- dig to appropriate depth with a backhoe or similar equipment, and
- install duct bank.

For installation of distribution underground structures, based on the structure size an appropriately sized area – larger than the proposed structure – would be excavated. Once all the earth works have been completed the sites would then be ready for civil infrastructure construction

Once the duct bank has been installed, the trench would be backfilled with a slurry mix or native soil as necessary. Excavated materials would be disposed of at an off-site disposal facility in accordance with all applicable laws. Should groundwater be encountered, it would be pumped into a tank and disposed of at an off-site disposal facility in accordance with all applicable laws.

The trench for underground construction would be widened and shored where appropriate to meet California Occupation and Safety Health Administration (CalOSHA) requirements. Trenching would be staged so that open trench lengths would not exceed that which is required to install the duct banks. Where needed, open trench sections would have steel plates placed over them in order to maintain vehicular and pedestrian traffic. Provisions for emergency vehicle access would be arranged with local jurisdictions in advance of construction activities.

Underground Civil Infrastructure Construction

As trenching and excavation for the underground distribution facilities are completed, SCE would begin to install the underground duct bank. Two to six polyvinyl chloride (PVC) conduits would be laid in the open trench to accommodate electrical circuitry to be installed in them. Collectively, the duct bank is comprised of cable conduit, spacers, ground wire, and concrete encasement as needed. In some cases, PVC conduits would be direct buried in the trench where applicable per construction standards. The duct bank typically consists of two to six 5-inch diameter polyvinyl chloride (PVC)PVC conduits. Each conduit would accommodate and hold a single three-phase distribution circuit. Typical distribution duct bank installations would consist of two to six ducts and accommodate one to four circuits. In instances where a distribution duct bank would cross or run parallel to other substructures that operate at normal soil temperature (e.g., gas lines, telephone lines, water mains, storm drains, and sewer lines), a minimal radial clearance of 6six inches for crossing and 12 inches for paralleling these substructures would be required. Where duct banks cross or run parallel to substructures that operate at temperatures significantly exceeding normal soil temperature (e.g., other underground transmission circuits, primary distribution cables, steam lines, and heated oil lines), additional radial clearance may be required. Clearances and depths would meet requirements set forth within CPUC G.O. 128.

For underground structure installation the structure would then be lowered into the excavated area and adjusted for level & orientation. Once the structure is in place other connecting

infrastructure – such as PVC conduits to hold circuitry, would then be constructed to "meet" the underground structure. The civil infrastructure would then be checked and prepared for electrical construction.

Underground Electrical Infrastructure Construction

Following underground structures and duct bank installation, SCE would utilize the newly installed and existing structures and duct banks, to pull the electrical cables through the duct banks, splice the cable segments at each structure, and terminate cables at the overhead transition structures where the line would transition from underground to overhead. To pull the cables through the duct banks, a cable reel would be placed at one end of the conduit segment, and a pulling rig would be placed at the opposite end. The cable from the cable reel would be attached to a rope in the duct bank. The rope linked to the pulling rig, would pull the rope and the attached cable through the duct banks. A lubricant would be applied as the cable enters the ducts to decrease friction and facilitate travel through the PVC conduits.

Electrical Termination and Construction Completion

At the end of an underground segment, where the cables would rise out of the ground and transition from an underground to overhead configuration, poles with conduit attached alongside the pole would facilitate the transition from underground to overhead. Transition structures constructed as part of the Proposed Project would typically consist of wood poles. The transition structure would support cable terminations, lightning arresters, and dead-end hardware for overhead conductors.

Finally, after all the construction activities are completed, SCE construction crews would perform their checks and inspections prior to energizing the newly constructed infrastructure. Energizing the new lines is the final step in completing the distribution construction. To reduce the need for electric service interruption, de-energizing and re-energizing the existing distribution lines may occur at night when electrical demand is low, but could also occur anytime during the day.

Distribution Infrastructure Removal (Underground)

Similar to installation of distribution facilities, removal activities of distribution underground facilities would follow a typical sequence of steps as listed below.

- Surveying

- Electrical de-energization and disconnection
- Underground electrical infrastructure removal
- Digging and Trenching
- Underground civil infrastructure removal
- Site remediation and restoration

Surveying

Construction activities would begin with the survey of existing underground SCE facilities and other utilities along the proposed underground construction route or withing the construction area. SCE would notify all applicable utilities via Underground Service Alert to locate and mark existing utilities and conduct exploratory excavations (potholing) as necessary to verify the location of existing utilities. SCE would secure all necessary permits such as encroachment permits for trenching in public streets as required.

Electrical De-energization and Disconnection

Prior to removal of any electrical facilities, SCE construction crews would ensure the circuitry is de-energized and slated for removal per the construction plans and design. Any pre-work that can be done safely prior to de-energization, would be done to minimize the continuity or service to downstream customers. Once appropriately de-energized, the circuitry would be disconnected and prepared for removal.

Underground Electrical Infrastructure Removal

Following the de-energization of the underground circuitry slated for removal, SCE would pull the electrical cables out of the existing the duct banks and structures. To pull the cables through the duct banks, a cable reel would be placed at one end of the conduit segment along with a pulling rig. A rope from the cable reel would be attached to the conductor in the duct bank. The rope linked to the pulling rig, would pull the attached cable out of the existing duct banks. A lubricant may be applied as the cable exits the ducts to decrease friction and facilitate travel through the PVC conduits.

Digging and Trenching

For removal of linear underground distribution infrastructure, an approximately 24-inch-wide by 36-inch-deep trench would be excavated to remove the distribution conduits. This depth is

required to remove the existing infrastructure and may vary to avoid other existing utilities. Trenching may be performed by using the following general steps, including, but not limited to:

- mark the location and applicable underground utilities,
- lay out trench line,
- saw cut asphalt or concrete pavement as necessary,
- dig to appropriate depth with a backhoe or similar equipment, and
- remove duct bank.

For removal of distribution underground structures, based on the structure size an appropriately sized area – larger than the proposed structure – would be excavated.

Underground Civil Infrastructure Removal

Once all the earth works have been completed the ducts and sub-surface structures would then be extracted from the excavated area. The structures and duct banks would then be appropriately disposed of at an off-site disposal facility in accordance with all applicable laws.

Site Remediation and Restoration

Once the duct bank and underground structures have been removed, the trench and excavated areas would be backfilled with native soil as necessary. Should groundwater be encountered, it would be pumped into a tank and disposed of at an off-site disposal facility in accordance with all applicable laws.

The trench for underground construction would be widened and shored where appropriate to meet CalOSHA requirements. Trenching would be staged so that open trench lengths would not exceed that which is required to remove the duct banks. Where needed, open trench sections would have steel plates placed over them in order to maintain vehicular and pedestrian traffic. Provisions for emergency vehicle access would be arranged with local jurisdictions in advance of construction activities.

Finally, surface treatment of the site would be performed. For example, roadways would be repaved and concrete areas would be restored.

Land Disturbance Summary

Land disturbance would include all areas affected by construction of the Proposed Project. It is estimated that the total permanent land disturbance for the Proposed Project would be approximately 1.4 acres. It is estimated that the Proposed Project would temporarily disturb approximately 113.0 acres, with 100.7 acres to be restored. The estimated amount of land disturbance for each Project component is summarized in Table 2-6, Proposed Project Estimated Land Disturbance.

Table 2-6: Proposed SCE Project Estimated Land Disturbance

Project Feature	Quantity	Disturbance Acreage Calculation (Length x Width) (feet)	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
Material and Equipment Staging Yard	4	Range of 1-5 acres (Maximum 12 acres)	12	12	0.0
Transmission					
Guard Structures	4	150 X 50	0.7	0.7	0.0
Remove Existing Lattice Steel Tower (a)	15	220 X 220	16.6	16.6	0.0
Construct New H-Frame Hybrid (b)	14	220 X 220	15.5	14.1	1.4
Construct Shoofly (b)	36	220 X 150	27.3	27.3	0.0
Conductor Stringing Setup Area (c)	4	450 X 150	4.1	4.1	0.0
Conductor Stringing Setup Area for Shoofly (c)	4	600 X 150	8.3	8.3	0.0
Conductor Splicing Setup Area (c)	2	200 X 150	1.4	1.4	0.0

Conductor Splicing Setup Area for Shoofly (c)	2	200 X 150	1.4	1.4	0.0
Existing Access/Spur Road Rehabilitation	1	33,343 X 14	10.7	0.0	0.0
Drive and Crush Access/Spur Road	1	411 X 18	0.2	0.2	0.0
Existing Tower Laydown/work Area	7	150 X 150	3.6	3.6	0.0
General Disturbance Area	1	Within existing SCE right-of-way	19.1	19.1	0.0
Subtotal Transmission			**104.7**	**92.6**	**1.4**
Distribution					
Complete Remove pole (e)	15	50-foot x 100-foot	1.7	1.7	0.0
Remove and Replace pole (Frame & Set New Poles) (f)	22	50-foot x 100-foot	2.5	2.5	0.0
Conductor Stringing Setup Area (f)	12	50-foot x 100-foot	1.4	1.4	0.0
Underground Cable Removal	1	100-foot x 150-foot	0.3	0.3	0.0
Overland Access Temporary Access Roads	2.0	Linear miles x 10-foot wide	2.4	2.4	0.0
Subtotal Distribution			**8.3**	**8.3**	**0.0**
Total Estimated Disturbance (d)			**113.0**	**100.0**	**1.4**

Notes:

(a): Includes removal of existing conductor, teardown of existing structure, and removal of foundation 2 inches below ground surface.

(b): Includes structure assembly and erection, and conductor and OHGW installation. Area to be restored after construction. Portion of ROW within 20 feet of all structures to remain cleared of vegetation. Permanently disturbed area for H-Frames = 0.1 acre.

H-frame structure Base Volume and Area Calculations: H-frame 2 per structure, 25 feet deep, 6 feet diameter; earth removed for structure base = 52 cubic yards; surface area = 57 square feet; shoofly 1 per structure, 20 feet deep, 5 feet diameter; earth removed for structure base = 14.5 cubic yards; surface area = 13 square feet.

(c): Based on standard conductor reel lengths, conductor size, number of circuits, route design and terrain.

(d): Includes the removal of existing structure & conductor.

(e): Includes framing & setting, conductor installation or transfer. Area to be restored after construction. Portion of R/W within 20' of ALL structures to remain cleared of vegetation. Permanently disturbed areas for Poles=0.05 acre.

Distribution structure Base Volume and Area Calculations: Average Pole depth 12-foot deep, 2.5-foot diameter, qty 1 per Pole. Earth removed for pole base = 2.2 cubic yards.; surface area = 4.9 square feet.

(f): Based on approximate length of overland in miles multiplied by drivable width of 10-foot road.

(g): The disturbed acreage calculations are estimates based upon SCE's preferred area of use for the described Project feature, the width of the existing ROW, or the width of the proposed ROW, and they do not include any new access/spur road information; they are subject to revision based upon final engineering and review of the Project by SCE's Construction Manager and/or Contractor-awarded Project. The disturbance acreages identified do not account for overlapping disturbance areas within the Project features.

Construction Workforce and Equipment

Construction would be performed by either SCE construction crews or contractors. If SCE construction crews are used, they typically would be based at SCE's local facilities, (e.g., service centers, substation, transmission ROW, etc.) or a temporary material staging yard set up for the Proposed Project. Contractor construction personnel would be managed by SCE construction management personnel and based out of the contractor's existing yard or temporary material staging yard set up for the Proposed Project. SCE anticipates a total of approximately 45 construction personnel working on any given day. SCE anticipates that crews would work concurrently whenever possible; however, the estimated deployment and number of crew members would vary depending on factors such as material availability, resource availability, and construction scheduling. Crews will stay overnight in Porterville, California, as needed by construction scheduling. Daily, crews will park personal vehicles at staging yards prior to deployment to laydown/work areas in construction vehicles.

In general, construction efforts would occur in accordance with accepted construction industry standards. If feasible, SCE would comply with local ordinances for construction activities.

Construction Schedule

SCE anticipates that construction, including cleanup, of the Proposed Project would take approximately 12-17 months[4], when the lake bed is dry. Construction would commence

[4] The proposed construction schedule does not account for unforeseen proposed Project delays, including, but not limited to, those due to inclement weather and/or stoppage necessary to protect biological resources (e.g., nesting birds).

following California Public Utilities Commission (CPUC) approval, final engineering, procurement activities, land rights acquisition, and receipt of all applicable permits.

Operation and Maintenance

Ongoing operation and maintenance activities are necessary to ensure reliable service, as well as the safety of the utility worker and the general public, as mandated by the CPUC. SCE facilities are subject to Federal Energy Regulatory Commission jurisdiction. SCE transmission facilities are under operational control of the CAISO.

The transmission and distribution lines would be maintained in a manner consistent with CPUC G.O. 95 and G.O. 128, as applicable, and the National Electrical Safety Code for those circuits that are located outside of California. Normal operation of the lines would be controlled remotely through SCE control systems, and manually in the field as required. SCE inspects the transmission and distribution overhead facilities in a manner consistent with CPUC G.O. 165 a minimum of once per year via ground and/or aerial observation, but usually occurs more frequently based on system reliability. Maintenance would occur as needed and could include activities such as repairing conductors, washing or replacing insulators, repairing or replacing other hardware components, replacing poles and towers, tree trimming, brush and weed control, and access/spur road maintenance. Most regular operations and maintenance activities of overhead facilities are performed from existing access/spur roads with no surface disturbance. Repairs done to existing facilities, such as repairing or replacing existing poles and towers, could occur in undisturbed areas. Existing conductors could require re-stringing to repair damages. Some pulling site locations could be in previously undisturbed areas and at times, conductors could be passed through existing vegetation on route to their destination.

Routine access/spur road maintenance is conducted annually and/or as-needed. Road maintenance includes maintaining a vegetation-free corridor (to facilitate access and for fire prevention) and blading to smooth over washouts, eroded areas, and washboard surfaces as needed. Access/spur road maintenance could include brushing (i.e., trimming or removal of shrubs) approximately 2 to 5 feet beyond berms or road's edge when necessary to keep vegetation from intruding into the roadway. Road maintenance would also include cleaning ditches, moving and establishing berms, clearing and making functional drain inlets to culverts, culvert repair, clearing and establishing water bars, and cleaning and repairing over-side drains. Access/spur road maintenance includes the repair, replacement, and installation of storm water diversion devices as-needed.

Insulators could require periodic washing with water to prevent the buildup of contaminants (dust, salts, droppings, smog, condensation, etc.) and reduce the possibility of electrical arcing, which can result in circuit outages and potential fire. Frequency of insulator washing is region-specific and based on local conditions and build-up of contaminants. Replacement of insulators, hardware, and other components is performed as needed to maintain circuit reliability.

Some structure locations and/or laydown areas could be in previously undisturbed areas and could result in ground and/or vegetation disturbance, though attempts would be made to use previously disturbed areas to the greatest extent possible. In some cases, new access is created to remove and replace an existing structure.

Regular tree pruning must be performed to comply with existing state and federal laws, rules, and regulations and is crucial for maintaining reliable service, especially during severe weather or disasters. Tree pruning standards for distances from overhead lines have been set by CPUC (G.O. 95, Rule 35), California Public Resource Code 4293, California Code of Regulations Title 14, Article 4, and other government and regulatory agencies. SCE's standard approach to tree pruning is to remove at least the minimum required by law plus one years' growth (species dependent).

In addition to maintaining vegetation-free access/spur roads, helipads, and clearances around electrical lines, clearance of brush and weeds around structures, and, as may be required by applicable regulations, on fee-owned ROWs, is necessary for fire protection. A 10-foot radial clearance around non-exempt poles (as defined by California Code of Regulations Title 14, Article 4) and a 25- to 50-foot radial clearance around non-exempt towers (as defined by California Code of Regulations Title 14, Article 4) are maintained in accordance with Public Resource Code 4292.

In addition to regular operations and maintenance activities, SCE conducts a wide variety of emergency repairs in response to emergency situations such as damage resulting from high winds, storms, fires, and other natural disasters, and accidents. Such repairs could include replacement of downed structures, lines, or re-stringing conductors. Emergency repairs could be needed at any time.

2.6 Comparison of 1999 FEIS/FEIR and Proposed Project Descriptions

The following table provides a side-by-side comparison of the Project components described in the 1999 EIS/EIR and the Project as proposed (and analyzed) in this SEIR.

Project Component	1999 FEIS/FEIR Project Description	2020 Proposed Project Description	Comparison Determination
Spillway Modification	Concrete ogee weir installed to raise existing spillway by 10 feet and widen from 200 to 365 feet	Concrete ogee weir installed to raise existing spillway by 10 feet and widen from 200 to 365 feet	**Same**
Gross Pool Elevation	Maximum gross pool elevation raised from 652.5 feet to 662.5 feet M.S.L. **(NGVD29) (Note: this is essentially the same as 655.1 feet to 665.1 feet NAVD88). NGVD 29 = NAVD88 -3.6 feet +/- 0.5 feet. The method of establishing elevation of the reservoir was different, but the actual elevation figures are the same.**	Maximum gross pool elevation raised from 655.1 feet NAVD88 (652.5 feet NGVD29) to 665.1 feet NAVD88 (662.5 feel NGVD29).	**Same**
Water Storage Capacity	Increase of 28,000 acre-feet from 82,300 to 110,300 acre-feet	Increase of 28,000 acre-feet from 82,300 to 110,300 acre-feet	**Same**
Reservoir Surface Area	Increase of 720 acres from 2,400 to 3,120 acres	Increase of 720 acres from 2,400 to 3,120 acres	**Same**
Recreation Areas Impacted	Add flood protection to restroom facilities at the Tule Recreation Area and Rocky Hill Recreation Area. Widen / extend boat ramp at the Tule Recreation Area and enlarge parking lot.	Relocate restroom at the Tule Recreation Area and add flood protection. Add flood protection to restroom facility at the Rocky Hill Recreation Area. Widen / extend boat ramp at the Tule Recreation Area and enlarge parking lot. Widen / extend boat ramp at	**Proposed Project provides additional improvements to recreational facilities.**

		the Rocky Hill Recreation Area and enlarge parking lot.	
Dwelling Units to be Removed	Four (4)	Three (3)	**Proposed Project requires the removal of one less dwelling unit to accommodate the Project.**
State Highway 190 Bridge Impacts	Add rock slope protection	Add rock slope protection	**Same**
Frazier Dike Improvements	Add 3,500 linear feet of rock slope protection	Add 2,500 linear feet of rock slope protection	**Proposed Project requires less linear feet (-1,000) of rock slope protection.**
SCE Transmission and Distribution	Raise/replace 14 transmission towers and 11,800 feet of power lines. Relocate or replace various distribution power lines and poles.	Raise/replace 15 transmission towers with 14 new hybrid H-frame structures and reconductor approximately 2 miles of transmission lines. Relocate or replace approximately 40 distribution poles.	**Proposed Project requires less transmission towers to be replaced, but will be slightly taller than the 1999 FEIS/FEIR Project.**

2.7 Project Objectives

In accordance with CEQA Guidelines Section 15124(b), the following are the Lower Tule River Irrigation District's Project objectives:

- Provide increased flood protection to urban and agricultural areas.
- Provide increased storage for Tule River irrigation water, incidental to the flood control objective.
- Enhance storage space for sediment in Lake Success.
- Provide increased recreational opportunities within the basin.

The following are Southern California Edison's Project objectives as they pertain to utility infrastructure associated with the Project:

- Provide safe and reliable electrical service.
- Address steel tower corrosion of Magunden-Springville No. 1 and No. 2 220-kV Transmission Lines.
- Address existing 12-kV distribution facilities that will be affected by the rise in lake levels.
- Address both General Order (G.O.) 95 and USACE Regulation 1110-2-4401 conductor clearance requirements for the Magunden-Springville No.1 and No.2 220-kV Transmission Lines.
- Comply with all applicable reliability-planning criteria required by North American Electric Reliability Corporation, Western Electricity Coordinating Council, and the California Independent System Operator.
- Meet Project needs while minimizing environmental impacts.
- Design and construct the Project in conformance with SCE's approved engineering, design, and construction standards for substation, transmission, subtransmission, and distribution system projects.

Chapter 3

IMPACT ANALYSIS

3.1 Aesthetics

This section of the SEIR examines visual resources in the proposed Project vicinity and potential impacts the Project may have on the aesthetic character of the landscape. No NOP comment letters were received pertaining to this topic.

Determination of Adequacy of 1999 FEIS/FEIR

The proposed Project footprint and area of potential effect (APE), as well as the proposed new maximum gross pool elevation raise has not changed since evaluation in the 1999 FEIS/FEIR. The 1999 FEIS/FEIR did not identify any significant impacts associated with aesthetics. However, additional information is being provided herein regarding impacts to aesthetics. Therefore, the following determinations are made:

Topic	Further Analysis Required?	1999 FEIS/FEIR Analysis Sufficient?
a. Have a substantial adverse effect on a scenic vista?		✓
b. Substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?		✓
c. In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point.) If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?		✓
d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?		✓

Discussion:

Existing Visual/Aesthetic Setting

The proposed Project is located in the western foothills of the Sierra Nevada mountain range approximately 6 miles east of the City of Porterville within unincorporated Tulare County, California. Elevations of the Project site range from 650 to 700 feet above sea level. The area surrounding the proposed Project and Lake Success is characterized by recreation and agricultural land uses, with scattered residences. The Project area is dominated visually by Lake Success and the surrounding grassy hills. Man-made features in the area include the existing roadways, utilities (SCE Transmission and Distribution Lines), the reservoir dam, camping/recreation areas, parking areas and associated improvements.

The vegetation and geological features around Lake Success provide aesthetic values that attract recreational users. The lake itself and the surrounding foothills, annual grassland, and riparian vegetation provide aesthetic values to local and non-residents that visit the area. The dam is a distinct visual feature. The river corridor leading to the dam is a meandering greenway mixed with riverine riparian habitat and shaded riverine aquatic environments. Not visible from the nearby populated area, the dam is usually viewed only upon approach, and from as far away as a few miles downstream. Currently, the lake water level fluctuates seasonally, with a corresponding change in the viewshed at the reservoir.

Lake Success is a multi-purpose reservoir built in 1961 to provide flood protection and irrigation water for urban and agricultural land along the Tule River. The existing and proposed Project alignments cross the western arm of the lake, which is subject to a lack of water during dry periods. The lake and surrounding Corps property are managed to provide the public with opportunities for outdoor activities, including boating, water skiing, sailing, swimming, kayaking, hunting, and fishing. A commercial marina is located on the eastern perimeter of the reservoir and offers boat rentals, boat slips, jet skis, bait, tackle, food, and fuel.

On the northeastern shore of the reservoir, the Tule Campground features a 103-site campground, picnic sites, a playground, and an amphitheater that are open year-round for public use. The Tule Campground area is available for day-use and overnight visitation.

Located along the western shore of Lake Success are Lake Success Park and the Rocky Hill Recreation Area. Lake Success Park is a small, grassy 1.6-acre park. Rocky Hill Recreation Area is a popular destination for picnicking and fishing. A network of unofficial trails exists in this same area and provides opportunities for hiking, birding, mountain biking, and horseback riding.

Hunting is permitted in the 1,400-acre Kincade Cove Wildlife Management Area in the northwestern area of the Corps property, southeast of Frazier Dike, in accordance with California hunting regulations. Kincade Cove is supported with well water, parking, and restroom facilities.

Annual recreation use in the area of Lake Success reaches approximately 500,000 visits per year, peaking in April through July. Visitation data indicates that the Lake Success area has consistently supported between 2.5 and 3 million visitor hours each year.

Lake Success is bounded to the west and south by a minor range of north-to-south-trending foothills, which rise to an elevation of approximately 1,650 feet above sea level. Rolling foothill topography lies to the east and north, with moderate levels of residential development to the east and lighter residential development to the north. The foothill town of Springville is approximately 6.5 miles northeast of the proposed Project while the community of East Porterville is approximately 2.5 miles to the east. There are no views of the Project site from Springville or East Porterville because of intervening topography.

Proposed Changes to the Existing Visual/Aesthetic Setting

The proposed Project includes modifying the existing spillway by constructing a concrete ogee weir which will increase the gross pool elevation by ten feet, which will in turn increase the existing water storage capacity and increase the reservoir surface area. In addition to reinforcing the Highway 190 bridge abutments and Frazier Dike, the increased pool elevation will require structures and supporting utilities at both the Rocky Hill and Tule Recreation Areas to be relocated or flood protected. Relocated or modified structures include restroom facilities, parking areas, boat ramps, pumphouse facilities, a storage tank, well, and metal shed. Other than increasing the maximum gross pool elevation, the Project primarily consists of relocation of or modification to existing facilities.

SCE Project Components

Due to Corps Engineering Regulation (ER) 1110-2-4401, the SCE transmission line which crosses over the western edge of Lake Success would have to be raised to a minimum height of 52 feet to accommodate sailboats. SCE would replace 15 lattice steel transmission towers with 14 new, higher H-frame hybrid transmission structures (See Figure 2-14 in Chapter Two – Project Description). Figure 2-14 shows SCE Transmission lines (black) with 15 transmission towers (purple) that would be replaced with 14 higher-clearance transmission towers (red). This work would occur after the ogee weir construction is complete, when lake levels are low to avoid in-

water work. In addition, up to 40 distribution power poles on three miles of the existing 12-kV facilities all around the Lake Success area, including the area along the Highway 190 bridge would be removed, replaced or relocated (Figure 2-15 in Chapter Two – Project Description). SCE's Proposed Project activities also includes use of nearby staging yards and adjacent access roads.

Visual/Aesthetic Impact Determination

The proposed Project would result in short-term and long-term impacts from construction activities to the visual character of the primarily natural environment. Short-term impacts would include introducing construction equipment, workers, and materials to the Project area.

Construction activities will be visible for a period of up to 17 months. Proposed Project construction would require establishing temporary staging yards for vehicle and equipment parking, as well as material storage. Staging yard preparation would include temporary perimeter fencing. These visual effects would be temporary because disturbed staging land would be restored to near pre-construction conditions as part of the Project following construction completion.

Staging yards may be lit for staging and security. All such lighting would be installed and operated in conformance with applicable local lighting ordinances and regulations. If nighttime lighting would be necessary, it would generally be directed and focused away from off-site locations to the extent feasible. If temporary construction lighting is required, shielded construction light fixture would be utilized and lighting would be directed away from nearby residences to the extent feasible. Because this impact is temporary in nature and the affected views would generally be brief in duration, these visual effects would be considered less than significant.

Long-term visual impacts would result from modifying the existing spillway by constructing a concrete ogee weir which will increase the gross pool elevation by ten feet, which will in turn increase the existing water storage capacity and increase the reservoir surface area. In addition to reinforcing the Highway 190 bridge abutments and Frazier Dike, the increased pool elevation will require structures and supporting utilities at both the Rocky Hill and Tule Recreation Areas to be relocated or flood protected. Relocated or modified structures include restroom facilities, parking areas, boat ramps, pumphouse facilities, a storage tank, well, and metal shed. A relatively minor increase in lighting may occur associated with the expanded parking areas. All such lighting would be installed and operated in conformance with applicable local lighting

ordinances and regulations. If nighttime lighting would be necessary, it would generally be directed and focused away from off-site locations to the extent feasible. Other than increasing the maximum gross pool elevation, the Project primarily consists of relocation of or modification to existing facilities. Because these facilities already exist in the Project area, modification and/or relocation will not introduce new significant visual changes to the area and the impact is considered less than significant.

The raising of the maximum gross pool elevation will be visible during wet years when increased water storage is available. This will increase the visible surface area of the lake around the perimeter, however the increased amount of surface area of the lake will be visually similar to existing conditions and will only be noticeable when maximum water storage is available. These sporadic visual changes associated with the increased surface elevation are not considered to have a significant impact on the aesthetics of the reservoir.

Adverse effects to the aesthetics of the area would be reduced to less than significant by replanting disturbed areas with native herbaceous, shrub and tree material after construction. After lake levels recede from the higher proposed gross pool, Corps staff will clear deposited sediment from parking areas and other facilities around the reservoir.

In addition, because the proposed Project is not located within the boundaries of an adopted state scenic highway, and furthermore does not contain protected scenic resources, including trees, rock outcroppings, and historic buildings, the proposed Project will not substantially damage protected scenic resources.

SCE Project Components

SCE construction activities will be visible for a period of approximately 12-17 months. Proposed Project construction would require establishing temporary staging yards for vehicle and equipment parking, as well as material storage. Staging yard preparation would include temporary perimeter fencing. These visual effects would be temporary because SCE would restore any land that may be disturbed at the staging yards to near pre-construction conditions, or to the conditions agreed upon between the landowner and SCE following the completion of proposed Project construction. Because construction impacts are temporary, the impact will be less than significant.

Once the SCE Project components are constructed, the proposed Project will not substantially degrade the existing visual character of the Project site and its surroundings, as SCE's activities consist of replacement of facilities rather than introduction of new facilities. Areas where there are moderate levels of impact tend to be within close proximity of the transmission corridor;

however, the highly trafficked recreational sites in the Lake Success area are not within close proximity of the line and would experience no impact to low impact. These changes to the visual character and quality of the site will be ***less than significant***.

Therefore, the following determinations are made:

CEQA Guidelines Section 15162(a)(1-3)	YES	NO
1. Substantial changes are proposed in the project which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;		✓
2. Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.		✓
3. New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified shows any of the following: a. The project will have one or more significant effects not discussed in the previous EIR; b. Significant effects previously examined will be substantially more severe than shown in the previous EIR; c. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or		✓

d. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.		

Mitigation Measures:

The mitigation measures listed below are assigned to either the Lead Agency or SCE. The Lead Agency will be responsible for implementation and compliance with the measures listed under "New Mitigation Measures proposed by Lead Agency" and SCE will be responsible for implementation and compliance with the measures listed under "New Mitigation Measures proposed by SCE (Utility Modifications)".

1999 FEIS/FEIR: No mitigation measures pertaining to this topic were identified.

New Mitigation Measures proposed by Lead Agency:

AES-1 Following construction activities, disturbed areas will be replanted with native herbaceous, shrub and tree material. After lake levels recede from the higher proposed gross pool, Corps staff will clear deposited sediment from parking areas and other facilities around the reservoir.

New Mitigation Measures proposed by SCE (Utility Modifications): No new or additional mitigation measures are necessary.

Cumulative Impacts:

The scope for considering cumulative impacts to aesthetics are the geographic areas immediately surrounding the proposed Project stie. As described above, construction impacts would be temporary and once construction is completed, the existing viewshed will only be minimally altered. As such, the Project would have a ***less than cumulatively considerable impact*** to visual and scenic resources.

3.2 Agricultural and Forestry Resources

This section of the SEIR identifies potential impacts of the proposed Project pertaining to Agricultural and Forestry Resources. No NOP comment letters were received pertaining to this topic.

Determination of Adequacy of 1999 FEIS/FEIR

The proposed Project footprint and study area, as well as the proposed new maximum gross pool elevation raise has not changed since evaluation in the 1999 FEIS/FEIR. The 1999 FEIS/FEIR did not identify any significant impacts associated with agriculture or agricultural resources. However, the CEQA Guidelines have been updated to include questions related to impacts to forestry resources. Therefore, the following determinations are made:

Topic	Further Analysis Required?	1999 FEIS/FEIR Analysis Sufficient?
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?		✓
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?		✓
c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	✓	
d. Result in the loss of forest land or conversion of forest land to non-forest use?	✓	
e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of	✓	

Farmland, to non-agricultural use or conversion of forest land to non-forest use?		

Discussion:

The 1999 FEIS/FEIR did not identify any significant impacts regarding agriculture or agricultural resources. The proposed transmission line and distribution modifications would occur within existing SCE easement and/or ROWs. The proposed spillway enlargement would result in the permanent conversion of approximately 1.5 acres of citrus orchards are within the proposed gross pool and would be acquired by LTRID. About 0.5 acres of the orchards are prime farmland (Soil Survey Staff). The Natural Resources Conservation Service uses a land evaluation and site assessment (LESA) system to establish a farmland conversion impact rating score on proposed sites of Federally funded and assisted projects. This score is used as an indicator for the project sponsor to consider alternative sites if the potential adverse impacts on the farmland exceed the recommended allowable level. For the Tule River Spillway Enlargement Project, the LESA score is too low and thus the Project does not fall under the authority of the Farmland Protection Policy Act. Since the Land Evaluation and Site Assessment score for the site was lower than 160, the Farmland Protection Policy Act does not apply, no mitigation is required, and the impacts to prime or unique farmlands are deemed to be less than significant.

Updated CEQA Guidelines Questions

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

No Impact. The Project are is within an area of Tulare County designated either as Agricultural / Farmland or Non-Agricultural / Natural Vegetation by the State Farmland Mapping and Monitoring Program[1]. There are no areas zoned or designated as forest land or timberland. As such, there are ***no potential impacts*** resulting from forest or timber land conflicts.

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

No Impact. As discussed above, there is no forest land within the Project area. There are ***no***

[1] California Department of Conservation. California Important Farmland Finder. https://www.conservation.ca.gov/dlrp/fmmp/Pages/Tulare.aspx. Accessed July 2020.

impacts to the loss of forest land or conversion of forest land to non-forest use.

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

Less Than Significant Impact. As discussed above, the 1999 FEIS/FEIR did not identify any significant impacts regarding agriculture or agricultural resources. The proposed Project would result in the permanent conversion of approximately 1.5 acres of citrus orchards are within the proposed gross pool and would be acquired by LTRID. About 0.5 acres of the orchards are prime farmland (Soil Survey Staff). The Natural Resources Conservation Service uses a land evaluation and site assessment (LESA) system to establish a farmland conversion impact rating score on proposed sites of Federally funded and assisted projects. This score is used as an indicator for the project sponsor to consider alternative sites if the potential adverse impacts on the farmland exceed the recommended allowable level. For the Tule River Spillway Enlargement Project, the LESA score is too low and thus the Project does not fall under the authority of the Farmland Protection Policy Act. Since the Land Evaluation and Site Assessment score for the site was lower than 160, the Farmland Protection Policy Act does not apply, no mitigation is required, and the impacts to prime or unique farmlands are deemed to be ***less than significant.***

Therefore, the following determinations are made:

CEQA Guidelines Section 15162(a)(1-3)	YES	NO
1. Substantial changes are proposed in the project which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;		✓
2. Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.		✓
3. New information of substantial importance, which was not known and could not have been known with the exercise of		✓

reasonable diligence at the time the previous EIR was certified shows any of the following: a. The project will have one or more significant effects not discussed in the previous EIR; b. Significant effects previously examined will be substantially more severe than shown in the previous EIR; c. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or d. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.		

Mitigation Measures:

1999 FEIS/FEIR: No mitigation measures pertaining to this topic were identified.

New Mitigation Measures proposed by Lead Agency: No new or additional mitigation measures are necessary.

New Mitigation Measures proposed by SCE (Utility Modifications): No new or additional mitigation measures are necessary.

Cumulative Impacts:

The scope for considering cumulative impacts to agricultural and forest resources are the geographic areas covered by the Tulare County General Plan / EIR and as well as all of Tulare County. Tulare County is the boundary for consideration of cumulative impacts on agricultural and forestry resources because land use decisions at the county level generally involve agricultural areas (as opposed to development within incorporated areas of the County) and most data regarding agriculture is aggregated at the county level. Cumulative development anticipated in the region may result in impacts to agricultural resources, including the permanent loss and or reduction of agricultural land. Subsequent projects implemented under the County's General Plan would be required to be consistent with the policies of the General Plan. As indicated herein, the Project will result in the loss of 1.5 acres of farmland and no loss of forest or timber land. This does not constitute a significant impact either at the Project-level or cumulative level. Therefore, the proposed Project's incremental contribution to cumulative agriculture or forest impacts would be ***less than cumulatively considerable***.

3.3 Air Quality

This section of the SEIR evaluates the potential impacts to Air Quality associated with implementation of the proposed Project. No NOP comments were received pertaining to Air Quality.

Determination of Adequacy of 1999 FEIS/FEIR

The proposed Project footprint and area of potential effect (APE), as well as the proposed new maximum gross pool elevation raise has not changed since evaluation in the 1999 FEIS/FEIR. However, the CEQA Guidelines have been updated to include additional questions and new thresholds related to impacts to air quality. Therefore, the following determinations are made:

Topic	Further Analysis Required?	1999 FEIS/FEIR Analysis Sufficient?
a. Would the project conflict with or obstruct implementation of the applicable air quality plan or result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	✓	
b. Expose sensitive receptors to substantial pollution concentrations?	✓	
c. Result in other emissions (such as those leading to odors affecting a substantial number of people?	✓	

Discussion:

Impacts to air quality were evaluated in the 1999 FEIS/FEIR; however, the CEQA Guidelines have been amended to require additional analysis. As such, this SEIR evaluates potential Project-related impacts to air quality.

Environmental Setting

San Joaquin Valley Air Basin

The following discussions on topography, climate, wind patterns, temperature, precipitation, humidity and fog in the San Joaquin Valley Air Basin (SJVAB) are taken from the San Joaquin Valley Air Pollution Control District's (SJVAPCD) Guidance for Assessing and Mitigating Air Quality (GAMAQI).[1]

"[The SJVAB] consists of eight counties: Fresno, Kern (western and central), Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare... Cumulatively, these counties represent approximately 16 percent of California's geographic area, making the SJVAB the second largest air quality basin (based on area) as delineated by the California Air Resources Board (CARB). Air pollution in the SJVAB can be attributed to both human-related (anthropogenic) and natural (non-anthropogenic) activities that produce emissions. Air pollution from significant anthropogenic activities in the SJVAB includes a variety of industrial-based sources as well as on- and off-road mobile sources. Activities that tend to increase mobile activity include increases in population, increases in general traffic activity (including automobiles, trucks, aircraft, and rail), urban sprawl (which will increase commuter driving distances), and general local land management practices as they pertain to modes of commuter transportation. These sources, coupled with geographical and meteorological conditions unique to the area, stimulate the formation of unhealthy air.

The San Joaquin Valley's (SJV) topography and meteorology provide ideal conditions for trapping air pollution for long periods of time and producing harmful levels of air pollutants, including ozone and particulate matter. Low precipitation levels, cloudless days, high temperatures, and light winds during the summer in the SJV are conducive to high ozone levels resulting from the photochemical reaction of nitrogen oxides (NOx) and volatile organic compounds (VOC). Inversion layers in the atmosphere during the winter can trap emissions of directly emitted PM2.5 (particulate matter that is 2.5 microns or less in diameter) and PM2.5 precursors (such as NOx and sulfur dioxide (SO2)) within the SJV for several days, accumulating to unhealthy levels. The region also houses the State's major arteries for goods and people movement, I-5 to the west and CA Highway 99 through the Central Valley (Valley), thereby attracting a large volume of vehicular traffic. Another compounding factor is the region's historically high rate of population growth compared to other regions of California. Increased

[1] San Joaquin Valley Air Pollution Control District. *Guidance for Assessing and Mitigating Air Quality Impacts.* http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf. Accessed July 2020.

population typically results in an even greater increase in vehicle activity and more consumer product use, leading to increased emissions of air pollution, including NOx. In fact, mobile sources account for about 80% of the Valley's total NOx emissions inventory. Since NOx is a significant precursor for both ozone and PM2.5, reducing NOx from mobile sources is critical for progressing the Valley towards attainment of ozone and PM2.5 standards.

The geography of mountainous areas to the east, west and south, in combination with long summers and relatively short winters, contributes to local climate episodes that prevent the dispersion of pollutants. Transport, as affected by wind flows and inversions, also plays a role in the creation of air pollution."[2]

Topography

"The climate of the SJV is modified by topography. This creates climatic conditions that are particularly conducive to air pollution formation… [The] SJV is surrounded by mountains on three sides and open to the Sacramento Valley and the San Francisco Bay Area to the north.

The SJVAB is the southern half of California's Central Valley and is approximately 250 miles long and averages 35 miles wide. The SJV is bordered by the Sierra Nevada Mountains in the east (8,000 to 14,491 feet in elevation), the Coast Ranges in the west (averaging 3,000 feet in elevation), and the Tehachapi mountains in the south (6,000 to 7,981 feet in elevation). There is a slight downward elevation gradient from Bakersfield in the southeast end (elevation 408 feet) to sea level at the northwest end where the valley opens to the San Francisco Bay at the Carquinez Straits. At its northern end is the Sacramento Valley, which comprises the northern half of California's Central Valley. The bowl-shaped topography inhibits movement of pollutants out of the valley."[3]

Climate

"The SJV is in a Mediterranean Climate Zone. Mediterranean Climates Zones occur on the west coast of continents at 30 to 40 degrees latitude and are influenced by a subtropical high-pressure cell most of the year. Mediterranean Climates are characterized by sparse rainfall, which occurs mainly in winter. Summers are hot and dry. Summertime maximum temperatures often exceed 100 degrees F in the Valley.

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[2] San Joaquin Valley Air Pollution Control District. *Guidance for Assessing and Mitigating Air Quality Impacts.* http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf. Pages 15-16. Accessed July 2020.
[3] Ibid. Page 16.

The subtropical high-pressure cell is strongest during spring, summer and fall and produces subsiding air, which can result in temperature inversions in the Valley. A temperature inversion can act like a lid, inhibiting vertical mixing of the air mass at the surface. Any emissions of pollutants can be trapped below the inversion. Most of the surrounding mountains are above the normal height of summer inversions (1,500-3,000 feet).

Winter-time high pressure events can often last many weeks with surface temperatures often lowering into the thirty-degree Fahrenheit range. During these events, fog can be present, and inversions are extremely strong. These wintertime inversions can inhibit vertical mixing of pollutants to a few hundred feet."[4]

Wind Patterns

"Wind speed and direction play an important role in dispersion and transport of air pollutants. Wind at the surface and aloft can disperse pollution by mixing and by transporting the pollution to other locations.

Especially in summer, winds in the Valley most frequently blow from the northwesterly direction. The region's topographic features restrict air movement and channel the air mass towards the southeastern end of the Valley. Marine air can flow into the basin from the San Joaquin River Delta and over Altamont Pass and Pacheco Pass, where it can flow along the axis of the valley, over the Tehachapi pass, into the Southeast Desert Air Basin. The Coastal Range is a barrier to air movement to the west and the high Sierra Nevada range is a significant barrier to the east (the highest peaks in the southern Sierra Nevada reach almost halfway through the Earth's atmosphere). Many days in the winter are marked by stagnation events where winds are very weak. Transport of pollutants during winter can be very limited. A secondary but significant summer wind pattern is from the southeasterly direction and can be associated with nighttime drainage winds, prefrontal conditions and summer monsoons.

Two significant diurnal wind cycles that occur frequently in the Valley are the sea breeze and mountain-valley upslope and drainage flows. The sea breeze can accentuate the northwest wind flow, especially on summer afternoons. Nighttime drainage flows can accentuate the southeast movement of air down the valley. In the mountains during periods of weak synoptic scale winds, winds tend to be upslope during the day and downslope at night. Nighttime and drainage flows are especially pronounced during the winter when flow from the easterly direction is enhanced

[4] San Joaquin Valley Air Pollution Control District. *Guidance for Assessing and Mitigating Air Quality Impacts.* http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf. Pages 17. Accessed July 2020.

by nighttime cooling in the Sierra Nevada. Eddies can form in the valley wind flow and can re-circulate a polluted air mass for an extended period."[5]

Temperature, Sunlight and Ozone Production

"Solar radiation and temperature are particularly important in the chemistry of ozone formation. The SJVAB averages over 260 sunny days per year. Photochemical air pollution (primarily ozone) is produced by the atmospheric reaction of organic substances (such as volatile organic compounds) and nitrogen dioxide under the influence of sunlight. Ozone concentrations are very dependent on the amount of solar radiation, especially during late spring, summer and early fall. Ozone levels typically peak in the afternoon. After the sun goes down, the chemical reaction between nitrous oxide and ozone begins to dominate. This reaction tends to scavenge the ozone in the metropolitan areas through the early morning hours, resulting in the lowest ozone levels, possibly reaching zero at sunrise in areas with high nitrogen oxides emissions. At sunrise, nitrogen oxides tend to peak, partly due to low levels of ozone at this time and also due to the morning commuter vehicle emissions of nitrogen oxides.

Generally, the higher the temperature, the more ozone formed, since reaction rates increase with temperature. However, extremely hot temperatures can "lift" or "break" the inversion layer. Typically, if the inversion layer doesn't lift to allow the buildup of contaminants to be dispersed, the ozone levels will peak in the late afternoon. If the inversion layer breaks and the resultant afternoon winds occur, the ozone will peak in the early afternoon and decrease in the late afternoon as the contaminants are dispersed or transported out of the SJVAB.

Ozone levels are low during winter periods when there is much less sunlight to drive the photochemical reaction."[6]

Temperature Inversions

"The vertical dispersion of air pollutants in the SJV can be limited by persistent temperature inversions. Air temperature in the lowest layer of the atmosphere typically decreases with altitude. A reversal of this atmospheric state, where the air temperature increases with height, is termed an inversion. The height of the base of the inversion is known as the "mixing height". This is the level to which pollutants can mix vertically. Mixing of air is minimized above and below

[5] Ibid. Page 18.

[6] San Joaquin Valley Air Pollution Control District. *Guidance for Assessing and Mitigating Air Quality Impacts.* http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf. Pages 18. Accessed July 2020.

the inversion base. The inversion base represents an abrupt density change where little air movement occurs.

Inversion layers are significant in determining pollutant concentrations. Concentration levels can be related to the amount of mixing space below the inversion. Temperature inversions that occur on the summer days are usually encountered 2,000 to 2,500 feet above the valley floor. In winter months, overnight inversions occur 500 to 1,500 feet above the valley floor."[7]

Precipitation, Humidity and Fog

"Precipitation and fog may reduce or limit some pollutant concentrations. Ozone needs sunlight for its formation, and clouds and fog can block the required solar radiation. Wet fogs can cleanse the air during winter as moisture collects on particles and deposits them on the ground. Atmospheric moisture can also increase pollution levels. In fogs with less water content, the moisture acts to form secondary ammonium nitrate particulate matter. This ammonium nitrate is part of the Valleys PM2.5 and PM10 problem.

The winds and unstable air conditions experienced during the passage of winter storms result in periods of low pollutant concentrations and excellent visibility. Between winter storms, high pressure and light winds allow cold moist air to pool on the SJV floor. This creates strong low-level temperature inversions and very stable air conditions, which can lead to Tule fog. Wintertime conditions favorable to fog formation are also conditions favorable to high concentrations of PM2.5 and PM10."[8]

Regulatory Setting

Federal Clean Air Act

Congress established much of the basic structure of the Clean Air Act (CAA) in 1970, and made major revisions in 1977 and 1990. Six common air pollutants (also known as criteria pollutants) are addressed in the federal CAA. These are particulate matter, ground-level ozone, carbon monoxide, sulfur oxides, nitrogen oxides, and lead. EPA calls these pollutants criteria air pollutants because it regulates them by developing human health-based and/or environmentally based criteria (science-based guidelines) for setting permissible levels. The

[7] San Joaquin Valley Air Pollution Control District. *Guidance for Assessing and Mitigating Air Quality Impacts.* http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf. Pages 19. Accessed July 2020.

[8] Ibid.

set of limits based on human health is called primary standards. Another set of limits intended to prevent environmental and property damage is called secondary standards.

The federal standards are called National Ambient Air Quality Standards (NAAQS). The air quality standards provide benchmarks for determining whether air quality is healthy at specific locations and whether development activities will cause or contribute to a violation of the standards. The criteria pollutants are:

- Ozone (O_3)
- Nitrogen dioxide (NO_2)
- Particulate matter (PM_{10} and $PM_{2.5}$)
- Carbon monoxide (CO)
- Sulfur dioxide (SO_2)
- Lead (Pb)

The NAAQS were set to protect public health, including that of sensitive individuals; thus, EPA is tasked with updating the standards as more medical research is available regarding the health effects of the criteria pollutants. Primary federal standards are the levels of air quality necessary, with an adequate margin of safety, to protect the public health.

The federal CAA requires states to adopt enforceable air quality plans to achieve the NAAQS. These attainment plans must also control emissions that drift across state lines and harm air quality in downwind states. Congress designed the law to minimize pollution increases from growing numbers of motor vehicles, and from new or expanded stationary sources. The Act requires new stationary sources to be built with best technology. The Act also contains specific provisions to address hazardous or toxic air pollutants, acid rain, ozone layer depleting chemical emissions, and regional haze. Congress also drafted the Act so that it could be used to address pollutions project that emerge over time, such as the effects of greenhouse gases on global climate change.[9]

California Clean Air Act

The California Legislature enacted the California Clean Air Act (CCAA) in 1988 to address air quality issues of concern not adequately addressed by the federal CAA at the time. The California Air Resources Board (CARB) administers California Ambient Air Quality Standards (CAAQS) for the 10 air pollutants designated in the CCAA. The 10 state air pollutants are the six federal

[9] United States Environmental Protection Agency. 2013. *The Clean Air Act in a Nutshell: How it Works.* Website: http://www.epa.gov/air/caa/pdfs/CAA_Nutshell.pdf. Accessed July 2020.

standards listed above as well as visibility-reducing particulates, hydrogen sulfide, sulfates, and vinyl chloride.

State Toxic Air Contaminant Programs

California regulates toxic air contaminants (TACs) primarily through the Tanner Act Toxics Act (AB 1807) (Tanner At) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588) (Hot Spots Act). The Tanner Act sets forth a formal procedure for CARB to designate substances as TACs. This includes research, public participation, and scientific peer review before CARB can designate a substance as a TAC. To date, CARB has identified over 21 TACs, and adopted the EPA's list of HAPs as TACs. Most recently, diesel exhaust particulate was added to the CARB list of TACs. Once a TAC is identified, CARB then adopts an Airborne Toxics Control Measure for sources that emits that particular TAC. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If there is no safe threshold, the measure must incorporate available best control technology (BACT) to minimize emissions. None of the TACs identified by CARB have a safe threshold.

The Hot Spots Act requires that existing facilities that emit toxic substances above a specified level:

1. Prepare a toxic emission inventory;
2. Prepare a risk assessment if emissions are significant;
3. Notify the public of significant risk levels;
4. Prepare and implement risk reduction measures.

CARB has adopted diesel exhaust control measures and more stringent emission standards for various on-road mobile sources of emissions, including transit buses, and off-road diesel equipment (e.g., tractors, generators). In February 2000, CARB adopted a new public transit bus fleet rule and emission standards for new urban buses. These new rules and standards provide for:

1. More stringent emission standards for some new urban bus engines beginning with 2002 model year engines,
2. Zero-emission bus demonstration and purchase requirements applicable to transit agencies, and
3. Reporting requirements with which transit agencies must demonstrate compliance with the urban transit bus fleet rule.

Notable milestones include the low sulfur diesel fuel requirement, and tighter emission standards for heavy-duty diesel trucks (2009) and off-road diesel equipment (2011) nationwide. Over time, the replacement of older vehicles will result in a vehicle fleet that produces substantially less TACs than under current conditions. Mobile-source emissions of TACs (e.g., benzene, 1-3 butadiene, diesel PM) have been reduced significantly over the last decade and will be reduced further in California through a progression of regulatory measures (e.g., Low Emission Vehicle/Clean Fuels and Phase II reformulated gasoline regulations) and control technologies. With implementation of CARB's Risk Reduction Plan, it is expected that diesel PM concentrations will be reduced by 75% in 2010 and 85% in 2020 from the estimated year 2000 level. Adopted regulations are also expected to continue to reduce formaldehyde emissions from cars and light—duty trucks. As emissions are reduced, it is expected that risks associated to exposure to the emissions will also be reduced.

San Joaquin Valley Air Pollution Control District

The San Joaquin Valley Air District (SJVAPCD) is a public health agency whose mission is to improve the health and quality of life for all Valley residents through efficient, effective and entrepreneurial air quality-management strategies. SJVAPCD's ten core values include: protection of public health; active and effective air pollution control efforts with minimal disruption to the Valley's economic prosperity; outstanding customer service; ingenuity and innovation; accountability to the public; open and transparent public process; recognition of the uniqueness of the Valley; continuous improvement; effective and efficient use of public funds; and respect for the opinions and interests of all Valley residents.[10] To achieve these core values the SJVAPCD has adopted air quality plans pursuant to the California CAA and a comprehensive list of rules to limit air quality impacts. The air plans currently in effect in the SJVAB and specific rules that apply to the proposed Project are listed and described further below.

The SJVAPCD is responsible for controlling emissions primarily from stationary sources. The SJVAPCD, in coordination with the eight countywide transportation agencies, is also responsible for developing, updating, and implementing air quality attainment plans for the SJVAB.

Attainment Plans

8-Hour Ozone Attainment Plan.

[10] San Joaquin Valley Air Pollution Control District. About the District. http://www.valleyair.org/General_info/aboutdist.htm#Mission. Accessed July 2020.

The Air Basin is designated an extreme ozone nonattainment area for the EPA's 2008 8-hour ozone standard of 75 ppb. The District's Governing Board approved the 2016 Plan for the 2008 8-Hour Ozone Standard on June 16, 2016. The ARB approved the attainment demonstration plan for the San Joaquin Valley on July 21, 2016 and transmitted the plan to EPA on August 24, 2016. The comprehensive strategy in this plan will reduce NOX emissions by over 60 percent between 2012 and 2031 and will bring the San Joaquin Valley into attainment of the EPA's 2008 8-hour ozone standard as expeditiously as practicable, no later than December 31, 2031. The 2016 Ozone Plan predicts attainment of the 2008 standard by 2031.[11] To ensure that the plan is approvable with the necessary contingencies, the plan includes a "Black Box" that will require implementation of new advanced technologies and controls prior to the 2031 deadline.

The federal Clean Air Act required areas designated nonattainment for ozone and classified moderate and above to implement Reasonably Available Control Technology (RACT), and as such, the SJVAPCD adopted the 2020 RACT Demonstration for the 2015 8-Hour Ozone Standard on June 18, 2020.

2.5 Particulate Matter Attainment Plan. The SJVAPCD adopted the 2018 Plan for the 1997, 2006, and 2012 PM2.5 Standards on November 15, 2018. This plan provides a combined strategy to address the EPA federal 1997 annual PM2.5 standard of 15 μg/m^3 and the 24-hour PM2.5 standard of 65 μg/m^3; the 2006 24-hour PM2.5 standard of 35 μg/m^3; and the 2012 annual PM2.5 standard of 12 μg/m^3. This plan demonstrates attainment of the federal PM2.5 standards as expeditiously as practicable.

Rules and Regulations

The following SJVAPCD rules and regulations that may apply to the proposed Project include but are not limited to the following:[12]

Rule 2280 – Portable Equipment Registration. This rule provides an administrative mechanism and establishes standards for registration of certain portable emissions units or operation at participating districts throughout the State of California.

[11] San Joaquin Valley Air Pollution Control District. 2016 Plan for the 2008 8-Hour Ozone Standard. http://valleyair.org/Air_Quality_Plans/Ozone-Plan-2016.htm. Accessed August 2020.
[12] San Joaquin Valley Air Pollution Control District. 2015. Current District Rules and Regulations. http://www.valleyair.org/rules/1ruleslist.htm. Accessed July 2020.

Rule 4002 – National Emissions Standards for Hazardous Air Pollutants. The purpose of the rule is to incorporate the National Emission Standards for Hazardous Air Pollutants from Part 61, Chapter I, Subchapter C, Title 40, Code of Federal Regulations and the National Emission Standards for Hazardous Air Pollutants for Source Categories from Part 63, Chapter I, Subchapter C, Title 40, Code of Federal Regulations to protect the health and safety of the public from HAPs, such as asbestos.

Rule 4102 – Nuisance. The purpose of this rule is to protect the health and safety of the public and applies to any source operation that emits or may emit air contaminants or other materials.

Rule 4601 – Architectural Coatings. The purpose of this rule is to limit Volatile Organic Compounds (VOC) emissions from architectural coatings. Emissions are reduced by limits on VOC content of the various coatings and by requirements on coatings storage, cleanup, and labeling.

Rule 4641 – Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations. The purpose of this rule is to limit VOC emissions from asphalt paving and maintenance operations. If asphalt paving will be used, then the paving operations will be subject to Rule 4641.

Rule 4701 – Internal Combustion Engines – Phase 1. The purpose of this rule is to limit the emissions of nitrogen oxides, carbon monoxide, and volatile organic compounds from internal combustion engines.

Rule 9510 – Indirect Source Review (ISR). The purposes of this rule are to fulfill the District's emission reduction commitments in the PM10 and Ozone Attainment Plans, achieve emission reductions from the construction and use of development projects through design features and on-site measures, and provide a mechanism for reducing emissions from the construction of and use of development projects through off-site measures.

Regulation VIII – Fugitive PM10 Prohibitions. Rules 8011-8081 are designed to reduce PM10 emissions (predominantly dust/dirt) generated by human activity, including construction and demolition activities, road construction, bulk materials storage, paved and unpaved roads, carryout and track-out, etc. All development projects that involve soil disturbance are subject to at least one provision of the Regulation VIII series of rules.

Role in CEQA

As a public agency, the SJVAPCD takes an active part in the intergovernmental review process under CEQA. In carrying out its duties under CEQA, the SJVAPCD may act as a Lead Agency,

a Responsible Agency, or a Trustee/Commenting Agency depending on the approvals required by the District and other land use agencies.

"The District is always the Lead Agency for projects such as the development of District rules and regulations. The District may be Lead Agency for projects subject to District permit requirements. As discussed above, for projects triggering BACT, the District has discretionary approval in deciding how to permit the project. For projects subject to BACT, the District serves as Lead Agency when no other agency has principal responsibility for approving the project."[13]

"As a Responsible Agency, the District assists Lead Agencies by providing technical expertise in characterizing project-related impacts on air quality and is available to provide technical assistance in addressing air quality issues in environmental documents. When commenting on a Lead Agency's environmental analysis, the District reviews the air quality section of the analysis and other sections relevant to assessing potential impacts on air quality (i.e., sections assessing public health impacts). At the conclusion of its review the District may submit to the Lead Agency comments regarding the project air quality analysis. Where appropriate, the District will recommend feasible mitigation measures."[14]

As a Trustee Agency, the District assists Lead Agencies by providing technical expertise or tools in characterizing project-related impacts on air quality and identifying potential mitigation measures, and is available to provide technical assistance in addressing air quality issues in environmental documents. At the conclusion of its review the District may submit to the Lead Agency comments regarding the project air quality analysis. Where appropriate, the District will recommend feasible mitigation measures. The process is subject to change due to the District's continuous improvements efforts."[15]

As mentioned above, the SJVAPCD provides technical expertise and tools in characterizing project-related impacts. As this Project is a development plan to guide the growth of the community, it has no specific development project associated with it. As such, as new developments are identified, the County will work with the SJVAPCD through the CEQA process to identify and mitigate, if necessary, any potential adverse impacts to air quality.

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[13] San Joaquin Valley Air Pollution Control District. *Guidance for Assessing and Mitigating Air Quality Impacts.* Page 50. http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf.. Accessed July 2020.

[14] Ibid.

[15] Ibid. Page 51.

Existing Conditions

The SJVAPCD, the California Air Resources Board (CARB), and the U.S. National Park Service, and the Santa Rosa Rancheria in Lemoore operate an extensive air monitoring network to measure progress toward attainment of the EPA-established National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS). Ambient Air Quality Standards can be seen in Table 3.3-1, along with the potential pollutant health and atmospheric effects and sources.

Table 3. 3-1 – National and State Ambient Air Quality Standards and Effects and Sources of Pollutants[16]

Pollutant	Averaging Time	State Standard	National Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Ozone	1 hour	0.09 ppm	---	(a) Decrease of pulmonary function and localized lung edema in humans and animals; (b) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (c) Increased mortality risk; (d) Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (e) Vegetation damage; (f) Property damage.	Formed when reactive organic gases (ROG) and nitrogen oxides (NO_X) react in the presence of sunlight. Major sources include on-road motor vehicles, solvent evaporation, and commercial / industrial mobile equipment.
	8 hours	0.07 ppm[1]	0.070 ppm		
Carbon Monoxide	1 hour	20 ppm	35 ppm	(a) Aggravation of angina pectoris (chest pain) and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c)	Internal combustion engines, primarily gasoline-powered motor vehicles.
	8 hours	9.0 ppm	9.0 ppm		

[16] California Environmental Protection Agency Air Resources Board. Ambient Air Quality Standards. http://www.arb.ca.gov/research/aaqs/aaqs.htm. Accessed July 2020.

Pollutant	Averaging Time	State Standard	National Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
				Impairment of central nervous system functions; (d) Possible increased risk to fetuses.	
Nitrogen Dioxide	1 hour	0.180 ppm	0.100 ppm	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; (c) Contribution to atmospheric discoloration - Colors atmosphere reddish-brown.	Motor vehicles, petroleum refining operations, industrial sources, aircraft, ships, and railroads.
	Annual Avg.	0.030 ppm	0.053 ppm		
Sulfur Dioxide	1 hour	0.25 ppm	75 ppb	Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma. Some population-based studies indicate that the mortality and morbidity effects associated with fine particles show a similar association with ambient sulfur dioxide levels. It is not clear whether the two pollutants act synergistically or one pollutant alone is the predominant factor.	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
	3 hours	---	0.5 ppm		
	24 hours	0.04 ppm	0.14 ppm		
	Annual Avg.	---	0.03 ppm		
Respirable Particulate Matter (PM10)	24 hours	50 µg/m^3	150 µg /m^3	(a) Exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) Declines in pulmonary function growth in children; (c) Increased risk of premature death from heart or lung diseases in the elderly. Daily fluctuations in PM2.5 levels have been related to hospital admissions	Dust and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
	Annual Avg.	20 µg/m^3	---		
	24 hours	---	35 µg /m^3		

Pollutant	Averaging Time	State Standard	National Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Fine Particulate Matter (PM2.5)	Annual Avg.	12 μg/m^3	12 μg /m^3	for acute respiratory conditions, school absences, and increased medication use in children and adults with asthma.	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning; Also, formed from photochemical reactions of other pollutants, including NO_X, sulfur oxides, and organics.
Lead	Rolling 3-Month Average NAAQS/Monthly Avg. State	1.5 μg/m^3	0.12 μg /m^3	Lead accumulates in bones, soft tissue, and blood and can affect the kidneys, liver, and nervous system. It can cause impairment of blood formation and nerve conduction. The more serious effects of lead poisoning include behavior disorders, mental retardation, neurological impairment, learning deficiencies, and low IQs. Lead may also contribute to high blood pressure and heart disease.	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.
	Quarterly	---	1.5 μg /m^3		
Hydrogen Sulfide	1 hour	0.03 ppm	No National Standard	High levels of hydrogen sulfide can cause immediate respiratory arrest. It can irritate the eyes and respiratory tract and cause headache, nausea, vomiting, and cough. Long exposure can cause pulmonary edema.	Geothermal Power Plants, Petroleum Production and refining
Sulfates	24 hour	25 μg/m^3	No National Standard	(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; (f) Property damage.	Produced by the reaction in the air of SO_2.
Visibility Reducing Particles	8 hour	Extinction of 0.23/km; visibility	No National Standard	Reduces visibility, reduced airport safety, lower real estate value, and discourages tourism.	See PM2.5.

Pollutant	Averaging Time	State Standard	National Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
		of 10 miles or more			

ppm = parts per million; mg/m^3 = micrograms per cubic meter.

[1] This concentration was approved by the Air Resources Board on April 28, 2005 and became effective May 17, 2006.

The EPA and the CARB designate air basins where ambient air quality standards are exceeded as "nonattainment" areas. If standards are met, the area is designated as an "attainment" area. If there is inadequate or inconclusive data to make a definitive attainment designation, they are considered "unclassified." National nonattainment areas are further designated as marginal, moderate, serious, severe, or extreme as a function of deviation from standards. Current attainment designations for the SJVAB are provided in Table 3.3-2.

Table 3.3-2 – San Joaquin Valley Attainment Status[17]

Pollutant	Designation	
	Federal Standards	State Standards
Ozone- 1 hr	No Federal Standard	Nonattainment/Severe
Ozone- 8 hr	Nonattainment/Extreme	Nonattainment
PM10	Attainment	Nonattainment
PM2.5	Nonattainment	Nonattainment
Carbon monoxide	Attainment/Unclassified	Attainment/Unclassified
Nitrogen dioxide	Attainment/Unclassified	Attainment
Sulfur dioxide	Attainment/Unclassified	Attainment
Lead (Particulate)	No Designation/Classification	Attainment
Hydrogen sulfide	No Federal Standard	Unclassified

[17] San Joaquin Valley Air Pollution Control District. 2016. Ambient Air Quality Standards & Valley Attainment Status. https://www.valleyair.org/aqinfo/attainment.htm. Accessed July 2020.

Sulfates	No Federal Standard	Attainment
Visibility-reducing particles	No Federal Standard	Unclassified
Vinyl chloride	No Federal Standard	Attainment

Toxic Air Contaminant Health Effects

A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations.

The California Almanac of Emissions and Air Quality presents the relevant concentration and cancer risk data for the ten TACs that pose the most substantial health risk in California based on available data. The ten TACs are acetaldehyde, benzene, 1.3-butadiene, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, perchloro-ethylene, and diesel particulate matter (DPM).[18]

Some studies indicate that DPM poses the greatest health risk among the TACs listed above. A 10-year research program demonstrated that DPM from diesel-fueled engines is a human carcinogen and that chronic (long-term) inhalation exposure to DPM poses a chronic health risk.[19] DPM emissions are estimated to be responsible for about 70 percent of the total ambient air toxics risk.[20] In addition to increasing the risk of lung cancer, exposure to diesel exhaust can have other health effects. Diesel exhaust can irritate the eyes, nose, throat, and lungs, and it can cause coughs, headaches, lightheadedness, and nausea. Diesel exhaust is a major source of fine particulate pollution as well, and studies have linked elevated particle levels in the air to increased hospital a dmissions, emergency room visits, asthma attacks, and premature deaths among those suffering from respiratory problems.

Limited data on levels and health risks attributable to the top 10 TACs listed above are available from the CARB as part of their California Almanac of Emissions and Air Quality - 2009 Edition. As shown therein for data collected at the California Avenue air monitoring station in

[18] California Air Resources Board. The California Almanac of Emissions and Air Quality – 2013 Edition. https://www.arb.ca.gov/aqd/almanac/almanac13/almanac13.htm. Accessed July 2020.
[19] California Air Resources Board. 1998. *The Toxic Air Contaminant Identification Process: Toxic Air Contaminant Emissions from Diesel-fueled Engines*. www.arb.ca.gov/toxics/dieseltac/factsht1.pdf. Accessed July 2020.
[20] California Air Resources Board. 2000. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-fueled Engines and Vehicles*. http://www.arb.ca.gov/diesel/documents/rrpfinal.pdf. Accessed July 2020.

Bakersfield, cancer risks attributable to all of the listed TACs above with the exception of DPM have declined about 70 percent from the mid-1990s to 2007. Unfortunately, risks associated with DPM emissions are only provided for the year 2000 and have not been updated in the Almanac. The cancer risk from DPM alone was reported at 390 in a million in 2000 with a total risk from all TACs of 586 in a million.[21] According to the California Almanac of Emissions and Air Quality - 2013 Edition, overall statewide DPM emissions are forecasted to decline by 71 percent between 2000 and 2035 and in the SJVAB DPM is forecasted to decline by approximately 72 percent between 2010 and 2035.[22]

Odors

Although offensive odors rarely cause any physical harm, they can be very unpleasant, leading to considerable stress among the public. Common types of facilities that have been known to produce odors include wastewater treatment facilities, chemical manufacturing plants, feed lots/dairies, composting facilities, landfills, and transfer stations. Odor impacts on residential areas and sensitive receptors are often closely scrutinized and consideration should be given to other land uses that are commonly used by large amounts of people, such as open space, recreational facilities and commercial centers. The GAMAQI states that an evaluation should be conducted for both of the following situations: 1) a potential source of objectionable odors is proposed for a location near existing sensitive receptors, and 2) sensitive receptors are proposed to be located near an existing source of objectionable odors.

Sensitive Receptors

The SJVAPCD defines Sensitive Receptors as "People that have an increased sensitivity to air pollution or environmental contaminants. Sensitive receptor locations include schools, parks and playgrounds, day care centers, nursing homes, hospitals, and residential dwelling unit(s). The location of sensitive receptors is needed to assess toxic impacts on public health."[23]

"The location of a development project is a major factor in determining whether the project will result in localized air quality impacts. The potential for adverse air quality impacts increases as the distance between the source of emissions and receptors decreases. Receptors include sensitive receptors and worker receptors. Sensitive receptors refer to those segments of the population

[21] California Air Resources Board. The California Almanac of Emissions and Air Quality. 2009 Edition. San Joaquin Valley Air Basin Annual Average Concentrations and Health Risks. Page 5-69. https://www.arb.ca.gov/aqd/almanac/almanac09/almanac2009all.pdf. Accessed July 2020.
[22] California Air Resourced Board. 2013b. *The California Almanac of Emissions and Air Quality – 2013 Edition.* http://www.arb.ca.gov/aqd/almanac/almanac13/almanac13.htm. Accessed July 2020.
[23] SJVAPCD. GAMAQI. http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf. Page 10. Accessed July 2020.

most susceptible to poor air quality (i.e., children, the elderly, and those with pre-existing serious health problems affected by air quality). Land uses where sensitive individuals are most likely to spend time include schools and schoolyards, parks and playgrounds, daycare centers, nursing homes, hospitals, and residential communities (these sensitive land uses may also be referred to as sensitive receptors). Worker receptors refer to employees and locations where people work. Impacts on sensitive receptors are of particular concern, because they are the people most vulnerable to the effects of air pollution.

From a health risk perspective there are basically two types of land use projects that have the potential to cause long-term public health risk impacts:

- Type A Projects: Land use projects that will place new toxic sources in the vicinity of existing receptors, and
- Type B Projects: Land use projects that will place new receptors in the vicinity of existing toxics sources."[24]

Thresholds of Significance

Consistent with Appendix G of the CEQA Guidelines, the proposed Project will have a significant impact on the environment associated with air quality if it will:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard;
- Expose sensitive receptors to substantial pollutant concentrations;
- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

The SJVAPCD is the applicable air pollution control district for the San Joaquin Valley Air Basin, which includes the proposed Project area. The SJVAPCD recommends air pollution thresholds that can be used by Lead Agencies in determining whether a proposed project could result in a significant air quality and health risk impacts in responding to the Appendix G CEQA Guideline thresholds shown above. These thresholds are designed to ensure that an individual new source does not contribute to, cause a violation of an ambient air quality standard, or expose sensitive receptors to substantial levels of air pollution as an individual project or cumulatively with other

[24] Ibid. Page 44.

current and projected projects. The values of the individual significance thresholds have been defined based on scientific research and studies by the CARB and EPA and are protective of public health. If a project has the potential to exceed any adopted significance threshold, then the project should be considered significant.

Criteria Pollutant Significance Thresholds

To assess potential air quality impacts, Criteria pollutant significance thresholds follow two specifications: emission-based and air concentration-based. The SJVAPCD has established significance thresholds to assist Lead Agencies in determining whether a project may have a significant impact on air quality. [25] Table 3.3-3 provides the criteria pollutant significant thresholds as identified in the SJVAPCD's Guidance for Assessing and Mitigating Air Quality Impacts (GAMAQI).

The SJVAPCD has three sets of significance thresholds based on the source of the emissions. According to the GAMAQI, "The District identifies thresholds that separate a project's short-term emissions from its long-term emissions. The short-term emissions are mainly related to the construction phase of a project and are recognized to be short in duration. The long-term emissions are mainly related to the activities that will occur indefinitely as a result of project operations."[26]

Table 3.3-3 – District Criteria Pollutant Significance Thresholds[27]

Pollutant/ Precursor	**Construction Emissions**	Operational Emissions	
		Permitted Equipment and Activities	**Non-Permitted Equipment and Activities**
	Emissions (tpy)	**Emissions (tpy)**	Emissions (tpy)
CO	100	100	**100**
NOx	10	10	**10**
ROG	10	10	**10**
SOx	27	27	**27**
PM10	15	15	**15**
PM2.5	**15**	**15**	**15**

[25] San Joaquin Valley Air Pollution Control District. Guidance for Assessing and Mitigating Air Quality Impacts. March 19, 2015. Page 80, Table 2.

[26] San Joaquin Valley Air Pollution Control District. Guidance for Assessing and Mitigating Air Quality Impacts. March 19, 2015. Page 75.

[27] Ibid. Page 80, Table 2.

Odor Significance Thresholds

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

Two situations create a potential for odor impact. The first occurs when a new odor source is located near an existing sensitive receptor. The second occurs when a new sensitive receptor locates near an existing source of odor. The SJVAPCD has determined the common land use types that are known to produce odors in the Basin. These types are shown in Table 3.3-4.

Table 3.3-4 – District Screening Levels for Potential Odor Sources[28]

Odor Generator	Distance
Wastewater Treatment Facilities	2 miles
Sanitary Landfill	1 mile
Transfer Station	1 mile
Composting Facility	1 mile
Petroleum Refinery	2 miles
Asphalt Batch Plant	1 mile
Chemical Manufacturing	1 mile
Fiberglass Manufacturing	1 mile
Painting/Coating Operations (e.g., auto body shop)	1 mile
Food Processing Facility	1 mile
Feed Lot/Dairy	1 mile
Rendering Plant	1 mile

According to the District's GAMAQI, analysis of potential odor impacts should be conducted for the following two situations:[29]

[28] San Joaquin Valley Air Pollution Control District. Guidance for Assessing and Mitigating Air Quality Impacts. March 19, 2015. Page 103.
[29] Ibid. Page 102

- Generators - projects that would potentially generate odorous emissions proposed to locate near existing sensitive receptors or other land uses where people may congregate, and
- Receivers - residential or other sensitive receptor projects or other projects built for the intent of attracting people locating near existing odor sources.

For a project locating near an existing source of odors, the project should be identified as having a potentially significant odor impact if it is proposed for a site that is closer to an existing odor source than any location where there have been:

- More than one confirmed complaint per year averaged over a three-year period, or
- Three unconfirmed complaints per year averaged over a three-year period.

Projects meeting these criteria would provide an odor assessment to determine if the odor issues from the facilities have been resolved or if mitigation measures are available to reduce odor impacts to future residents.

Air Quality Methods

Air quality impacts were evaluated through identification of all potential air emission sources associated with the proposed Project, evaluation of potential emissions, evaluation of existing requirements for their control, and determination of onsite measures to reduce them to less-than-significant levels. The Road Construction Emissions Model (RCEM), Version 9.0.0 and the California Emissions Estimator Model (CalEEMod) was used to evaluate air quality effects and to help determine potential mitigation measures.

Impacts and Mitigation Measures

Impact 3.3-1: *Conflict with or obstruct implementation of the applicable air quality plan*?

Less Than Significant.

Construction Emissions

Construction of the proposed Project would cause short-term air pollutant emissions. Activities associated with the spillway raise were estimated using the RCEM, Version 9.0.0 while activities associated with the SCE transmission line components were estimated using assumptions and emission factors consistent with CalEEMod. Vehicle emissions were estimated using emission

factors from EMFAC2014[30] while helicopter emissions calculations used emission factors derived from the Federal Aviation Administration Aircraft Engine Emissions Database and emissions are included with the SCE project components. Fugitive dust emissions were estimated using equations from EPA AP-42, Chapter 13.2, and other approved references. Table 3.3-5 compares the estimated construction emissions for the proposed Project to SJVAPCD construction emission thresholds. All modeling output files are provided in Appendix A.

Table 3.3-5. Estimated Maximum Annual Construction Emissions for the Proposed Project

	CO	NO_x	ROG	PM_{10}	$PM_{2.5}$	SOx
SCE Project Components Rolling 12-Month Construction Emissions (tons/year)	2.06	1.83	0.37	7.21	0.75	0.05
Spillway Raise Components Rolling 12-Month Construction Emissions (tons/year)	20.11	3.19	1.01	4.36	1.01	0.04
Total Rolling Project Emissions	**22.17**	**5.02**	**1.38**	**11.57**	**1.76**	**0.09**
SJVAPCD Threshold	100	10	10	15	15	27
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Notes: PM_{10} and $PM_{2.5}$ emissions considered a fugitive dust control efficiency of 55 percent for travel on unpaved roads for watering twice a day during construction. Also note that the Table assumes that SCE Project components and Spillway Raise components maximum 12-month emission values will occur during the same calendar month, which is not likely and is a worst-case scenario.

As shown in Table 3.3-5, annual construction emissions from the proposed Project would be below the SJVAPCD construction emission thresholds with mitigation incorporated. Because the thresholds were developed consistent with the regional air quality goals and emission reduction strategies, the estimated emissions from the proposed Project indicate that the proposed Project would not conflict or obstruct regional air quality plans. In addition, construction of the proposed Project would comply with applicable CARB and SJVAPCD rules and regulations, including SJVAPCD Regulation VIII requirements to control fugitive dust emissions.

[30] California Air Resources Board (CARB). 2014. EMFAC2014 Web Database. https://www.arb.ca.gov/emfac/2014/. Accessed July 2020.

Operational Emissions

Operation of the proposed Project would require infrequent use of equipment and vehicles for maintenance purposes each year; therefore, operational emissions from the proposed Project would be negligible and would not exceed the SJVAPCD CEQA thresholds. The proposed Project would be exempt from the SJVAPCD ISR Rule, because it would not increase capacity; rather it would replace existing facilities to mitigate structural impacts caused by increasing water levels of Lake Success.

In summary, the proposed Project emissions would be less than the CEQA thresholds during operation and less than the CEQA thresholds during construction with the incorporation of mitigation measures. Proposed Project construction would comply with the applicable CARB and SJVAPCD rules, including Regulation VIII requirements for fugitive dust emission control. Because SJVAPCD regulations and CEQA thresholds were developed to be consistent with the goals of the regional air quality plans, the proposed Project would not conflict or obstruct implementation of the applicable air quality plans.

Based on this information, the proposed Project would be consistent with the regional and local air quality planning strategy, would not conflict with or obstruct implementation of the applicable air quality plans. Impacts of the proposed Project would be ***less than significant***, with the incorporation of mitigation measures.

Impact 3.3-2: *Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard?*

Less Than Significant Impact. CEQA defines cumulative impacts as two or more individual effects which, when considered together, are either significant or "cumulatively considerable," meaning they add considerably to a significant environmental impact. An adequate cumulative impact analysis considers a project over time and in conjunction with other past, present, and reasonably foreseeable future projects whose impacts might compound those of the project being assessed.

Construction

Under NAAQS, Tulare County is currently designated as nonattainment for O_3 and $PM_{2.5}$ standards, and attainment/maintenance for the PM_{10} standards. Under CAAQS, the area is currently designated as nonattainment for O_3, PM_{10}, and $PM_{2.5}$. Although the proposed Project

would have emissions of the O_2 precursors (NO_x and ROG), PM_{10}, and $PM_{2.5}$, as discussed in the previous section, air quality impacts due to construction emissions would be temporary and fall below established significant thresholds with mitigation incorporated. Impacts are less than significant.

Operation

Operational emissions related to the proposed Project would be negligible. The proposed Project is located in a rural area, miles away from the nearest city that has other stationary or mobile emission sources. Therefore, the emissions from the proposed Project operations are not expected to be cumulatively significant because of the distance between the proposed Project site and other existing or potential future emission sources or other projects. Therefore, the proposed Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the proposed Project region is nonattainment under an applicable federal or state ambient air quality standard; air quality impacts would be ***less than significant***.

Impact 3.3-3: *Would the project expose sensitive receptors to substantial pollutant concentrations?*

Less Than Significant Impact. Sensitive receptors include receptors such as residences, schools, daycare centers, nursing homes, and hospitals. The proposed Project area is surrounded by agricultural land uses, with sparsely scattered residences. The nearest residence is approximately 1,000 feet from the construction area, and the nearest school and hospital are more than 2 miles from the construction area, in the City of Porterville.

Construction

As discussed previously, proposed Project construction emissions would be temporary and less than the SJVAPCD emission thresholds with mitigation implemented. Proposed Project operations would result in negligible emission increases. Therefore, the proposed Project would not expose sensitive receptors to substantial concentrations of criteria pollutants.

Temporary exhaust emissions from construction equipment would contain carcinogenic TACs, such as particulate matter from diesel exhaust (DPM), which have the potential to cause cancer under conditions of long-term, continuous exposure. The nearest sensitive receptor to the spillway is a residential home, located approximately 1,000 feet away while the nearest sensitive receptor to the substation site staging yard is approximately 1,000 feet away. The nearest sensitive receptor to the transmission line is approximately 2,000 feet away. Exposures to the TAC emissions from the construction activities would be short-term, and long-term exposure to DPM

from construction would not occur. As discussed in earlier sections, emissions of PM_{10} and $PM_{2.5}$ would be temporary and fall below established significant thresholds. Therefore, impacts would be less than significant.

Operation

Operational emissions from the proposed Project associated with infrequent equipment and vehicle use are negligible. Therefore, the proposed Project would not expose sensitive receptors to substantial pollutant concentrations during construction or operations. The proposed Project would have ***less than significant impacts*** on the nearby sensitive receptors.

Impact 3.3-4: *Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?*

Less than Significant Impact.

Construction

During proposed Project construction, objectionable odors could occur because of exhaust from diesel-powered equipment. Such odors, however, would be short term and limited to the immediate vicinity of the proposed Project site. Because the proposed Project site is located in a rural area and residences are sparse near the site, odorous emissions, if any, would not affect a substantial number of people. Therefore, odor impacts during construction would be temporary and less than significant.

Operation

Odor emissions would be negligible during Project operations because of the minimal amount of equipment needed and the infrequent maintenance needs. Therefore, air quality impacts associated with odors would be ***less than significant.***

Mitigation Measures:

The mitigation measures listed below are assigned to either the Lead Agency or SCE. The Lead Agency will be responsible for implementation and compliance with the measures listed under "New Mitigation Measures proposed by Lead Agency" and SCE will be responsible for

implementation and compliance with the measures listed under "New Mitigation Measures proposed by SCE (Utility Modifications)".

1999 FEIS/FEIR: This topic was evaluated in the 1999 FEIS/FEIR. No mitigation measures pertaining to this topic were identified.

New Mitigation Measures proposed by Lead Agency:

AIR-1 **Construction Emission Control Practices**. The construction contractor shall be required to implement basic construction emission control practices, fugitive dust mitigation measures, and enhanced fugitive dust control practices include but not limited to the following:

- Water all exposed surfaces at least two times daily.
    i. Exposed surfaces include, but are not limited to soil piles, graded areas, unpaved parking areas, staging areas, and access roads.
    ii. In areas of active construction activities, water at least every 2 hours, or sufficiently often to keep disturbed areas adequately wet to the depth of activity, but do not overwater to the extent that sediment flows off the project site.
- Use wet power vacuum street sweepers, such as a HEPA filter-equipped vacuum device, to remove any visible track out mud or dirt onto adjacent public roads at least once a day. Use of dry power sweeping is prohibited.
- Cover or maintain at least two feet of free board space on haul trucks transporting soil, sand, or other loose material on the site. Any haul trucks that would be traveling along freeways or major roadways should be covered.
- Limit vehicle speeds on unpaved roads to 15 miles per hour (mph).
    i. Install one or more of the following track-out prevention measures: a gravel pad to clean the tires of exiting vehicles, tire shakers, pavement extensions of at least 50 feet from paved public intersections, wheel washers for all exiting trucks, wash off all trucks and equipment leaving the site, or any other measure(s) as effective as the measures listed above.

ii. Treat site access to a distance of 100 feet from the paved road with a 6 to 12-inch layer of wood chips, mulch, or gravel to reduce generation of road dust and road dust carryout onto public roads.

- Minimize idling time either by shutting equipment off when not in use or reducing the time of idling to five minutes (as required by the state airborne toxics control measure [Title 13, Sections 249(d)(3) and 2485 of the California Code of Regulations]).
- Provide clear signage that posts this requirement for workers at the entrances to the site.

i. Post a publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints. This person would respond and take corrective action within 48 hours of receiving a complaint.

- Maintain all construction equipment in proper working condition according to manufacturer's specifications. The equipment must be checked by a certified mechanic and determine to be running in proper condition before it is operated.

AIR-2 **Enhanced Exhaust Control Practices.** The construction contractor shall be required to implement the following enhanced exhaust control practices:

- Provide a plan for approval by the Corps demonstrating that the heavy-duty (50 horsepower (hp) or more) off-road vehicles to be used in the construction project, including owned, leased, and subcontractor vehicles, would achieve a project-wide fleet-average 20 percent NOx reduction and 45 percent particulate reduction compared to the most recent CARB fleet average.
- Acceptable options for reducing emissions may include use of late model engines, low emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, and/or other options as they become available. Per conversation with SJVAPCD, the SMAQMD's Construction Mitigation Calculator can be used to identify an equipment fleet that achieves this reduction. The subject plan would be submitted in conjunction with the equipment inventory discussed below.

- Submit to the lead agency and Corps a comprehensive inventory of all off-road construction equipment, equal to or greater than 50 hp, that would be used an aggregate of 40 or more hours during any portion of the construction project. The inventory would include the hp rating, engine model year, and projected hours of use for each piece of equipment. The inventory would be updated and submitted monthly throughout the duration of the project, except that an inventory would not be required for any 30-day period in which no construction activity occurs. At least 4 business days hours prior to the use of subject heavy-duty off-road equipment, the contractor would provide Corps with the anticipated construction timeline including start date, and name and phone number of the project manager and on-site foreman. Per conversation with SJVAPCD, the SMAQMD's Model Equipment List can be used to submit this information.

- Ensure that emissions from all off-road diesel-powered equipment used on the project site do not exceed 40 percent opacity for more than 3 minutes in any 1 hour. Any equipment found to exceed 40 percent opacity (or Ringelmann 2.0) would be repaired immediately. Non-compliant equipment would be documented and a summary provided to the lead agency and Corps monthly. A visual survey of all in-operation equipment would be made at least weekly, and a monthly summary of the visual survey results would be submitted throughout the duration of the project, except that the monthly summary would not be required for any 30-day period in which no construction activity occurs. The monthly summary would include the quantity and type of vehicles surveyed as well as the dates of each survey.

AIR-3 **Additional Air Quality Mitigation Measures**. The following mitigation measures would continue to be implemented to reduce the potential adverse air quality effects of the project. The construction contractor shall be required to comply with the following:

- All off-road diesel-powered construction equipment greater than 50 hp would meet Tier-4 off road emission standards (reference 40 CFR Part 1039), where available.

- In addition, if not already supplied with a factory-equipped diesel particulate filter, all construction equipment would be outfitted with Best Available Control Technology (BACT) devices certified by CARB. Any emissions control device used by the construction contractor would achieve emissions reductions that are no less than what could be achieved by a Level 3 diesel emissions control strategy for a similarly sized engine as defined by CARB regulations. In the event that a certain tier engine is not available for any off-road equipment larger than 50 hp, that equipment would be equipped with the next lower tier engine (e.g., if Tier 3 is not available use Tier 2), or an engine that is equipped with retrofit controls to reduce exhaust emissions of NOx and diesel PM to no more than the next available tier, unless certified by engine manufacturers that the use of such devices is not practical for specific engine types. If the construction contractor proposes to use off-road diesel powered construction equipment greater than 50 hp that does not meet Tier 4 off road emissions standards, such usage would first have to be approved by the Corps.
- Construction equipment would incorporate emissions-reducing technology such as specific fuel economy standards. Idling would be restricted to a maximum of 5 minutes, except as provided in the CARB 13CCR, Section 2485 exceptions.

New Mitigation Measures proposed by SCE (Utility Modifications): No new or additional mitigation measures are necessary pertaining to air quality.

Cumulative Impacts:

The scope for considering cumulative impacts to air quality resources is the San Joaquin Valley Air Basin. Although the proposed Project would generate emissions, as discussed in the previous section, air quality impacts due to construction emissions would be temporary and fall below established significant thresholds with mitigation incorporated.

Operational emissions related to the proposed Project would be negligible, as the Project involves modification and/or replacement of existing facilities. The proposed Project is located in a rural

area, miles away from the nearest city that has other stationary or mobile emission sources. Therefore, the emissions from the proposed Project operations are not expected to be cumulatively significant because of the distance between the proposed Project site and other existing or potential future emission sources or other projects. As such, cumulative impacts are considered ***less than cumulatively considerable***.

3.4 Biological Resources

This section of the SEIR evaluates the potential impacts to Biological Resources associated with implementation of the proposed Project. One NOP comment was received pertaining to Biological Resources from the California Department of Fish & Wildlife (CDFW). The comment letter outlined CDFW's requirements for biological evaluation and provided information on potential species that could occupy the region in which the Project is located.

Determination of Adequacy of 1999 FEIS/FEIR

The proposed Project footprint and area of potential effect (APE), as well as the proposed new maximum gross pool elevation raise has not changed since evaluation in the 1999 FEIS/FEIR. Amendments to the analysis of Biological Resources have occurred since the 1999 FEIR/FEIR so therefore, the following determinations are made:

Topic	Further Analysis Required?	1999 FEIS/FEIR Analysis Sufficient?
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service?	✓	
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service?	✓	
c. Have a substantial adverse effect on state or federally-protected wetlands (including, but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;	✓	

d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery site?	✓	
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	✓	
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	✓	

Discussion:

Impacts to biological resources were evaluated in the 1999 FEIS/FEIR; however, there are several factors that require updated and/or additional biological analysis. These factors include amendments to the CEQA Guidelines Appendix G checklist, updated protected species lists, and outdated biological survey information. As such, updated surveys were performed and this SEIR evaluates potential Project-related impacts to biological resources.

Environmental Setting

The proposed Project is located in the central portion of the San Joaquin Valley, within the foothills of the Sierra Nevada Mountain Range approximately 6 miles east of the City of Porterville, Tulare County, California. The proposed Project is located within the United States Geological Survey (USGS) 7.5-minute Success Dam quadrangle. Elevations of the Project site range from 650 feet to 700 feet above sea level.

Habitat types found in Tulare County include alpine habitat, annual grassland, barren, chaparral, conifer woodland, conifer forest, hardwood/conifer forest, hardwood forest, desert scrub, mixed riparian, urban, vineyard/cropland, open water, and wetlands. The primary habitat types found around Lake Success are annual grassland, open water, and vineyard/cropland.

A total of three eco-region sections exist in Tulare County. These sections apportion the County in a west to east pattern. The majority of the western eco-region of the County comprises the Great Valley Section, the majority of the eastern eco-region of the county is in the Sierra Nevada Section, and a small eco-region between these two sections comprises the Sierra Nevada Foothill Section (USFS 2005). Lake Success lies in the Great Valley Section.

The natural vegetation of the Great Valley Section is predominately characterized by the purple needlegrass series, valley oak series, vernal pools and wetland communities, and blue oak series. Fauna associated with this eco-region include mule deer, black-tailed deer, coyotes, jackrabbits, kangaroo rats, kit fox, and muskrats. Birds include waterfowl, hawks, bald eagles, owls, white-tailed kites, herons, western meadowlark, and quail (USFS 2005). Least Bell's vireo was detected in the woodland near the North Fork of the Tule River in 2014 (Corps, Biological Assessment 2019). In addition, burrowing owls were observed on the east side of the reservoir in March 2017 (Corps, Environmental Assessment 2020).

During the 2019 United States Army Corps of Engineers (Corps) and USFWS surveys, owls, osprey and a bald eagle were detected nesting around Lake Success. Songbirds utilize the transient woodlands for nesting when they are available, due to shifting water levels. The trees used for nesting are, at minimum, one mile across the lake from the Project footprint, near the North Fork of the Tule River. There are currently evidenced burrows from ground squirrels, rabbits and fox on the right abutment slope. The construction activities would prevent new dens from being created, but upon completion of activity would return to normal transient den creation and habitation.

The main dam saddle is characterized by a flat river valley, flanked on the east by a moderately steep hill abutment and on the west by a low wide terrace. The rolling hills around the reservoir are dotted with oaks, sycamores, cottonwoods, and willows. The upstream limit of Lake Success, where it currently submerges the Tule River, is a variable willow and cottonwood habitat. Higher reservoir levels usually inhibits significant willow growth during normal wet years. As the reservoir level drops during the hot summer months, and especially drought years, willows generally survive the harsh summer climates if they are located in saturated reservoir bottom areas. Lake Success has recently experienced several years of drought, and as a result there has been an increase in willow establishment at lower elevations in the reservoir. Willow removal is a part of ongoing operation and maintenance practices at the reservoir in order to ensure that vegetation growth during low water levels does not impact long-term gross pool space within the reservoir. The Project footprint contains pasture/grasslands, small regions of very sparse shrubs, and five individual elderberry shrubs.

The spillway is mostly devoid of vegetation and is composed of bedrock and gravel. The land surrounding the lake that would be occasionally inundated by the raised spillway is composed mostly of grasslands with nonnative cool-season grasses, with an exception of the wildlife areas, which have a few junipers. Based on surveys in 2019 and 2020, the SCE Transmission line right of way is most composed of a monoculture of wild black mustard (*Brassica nigra*) with some occasional cockleburs (*Xanthium strumarium*) in lower areas, which are wetter. SCE's distribution facilities that will require removal, replacement, and/or relocation are located in various areas surrounding the perimeter of the lake and at the Highway 190 bridge (Refer to Figure 2-15 in Chapter Two). The Frazier Dike levee is mostly bare soil with spotty ruderal vegetation. Current routine maintenance involves periodic removal of herbaceous vegetation. The abutments of the Highway 190 bridge are currently dominated by wild radish (*Raphanus sativus*), tumbleweed (*Salsola* spp.), and protective riprap.

Regulatory Setting

Federal

Federal Endangered Species Act

The Federal Endangered Species Act (ESA) protects fish and wildlife species and their habitats that have been identified by the National Marine Fisheries Service (NMFS) or U.S. Fish and Wildlife Service (USFWS) as threatened or endangered. Endangered refers to species, subspecies, or distinct population segments (DPSs) that are in danger of extinction through all or a significant portion of their range. Threatened refers to species, subspecies, or DPSs that are likely to become endangered in the near future.

ESA is administered by USFWS and NMFS. In general, NMFS is responsible for protection of listed marine species and anadromous fish, and USFWS is responsible for other listed species. Implementation of any project that may result in take of any species protected by ESA would be subject to approval and oversight by NMFS and USFWS, as relevant, and subject to the terms and conditions of any biological opinion (BO) from that agency. Compliance with the terms and conditions of the BOs would further ensure that no implemented project would jeopardize the continued existence of any threatened or endangered species. Relevant ESA provisions are summarized below.

Section 9

ESA Prohibitions: ESA Section 9 prohibits the take of any fish or wildlife species listed under ESA as endangered. Take of threatened species also is prohibited under Section 9, unless otherwise authorized by federal regulations. Take, as defined by ESA, means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Harm is defined as "any act that kills or injures the species, including significant habitat modification." In addition, Section 9 prohibits removing, digging up, cutting, and maliciously damaging or destroying federally listed plants on sites under federal jurisdiction.

Section 7

ESA Authorization Process for Federal Actions: ESA Section 7 provides a means for authorizing take of threatened and endangered species by federal agencies. Under Section 7, a federal agency that permits, licenses, funds, or otherwise authorizes a project activity must consult with the USFWS to ensure that its actions would not jeopardize the continued existence of any listed species or destroy or adversely modify designated Critical Habitat.

Federal Migratory Bird Treaty Act of 1918

The Migratory Bird Treaty Act (16 U.S.C. 704) makes it unlawful to "take" (kill, harm, harass, etc.) any migratory bird listed in 50 Code of Federal Regulations 10, including their nests, eggs, or products. Migratory birds include geese, ducks, shorebirds, raptors, songbirds, and many other species.

Federal Clean Water Act Section 404

Section 404 of the Federal Clean Water Act (CWA) regulates the discharge of dredged material, placement of fill material, or excavation within waters of the United States and authorizes the Secretary of the U.S. Army, through the Chief of Engineers, to issue permits for such actions. "Waters of the United States" are defined by the Council on Environmental Quality (CEQ) as "rivers, creeks, streams, and lakes extending to their headwaters and any associated wetlands." Wetlands are defined by the CEQ as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions." The permit review process entails an assessment of potential adverse effects on Corps jurisdictional waters of the United States and wetlands. Within the Planning Area, the Kings River and Collins Creek are known Waters of the U.S.

Federal Clean Water Act Section 401

The mission of the California Regional Water Quality Control Board (RWQCB) is to develop and enforce water quality objectives and implement plans that will best protect the beneficial uses of the State's waters, recognizing local differences in climate, topography, geology, and hydrology. Section 401 of the CWA requires that:

> "any applicant for a Federal permit for activities that involve a discharge to waters of the State, shall provide the Federal permitting agency a certification from the State in which the discharge is proposed that states that the discharge will comply with the applicable provisions under the Federal Clean Water Act."

Before the Corps will issue a Section 404 permit, the Project Applicant must apply for and receive a Section 401 water quality certification from the RWQCB. A complete application for 401 Certification will include a detailed Water Quality Management Plan (WQMP) that addresses the key water quality features of the Project to ensure the integrity of water quality in the area during and after construction.

Under separate authorities granted by state law (i.e., the Porter-Cologne Water Quality Control Act), a RWQCB may choose to regulate discharges of dredge or fill materials by issuing or waiving (with or without conditions) Waste Discharge Requirements (WDRs), a type of state discharge permit, instead of taking a water quality certification action. Processing of a WDR is similar to that of a Section 401 certification; however, the RWQCB has slightly more discretion to add conditions to a project under the Porter-Cologne Water Quality Control Act than under the federal CWA.

Executive Order 11990

On May 24, 1977, President Carter signed Executive Order (E.O.) 11990, requiring federal agencies to avoid adverse impacts (both long- and short-term) to wetlands whenever there is a practicable alternative available. The order defines wetlands as areas that are inundated by surface or ground water with a frequency to support a prevalence of vegetative or aquatic life that require saturation or seasonally saturated soil conditions for growth and reproduction.

State

California Fish and Game Code

The California Fish and Game Code (CFGC) includes mandates for persons in the State of California who tamper with, affect, or alter environmental resources. The following sections illustrate the sections of the CFGC that pertain to the proposed Project.

California Endangered Species Act

The California Endangered Species Act (CESA) generally parallels the main provisions of the FESA and is administered by the CDFW. Its intent is to prohibit take and protect state-listed endangered and threatened species of fish, wildlife, and plants. Unlike its federal counterpart, CESA also applies the take prohibitions to species petitioned for listing (state candidates). Candidate species may be afforded temporary protection as though they were already listed as threatened or endangered at the discretion of the Fish and Game Commission. Unlike the FESA, CESA does not include listing provisions for invertebrate species. Under certain conditions, CESA has provisions for take through a 2081 permit or Memorandum of Understanding. In addition, some sensitive mammals and birds are protected by the State as Fully Protected Species. California Species of Special Concern are species designated as vulnerable to extinction due to declining population levels, limited ranges, and/or continuing threats. This list is primarily a working document for the CDFW's California Natural Diversity Data Base (CNDDB) project which maintains a database of known and recorded occurrences of sensitive species. Informally listed taxa are not protected per se, but warrant consideration in the preparation of biological resources assessments.

Fully Protected Species (CFGC § 3511, 4700, 5050, and 5515)

CFGC Sections 3511, 4700, 5050, and 5515 list the bird, mammal, reptile, amphibian, and fish species that are identified as "fully protected." Fully protected wildlife may not be harmed, taken, or possessed. The classification of "fully protected" was California's initial effort to identify and provide additional protection to those wildlife species that were rare or faced possible extinction. Lists were created for fish, amphibians and reptiles, birds, and mammals. Most of the fully protected species have also been listed as threatened or endangered species under the more recent endangered species laws and regulations.

Migratory Birds (CFGC § 3500-3516, and 3800)

CFGC Section 3513 furthers the intent of the MBTA by prohibiting any take or possession of birds in California that are designated by the MBTA as migratory non-game birds, except as allowed by

federal rules and regulations promulgated pursuant to the MBTA. In addition, CFGC Sections 3503, 3503.5, 3511, and 3800 further protect nesting birds and their parts, including passerine birds, raptors, and state "fully protected" birds. These regulations protect almost all native nesting birds, not just special-status birds.

State of California—Section 1602 of the California Fish and Game Code

Streambeds and other drainages that occur within the Planning Area are subject to regulation by the CDFW. The CDFW considers most drainages to be "streambeds" unless it can be demonstrated otherwise. A stream is defined as a body of water that flows at least periodically or intermittently through a bed or channel with banks and supports fish or other aquatic life. This includes watercourses having a surface or sub-surface flow that supports, or has supported, riparian vegetation. CDFW jurisdiction typically extends to the edge of the riparian canopy, and therefore, usually encompasses a larger area than Corps jurisdiction.

Section 1602 of the California Fish and Game Code requires any entity (e.g., person, state or local government agency, or public utility) which proposes a project that will substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake, or deposit or dispose of debris, waster, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake, to first notify CDFW of the project. The CDFW will review the project as it affects streambed habitats within the project area. The CDFW may then place conditions on the Section 1602 clearance to avoid, minimize, and mitigate the potentially significant adverse effects within CDFW jurisdictional limits.

State and Regional Water Quality Control Board

The State Water Resources Control Board (SWRCB) has jurisdiction throughout California and protects water quality by setting statewide policy and coordinating the nine RWQCBs in California that exercise regulatory activities by basins. Typically, the areas subject to RWQCB jurisdiction coincide with those of the Corps (i.e., waters of the U.S., including any wetlands), and the RWQCB is therefore responsible for the administration of Section 401 of the federal CWA. The RWQCB also asserts authority over waters of the state under waste discharge requirements pursuant to the Porter-Cologne Water Quality Control Act (Porter-Cologne). Waters found to be isolated and not subject to CWA regulation are often still regulated by the RWQCB under Porter-Cologne. If a CWA Section 404 permit is not required for an action, the RWQCB may still require a permit (i.e., Waste Discharge Requirement) under Porter-Cologne.

State of California – Porter Cologne Act

The SWRCB has ruled after the U.S. Supreme Court decisions to reduce the federal jurisdiction over Waters of the U.S., that the State would require that a Waste Discharge Report be required for any discharge of waste, including fill, into "waters of the state", other than those projects requiring a federal Section 404 permit and the State's Section 401 Certification of the federal permit, under the authority of the Porter Cologne Act. This essentially extends the State's assumption of the National Pollutant Discharge Elimination System (NPDES) program, by modifying the definition of waste. The RWQCB is responsible for issuing Waste Discharge Permits.

State of California—Sections 3503, 3503.5, and 3800 of the California Fish and Game Code

These sections of the Fish and Game Code prohibit the "take or possession of birds, their nests, or eggs." Disturbance that causes nest abandonment and/or loss of reproductive effort (killing or abandonment of eggs or young) is considered a "take." Such a take would also violate Federal law protecting migratory birds.

Incidental Take Permits (i.e., Management Agreements) are required from the CDFW for projects that may result in the incidental take of species listed by the State of California as endangered, threatened, or candidate species. The permits require that impacts to protected species be minimized to the extent possible and mitigated to a level of insignificance.

State of California—2800 et seq. of the California Fish and Game Code- Natural Community Conservation Planning Act

This section of the Fish and Game Code outlines the methodology taken to establish Natural Community Conservation Plans (NCCP); however, there are no NCCP's in effect for the Planning Area.

California Native Plant Society

The California Native Plant Society (CNPS) is a private plant conservation organization dedicated to the monitoring and protection of sensitive species in California. CNPS has compiled an inventory comprising information focusing on geographic distribution and qualitative characterization of Rare, Threatened, or Endangered vascular plant species of California. Sensitive species that occur or potentially could occur within the Project Area are based on one or more of the following: (1) the direct observation of the species during one of the biological surveys; (2) a record reported in the CNDDB; and (3) the Project Area is within known distribution of a species and contains appropriate habitat.

Local

Tulare County Ordinance 2-05-1230: Land, Vegetation, and Structures

Tulare County Code, Part 2, Section 5, Section 1230 states:

> It shall be unlawful for any person to remove, injure, destroy, pick, dig, break, uproot, dislodge, or carry away any plant, tree, flower, shrub, bush, or any branch, limb, bud, shoot or leaf thereof, or any wood, earth, leaf mold, rock or stone, or any building, bench, fence, wall, railing, seat, sign, marker, or other structure or to destroy, injure, or deface any natural formation, historical feature, or archeological feature in a County Park or Recreation Area, except with the permission of the General Services Director; provided, however, that the provisions of this section shall not be applicable to conduct which is made a misdemeanor under section 602 of the Penal Code of the State of California.

Tulare County General Plan 2012

The Tulare County General Plan of 2012 lists the following Environmental Resources Management (ERM) measures:

ERM-1: To preserve and protect sensitive significant habitats, enhance biodiversity, and promote healthy ecosystems throughout the County

- ERM-1.1 Protection of Rare and Endangered Species

  The County shall ensure the protection of enviro life and plant life, including those species designated as rare, threatened, and/or endangered by state and/or federal government, through compatible land use development.

- ERM-1.2 Development in Environmentally Sensitive Areas

  The County shall limit or modify proposed development within areas that contain sensitive habitat for special-status species and direct development into less significant habitat areas. Development in natural habitats shall be controlled so as to minimize erosion and maximize beneficial vegetative growth.

- ERM-1.3 Encourage Cluster Development

  When reviewing development proposals, the County shall encourage cluster development in areas with moderate to high potential for sensitive habitat.

- ERM-1.4 Protect Riparian Areas

  The County shall protect riparian areas through habitat preservation, designation as open space or recreational land uses, bank stabilization, and development controls.

- ERM-1.5 Riparian Management Plans and Mining Reclamation Plans

  The County shall require mining reclamation plans and other management plans to include measures that protect, maintain, and restore riparian resources and habitats.

- ERM-1.6 Management of Wetlands

  The County shall support the preservation and management of wetland and riparian plant communities for passive recreation, groundwater recharge, and wildlife habitats.

- ERM-1.7 Planting of Native Vegetation

  The County shall encourage the planting of native trees, shrubs, and grasslands in order to preserve the visual integrity of the landscape, provide habitat conditions suitable for native vegetation and wildlife, and ensure that a maximum number and variety of well-adapted plants are maintained.

- ERM-1.8 Open Space Buffers

  The County shall require buffer areas between development projects and significant watercourses, riparian vegetation, wetlands, and other sensitive habitats and natural communities. These buffers should be sufficient to assure the continued existence of the waterways and riparian habitat in their natural state.

- ERM-1.9 Coordination of Management on Adjacent Lands

  The County shall work with other government land management agencies (such as the Bureau of Land Management, U.S. Forest Service, National Park Service) to preserve and protect biological resources, including those within and adjacent to designated critical habitat, reserves, preserves, and other protected lands, while maintaining the ability to use and enjoy the natural resources in the County.

- ERM-1.10 Appropriate Access for Recreation

  The County shall encourage appropriate access to resource-managed lands.

- ERM-1.14 Mitigation and Conservation Banking Program

  The County shall support the establishment and administration of a mitigation banking program, including working cooperatively with Tulare County Association of Governments (TCAG), federal, state, not-for-profit, and other agencies and groups to evaluate and identify appropriate lands for protection and recovery of threatened and endangered species impacted during the land development process.

- ERM-1.15 Minimize Lighting Impacts

  The County shall ensure that lighting associated with new development or facilities (including street lighting, recreational facilities, and parking) shall be designed to prevent artificial lighting from illuminating adjacent natural areas at a level greater than 1 foot candle above ambient conditions.

- ERM-1.16 Cooperate with Wildlife Agencies

  The County shall cooperate with state and federal wildlife agencies to address linkages between habitat areas.

- ERM-1.17 Conservation Plan Coordination

  The County shall coordinate with local, state, and federal habitat conservation planning efforts (including Section 10 Habitat Conservation Plan) to protect critical habitat areas that support endangered species and other special-status species.

Porterville Area Community Plan

Guiding Policy Open Space and Conservation (OSC)-G-7: Protect habitat for special-status species, designated under state and federal law.

- OSC-I-26

  Adopt habitat conservation regulations, including requirements and incentives to incorporate natural wildlife habitat features into new development and public landscapes, parks, and other public facilities.

- OSC-I-27

  Protect and enhance the natural habitat features of the Tule River and open space corridors within the Planning Area.

- OSC-I-28

  Require protection of sensitive habitat areas and special-status species in new development site designs in the following order: (1) avoidance, (2) onsite mitigation, (3) offsite mitigation, and (4) purchase of mitigation credits.

- OSC-I-29

  Require assessments of biological resources prior to approval of any development within 300 feet of any creeks, sensitive habitat areas, or areas of potential sensitive status species.

- OSC-I-30

Adopt regulations to promote water-conserving landscape plans, including the use of drought tolerant plants.

- OSC-I-31

  Require, as part of the proposed Tule River Corridor Plan, measures to protect and enhance riparian zones, natural areas, and wildlife habitat qualities; and establish and maintain a buffer along the river where development shall not occur, except as part of the parkway enhancement (e.g., trails and bikeways).

  For park improvements and commercial recreation (campground) proposals, the plan will require a buffer zone along the river in which no grading or construction activities will occur, except as needed for shoreline uses.

- OSC-I-32

  Identify and protect wildlife movement corridors that serve critical habitats to minimize wildlife-urban conflicts.

- OSC-I-33

  Protect, revitalize, and expand Porterville's urban forest through public education, sensitive regulation, and a long-term financial commitment that is adequate to protect this resource.

- OSC-I-34

  Continue to require street tree planting in new development and consider support the City's tree planting fund.

- OSC-I-35

  Consult with all responsible agencies about wetland and vernal pool habitat potentially affected by development.

- OSC-I-36

  Establish a "no net loss" policy for wetlands and vernal pools, including credits for land banking and offsite mitigation, and maintain a protection zone around wetlands, riparian corridors, and identified habit areas where development shall not occur, except as part of a parkway enhancement program (e.g., trails and bikeways).

Thresholds of Significance

The thresholds of significance for this section are established by the CEQA Checklist Item. In accordance with Appendix G of the CEQA Guidelines, the proposed Project would have a significant environmental impact if it would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service;
- Have a substantial adverse effect on state or federally-protected wetlands (including, but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery site;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance;
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Impacts and Mitigation Measures

The information and analysis presented in this section are based on the Corps Biological Assessment prepared for the Project and SCE's biological surveys. The Biological Assessment is provided in Appendix B.

The SCE project-specific impacts are evaluated and, in some cases, mitigation measures that are specific to SCE's activities are identified.

Impact 3.4-1: *Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service?*

Less than Significant Impact with Mitigation Incorporation. The Corps requested a list of federally listed, candidate species, and species of concern that may be affected by the Project via the USFWS Information for Planning and Consultation (IPaC) website (USFWS 2019). Additionally, the Corps searched the California Natural Diversity Database (CNDDB) in 2019

and 2020 for occurrences of federal and state listed species near the Project area within the 'Success Dam' U.S. Geological Survey. The following protected species are potentially impacted by Project activities at Lake Success and were considered in the updated December 2019 Biological Assessment:

- Southwestern Willow Flycatcher (*Empidonax traillii*) Endangered
- San Joaquin Kit Fox (*Vulpes macrotis mutica*) Endangered
- San Joaquin Adobe Sunburst (*Pseudobahia peirsonii*) Threatened
- Least Bell's Vireo (*Vireo bellii pusillus*) Endangered

In addition, the following special-status species were considered but not evaluated fully due to their lack of occurrence in Project disturbance areas during the biological surveys:

- California Condor (*Gymnogyps californianus*) Endangered
- Blunt-nosed Leopard Lizard (*Gambelia silus*) Endangered
- Giant Garter Snake (*Thamnophis gigas*) Threatened
- California Red-legged frog (*Rana draytonii*) Threatened
- Valley Elderberry Longhorn Beetle (VELB) (*Desmocerus californicus dimorphus*) Threatened
- Delta Smelt (*Hypomesus transpacificus*) Threatened
- Keck's Checker-mallow (*Sidalcea keckii*) Threatened
- Springville Clarkia (*Clarkia springvillensis*) Threatened

The only species listed above with designated critical habitat in the Lake Success area is the California condor. The California condor's critical habitat covers the northern mile of Lake Success with its southern-most edge. Most of the Project area is one mile south of the southern extent of the condor's critical habitat. Placement of armoring along Frazier Dike would occur within the designated critical habitat. However, there is no appropriate nesting habitat for the condor and the USFWS has only documented transient condor visits to the Project area (USFWS 2015, unpublished GPS telemetry data). As a result, the Corps has determined that the proposed action would have no effect on the condor. Keck's checker-mallow and striped adobe lily (*Fritillaria striata*, a state listed species) populations are near the reservoir, but both are outside of

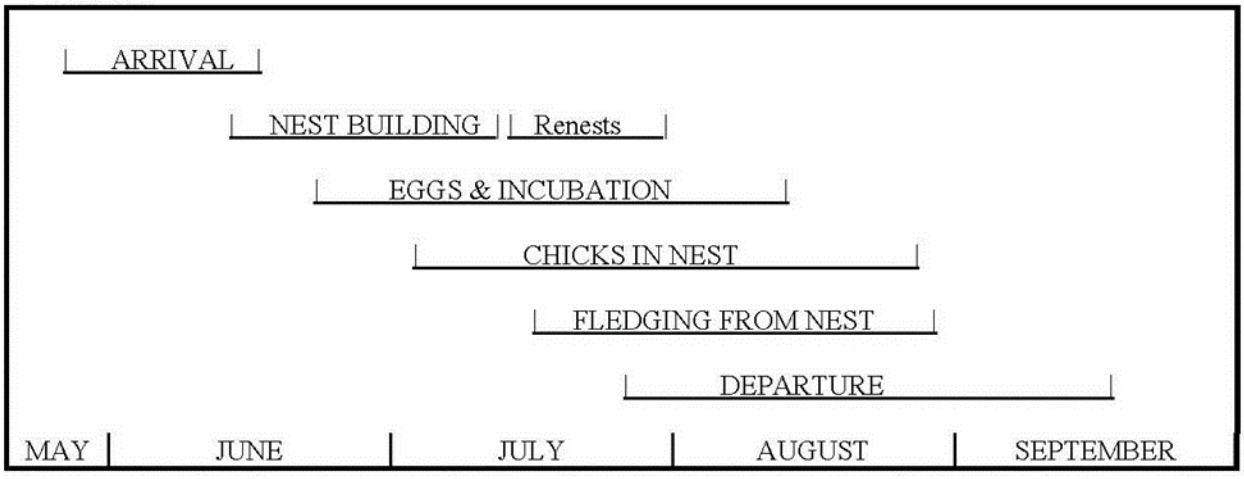
the inundation area and not within the Project area. These species would not be affected by the Project and therefore are not further discussed.

The Corps coordinated with the USFWS on the federally endangered least Bell's vireo due to updated information indicating the potential presence of the vireo in the Lake Success area. As a result, this section has been revised to include discussion of the vireo. A discussion of each species and the potential for their occurrence in the Project area is provided below.

Southwestern Willow Flycatcher. Southwestern willow flycatchers (*Empidonax traillii*) are neotropical migrants that breed in patches of riparian habitat throughout the American southwest. Their breeding habitat currently ranges from southern California, through southern Nevada, southern Utah, Arizona, New Mexico, southwestern Colorado, and historically included western Texas and extreme northwestern Mexico. They travel south to winter ranges in Mexico, Central America, and northern South America. While their current distribution is similar to their historic range, southwestern willow flycatcher population numbers have declined precipitously in response to the loss of suitable riparian habitat throughout the region.

The final critical habitat designation includes 1,227 floodplain miles in California, Arizona, Nevada, Utah, Colorado, and New Mexico encompassing a total area of approximately 208,973 acres within the 1 percent AEP-plain or flood-prone areas. Lake Success is outside the designated critical habitat area. Where the Tule River flows into Lake Success there are about 160 acres of transient willow riparian woodland that is adequate southwestern willow flycatcher nesting habitat. From a Google Earth review of the Project area, the habitat appears to be mixed willow and blue oak woodland. Figure 3.4-1 displays the general nesting timeline for the Lake Success area.

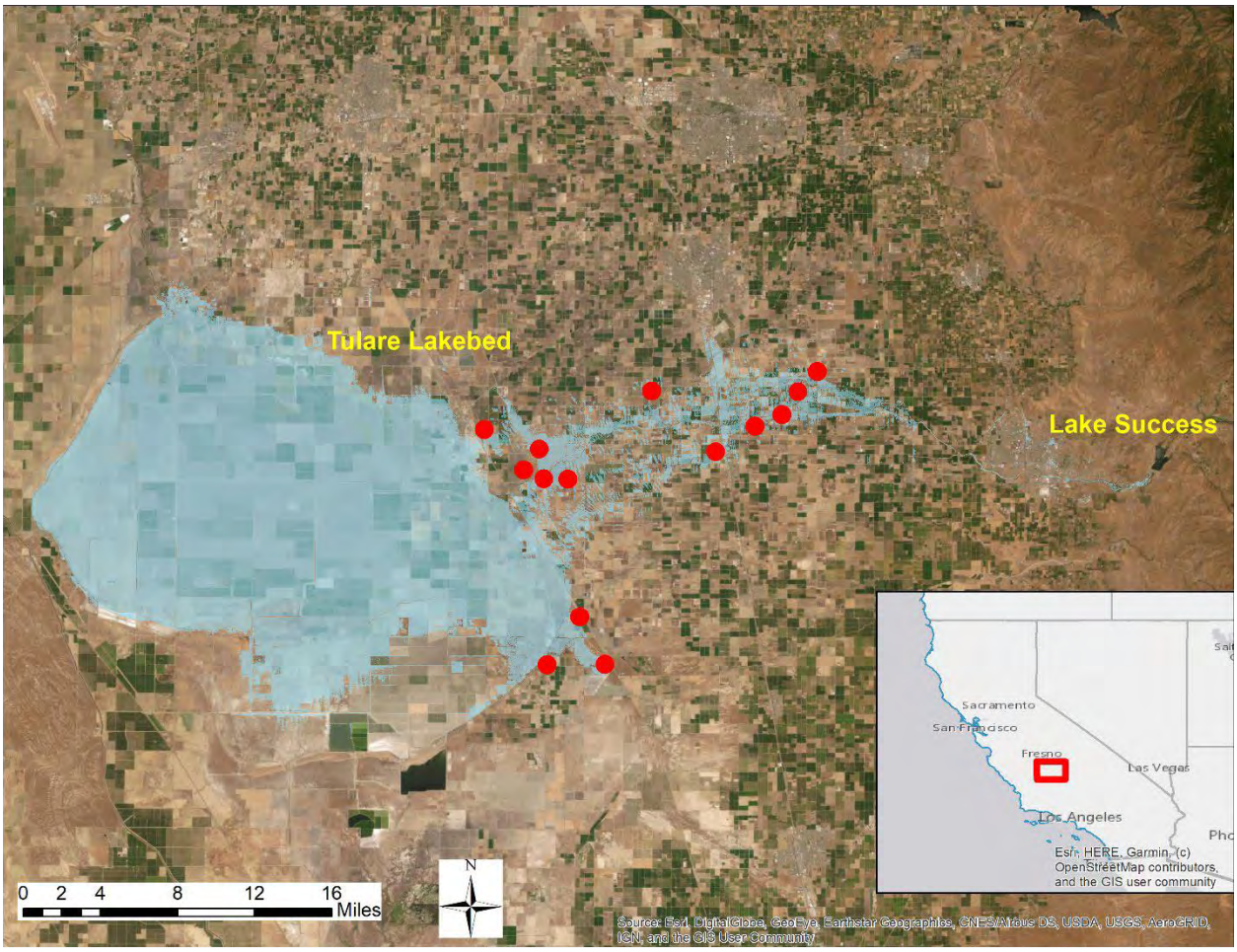
Figure 3.4-1: General Willow Flycatcher Breeding Chronology for Central and Northern California.



San Joaquin Kit Fox. Historically, the San Joaquin kit fox (*Vulpes macrotis mutica)* occurred in several San Joaquin Valley native plant communities. In the southernmost portion of the range, these communities included valley sink scrub, valley saltbush scrub, upper Sonoran subshrub scrub, and annual grassland. San Joaquin kit foxes also exhibit a capacity to utilize habitats that have been altered by humans. Kit foxes can inhabit the margins and fallow lands near irrigated row crops, orchards, and vineyards, and may forage occasionally in these agricultural areas (USFWS 1998a).

The kit fox typically inhabits open grasslands, which form large contiguous blocks within the eastern portions of its range. The listed canine also utilizes oak savanna and some types of agriculture (e.g., orchards and alfalfa). Orchards occur in large contiguous blocks in the northwest portions of the Project area and at scattered locations in the southwest portions. Orchards sometimes support prey species if the grounds are not manicured; however, denning potential is typically low and kit foxes can be more susceptible to coyotes predation within the orchards (Bell 1994; Scott-Graham 1994). Although agricultural areas are not traditional kit fox habitat and are often highly fragmented, they can offer sufficient prey resources to support small numbers of kit foxes, but usually lack denning sites. Low quality, suitable habitat is present, but the Project area is at the edge of the species current known range (Figure 3.4-2). The kit fox has been documented in the eight surrounding quads but greater than 5 miles from the Project area (CDFW 2019). USFWS has advised that the kit fox may potentially use the area for foraging or as a movement corridor.

Figure 3.4-2: Occurrence of kit fox within and adjacent to the lower Tule River floodplain and Tulare Lakebed. All occurrences within the lower Tule River floodplain are from the early 1970s, one occurrence (third from the bottom of the map) is from 2002.



Least Bell's Vireo. The least Bell's vireo (*Vireo bellii pusillus*) is a riparian species of bird that typically inhabits structurally diverse woodlands such as cottonwood bottomland forest, sycamore alluvial woodland, arroyo willow riparian forest, and mulefat scrub. Habitat requirements generally feature variable height structures including dense cover within 6 feet of the ground for nesting and a dense stratified canopy for foraging. This type of structure is most often associated with early successional riparian habitat, but the age of the vegetation is less important than the structure diversity. Least Bell's vireos are insectivorous and will often forage insects directly from vegetation (USFWS 1998b).

Least Bell's vireo have been observed arriving in southern California in mid-March to early April, with nest building activities occurring a few days after pair formation. Nests are typically

constructed in the fork of a tree or shrub within three feet of the ground. Egg laying begins shortly after nest completion, with incubation lasting approximately 14 days. An additional 10 to 12 days are required for fledging, though adults continue to care for the young at least two weeks after fledging. Re-nesting is common, though there have been few documented instances of re-nesting past July (USFWS 1998b).

In the Lake Success area, there were reports of the vireo's presence in the Tule River riparian zone on the north east side of the reservoir in 2014. All documented nests were within the reservoir's existing gross pool zone (Corps 2014).

San Joaquin Adobe Sunburst. The San Joaquin adobe sunburst (*Pseudobahia peirsonii*) is a member of the sunflower family (*Asteraceae*) and has woolly gray stems and foliage. Each plant produces a single head of yellow disk and ray flowers at the ends of the branches between March and May. San Joaquin adobe sunburst is restricted to heavy, adobe clay soils with slight slopes on valley floors and rolling hills in scattered location in northern Kern County, Tulare, and Fresno counties. These soils may be favored by the San Joaquin adobe sunburst for their moisture holding capacity in the summer dry season. This plant is endemic to the eastern San Joaquin Valley. The population is limited to about 31 occurrences in valleys and flats and in the foothills of the Sierra Nevada (USFWS 1992). It occurs at elevations ranging from 500 to 2,500 feet above mean sea level primarily in annual grassland plant communities, but sometimes in annual grassland-blue oak woodland ecotone communities. San Joaquin adobe sunburst grows in grasslands dominated by non-native annual grasses, mustards, and filarees. The intrusive and aggressive nature of these herbaceous weeds appears to be detrimental to the quality of habitat for the San Joaquin adobe sunburst.

The extant population at Lake Success is considered in fair condition and a remnant population of a larger one that used to occupy an area that is now part of Lake Success. The Lake Success extant population of San Joaquin adobe sunburst has varied from 50 to over 300 individual plants in four different areas covering an estimated 10-acre area along the west side of Lake Success and Boat Island. In addition, there is a small population on the south side of the inlet where the South Fork of the Tule River enters Lake Success (USFWS 1991; Corps 2009).

San Joaquin adobe sunburst successfully blooms during locally high rain years at Lake Success. The local populations of the plant are not dependent on the lake's flow regime or the pool elevation. Based on recent intensive surveys conducted by the Corps in 2019 and 2020 during the flowering season, the single population within the Phase 1 construction footprint no longer exists, possibly due to grazing by cows and horses on private land and by goats and/or sheep on Corps lands. During the 2019 surveys, the Corps discovered two new populations of San Joaquin adobe

sunburst. Both are outside the Phase 1 and 2 construction limits and they are above the lake's new proposed gross pool elevation. There is one population near the main stockpile area. This population was first mapped in 2006 by Corps contracted botanists. Corps surveys in 2020 revealed that this population had expanded over a larger area since 2006.

Determination

Due to the stochastic nature of future water level fluctuations, and therefore suitable habitat, and the short duration of this Project, the effect on southwestern willow flycatcher and least bell's vireo is expected to be less than significant. The Project actions may result in short-term avoidance by kit fox due to construction. However, these actions would take place late fall and winter, reducing the likelihood of encountering a kit fox. Long-term intermittent impacts from periodic inundation of potential kit fox habitat would occur when the lake rises above the existing gross pool elevation. A 25-foot buffer would be created around the San Joaquin adobe sunburst population near the main stockpile using exclusionary fencing to protect the plants. BMPs and compensatory mitigation (see Mitigation Measure BIO-1) would avoid, minimize, or reduce impacts to the above described listed species to less than significant.

SCE Project Components

Due to Corps Engineering Regulation (ER) 1110-2-4401, the SCE transmission line which crosses over the western edge of Lake Success would have to be raised to a minimum height of 52 feet to accommodate sailboats. SCE would replace 15 lattice steel transmission towers with 14 new, higher H-frame hybrid transmission structures (See Figure 2-14 in Chapter Two – Project Description). Figure 2-14 shows SCE Transmission lines (black) with 15 transmission towers (purple) that would be replaced with 14 higher-clearance transmission towers (red). This work would occur after the ogee weir construction is complete, when lake levels are low to avoid in-water work. In addition, up to 40 distribution power poles on three miles of the existing 12-kV facilities all around the Lake Success area, including the area along the Highway 190 bridge would be removed, replaced or relocated (Figure 2-15 in Chapter Two – Project Description).

SCE Project Construction

Less Than Significant With Mitigation Incorporation. Construction of SCE's Proposed Project could potentially result in adverse impacts to listed plants and non-listed special-status plant species occurring or with potential to occur in the disturbance areas. The listed special-status plant species, Springville clarkia, occurs within SCE's Proposed Project Study Area. Non-listed

special-status plant species, including shining navarretia and small flowered morning glory, also occur within SCE's Proposed Project Study Area. Although not detected during surveys, one additional listed species, the San Joaquin adobe sunburst, is likely to occur in suitable habitats within SCE's Proposed Project Study Area.

The Blue Ridge Condor Area is a unit of USFWS-designated critical habitat for the California condor that overlaps the northern portion of the SCE Project Study Area. The unit is considered a condor roosting area between the months of April and September, and the species is considered extant within the unit (CDFW, 2017). Although the California condor is considered present within the Blue Ridge Condor Area and may, on rare occasions, soar over the SCE Project Study Area, condors are not known to regularly use any particular site within the SCE Project Study Area, and suitable nesting habitat is not present within SCE's Proposed Project footprint. Individual condors were observed roosting in the Blue Ridge National Wildlife Refuge in June 2017 (USFWS, 2017); however, condors are primarily occurring much farther east, within more hilly/mountainous terrain and not within the SCE Project Study Area and are not likely to be impacted by construction.

Construction of SCE's Proposed Project could potentially result in significant impacts to federally and/or state listed or fully protected wildlife species and/or non-listed special-status wildlife species. These include burrowing owl, northern harrier, loggerhead shrike, pallid bat, Townsend's big-eared bat, western mastiff bat, and American badger. Suitable habitat for burrowing owl is present within the SCE Project Study Area; however, no burrowing owls or their sign have been observed during surveys conducted in the SCE Project Study Area. Northern harriers have been observed in the Study Area during winter months, and suitable nesting habitat is present. A limited amount of suitable nesting habitat for loggerhead shrike exists in the Study Area. Two individual loggerhead shrikes were observed during the May 2018 reconnaissance surveys and appeared to be nesting adjacent to the Springville Substation.

SCE's Proposed Project has the potential to impact foraging habitat for bats, including pallid bat, Townsend's big-eared bat, and western mastiff bat, present within the Study Area. Potential night roost habitat for pallid bats is present in trees; however, proposed construction activities will be generally limited to daylight hours, with some exceptions. There may be some construction activities such as mobilization to work sites during pre-dawn hours and construction crews demobilizing a work site in the late evening hours. In addition, there may be some night work at the substations, temporary shoo-fly poles, new transmission poles and/or at distribution poles associated with energizing the lines. The energization work is conducted pole-top and there is no ground disturbance work. Therefore, night roosting pallid bats will not be significantly impacted

by SCE Project construction. Any western mastiff bats using buildings as night roosts will also not be impacted by SCE Project construction based on nighttime restrictions. Both the pallid bat and western mastiff bat may use buildings as day roosts. Pallid bats may occasionally use hollow trees as day roosts, and western mastiff bats may also use rock crevices as day roosts. However, none of these habitats are expected to be impacted by proposed construction activities.

SCE's Proposed Project has the potential to impact denning, reproduction, and foraging habitat for American badger. Although no burrows suitable for use by American badger were observed during the November 2017 or May 2018 reconnaissance surveys, the open, expansive habitat in the Study Area is suitable for this species, and individuals could disperse into the Study Area prior to or during construction.

Corps surveys in 2014 detected least Bell's vireo at Lake Success. At least two Bell's vireo territories/breeding pairs were observed and recorded within the Tule River riparian area (Stewart 2014). Prior dry years had allowed dense riparian and woodland vegetation to regenerate and become established in areas well below the gross pool elevation where it would normally be inundated. However, SCE's Proposed Project is not anticipated to have a significant impact on this species, as the nearest SCE distribution facility proposed for replacement is approximately 2,000 from the location of where least Bell's vireo were observed. To ensure impacts to least Bell's vireo remain less than significant, SCE will implement mitigation measure SCE BIO – 9 (Avoid and Minimize Impacts to Least Bell's Vireo and Southwestern Willow Flycatcher).

SCE's Proposed Project construction would implement the following Mitigation Measures (See Mitigation Measures herein) which would reduce direct and indirect impacts to less than significant:

- SCE BIO-1 Preconstruction Surveys and Biological Monitoring
- SCE BIO-2 Integrated Weed Management Plan
- SCE BIO-3 Habitat Restoration Management Plan
- SCE BIO-4 General Avoidance and Minimization of Impacts to Aquatic or Wetland Habitat
- SCE BIO-6 Special-status Plants
- SCE BIO-7 Burrowing Owl Surveys
- SCE BIO-8 Nesting Bird Management Plan
- SCE BIO-9 Avoid and Minimize Impacts to Least Bell's Vireo and Southwestern Willow Flycatcher

Furthermore, per CFGC 1913(b), public utility operations are not restricted by the presence of special-status plants. Therefore, the proposed Project construction would not have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status in local or regional plans, policies, or regulations, or by the CDFW or USFWS.

SCE Project Operation

Less than Significant Impact. Operation of SCE's Proposed Project has the potential to increase the electrocution and collision risk for avian species, particularly large raptors. Electrocution can occur when the bird's body is in contact with two different phases at the same time (e.g., connecting phase to ground or connecting phase to phase). Collision risk may occur when the bird's body comes into contact with a static wire. These impacts would be considered potentially significant. However, all transmission and distribution line structures would be designed consistent with *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (Avian Power Line Interaction Committee, 2006) and *Reducing Avian Collisions with Power Lines: The State of the Art in 2012* (Avian Power Line Interaction Committee, 2012). Furthermore, per CFGC 1913(b), public utility operations are not restricted by the presence of special-status plants. Therefore, SCE's operational impact is considered less than significant.

Impact 3.4-2: *Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service?*

Less than Significant with Mitigation Incorporation. Expanding the capacity of the spillway would occasionally inundate approximately 421 acres of grassland, 44 acres of riparian woodland, and 97.6 acres of *Atriplex* scrub habitat during periods of high water. The 1999 FEIS/FEIR described 10 oak (*Quercus* spp.) trees as potentially being inundated from higher water levels after the proposed spillway raise. There would be a 12.5% chance each year that lake levels would rise above the existing gross pool elevation and less than 1% chance each year that lake levels would reach the new proposed gross pool elevation.

It is difficult to quantify the impacts to the 44 acres of riparian woodland since riparian areas already experience periodic inundation. The downstream side of the riparian woodland would be covered by up to 10 feet of lake water at infrequent times, roughly once every eight years, for

up 25 to 60 days. The upstream side of the riparian woodland would be covered by less than one inch of water infrequently for up to three to five days. The areas in between would be flooded at depths between these two extremes based on the local topography. Mature cottonwood (*Populus fremontii*), sycamore (Platanus racemosa), and willow (Salix spp.) trees can tolerate flooding up to and beyond 60 days without high levels of mortality (Walters et al. 1980). Immature cottonwood saplings are not as flood tolerant and can have as much as 50% mortality after two weeks of flooding (Auchincloss et al. 2012). Thus, cottonwood saplings could suffer periodic mortality on an infrequent basis, which could alter the current composition of the riparian woodland. Appropriate mitigation would be determined by the USFWS under the Fish and Wildlife Coordination Action. The 1999 FEIS/FEIR called for the Corps to mitigate impacts to the riparian woodlands by planting riparian trees along 83 acres of the Tule River and South Fork of the Tule River. See Mitigation Measure BIO-2.

Downstream Impacts

The 1999 FEIS/FEIR evaluated the Project impacts to land in the Tulare lakebed. According to updated Corps hydrology and hydraulics modeling, as well as the Biological Assessment prepared for the current Project, the downstream area would not be significantly affected, no impacts to downstream habitat or wetlands would occur, and the average change in water level during major floods across the Tulare Lakebed would be a reduction of only 0.001 inches. Dam operations would continue as normal. There would not be any anticipated changes to winter releases. Water volumes would continue to reach and flood fallow fields in the Tulare Lakebed that are used by waterfowl and other migratory birds. Therefore, the downstream impacts associated with the Tulare lakebed are less than significant.

SCE Project Components

Six natural communities were mapped within the transmission disturbance areas and material yards (GANDA, 2018) associated with SCE's Proposed Project. Of these communities one, black willow thickets (*Salix gooddingii*), is considered a sensitive natural community. NatureServe's Heritage Methodology is used to evaluate natural communities and develop rarity rankings. Communities are given a global (G) and a state (S) ranking. Communities with state ranking of S1-S3 are considered "sensitive." Black willow thickets have a global ranking of G4 and a state ranking of S3. Global ranking G4 means "Apparently Secure - uncommon but not rare; some cause for long-term concern due to declines or other factors" and state ranking S3 is defined as "Vulnerable - vulnerable in the state due to a restricted range, relatively few populations (often

80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation from the state."

The areas associated with the distribution component of SCE's Proposed Project were included in the plant / vegetation surveys conducted in 2018 and 2019 by the Corps. Most of the lake perimeter is comprised of non-native grasses and weedy species, and no native plant communities were identified outside of the riparian areas. The areas associated with the distribution work are dominated by non-native plant species.

SCE Project Construction

Less Than Significant With Mitigation Incorporation. SCE's Proposed Project construction would result in temporary impacts to approximately 0.16 acre of black willow thickets.

Implementation of the following SCE Proposed Measures would reduce direct and indirect impacts to less than significant:

- SCE BIO-2 Integrated Weed Management Plan
- SCE BIO-3 Habitat Restoration Management Plan
- SCE BIO-4 General Avoidance and Minimization of Impacts to Aquatic or Wetland Habitat
- SCE BIO-6 Special-status Plants

Therefore, SCE's Proposed Project construction would not have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by CDFW or USFWS.

SCE Project Operation

Less than Significant. Upon the start of SCE's Proposed Project operation, the Magundgen-Springville No. 1 and No. 2 Transmission Lines and distribution lines would operate in a similar manner as current lines. All operations and maintenance (O&M) activities would be limited to existing disturbed areas. Therefore, no significant impact would result from the operation of the Magundgen-Springville No. 1 and No. 2 Transmission Lines or the distribution lines and no additional mitigation is required.

Impact 3.4-3: *Have a substantial adverse effect on state or federally-protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?*

Less Than Significant Impact. The Corps regulates structures and work in navigable waters of the U.S. that affect the navigable capacity of such waters under Section 10 of the Rivers and Harbors Act of 1899. The Corps also regulates the discharge of dredged or fill material into all regulated waters of the U.S., including wetlands, under Section 404 of the CWA. The Corps and the EPA both have responsibilities in administering this program and typically, issue permits for these regulated activities. Although the Corps does not issue itself permits for its own Civil Works projects, Corps regulations state that The Corps must apply the guidelines and substantive requirements of Section 404 to its activities.

The Project would construct a 10 foot-high concrete ogee weir across the emergency spillway, armor the bridge on California Highway 190 that passes over the lake, add rock slope protection to Frazier Dike to accommodate the increase in gross pool, adjust or flood-protect current recreation facilities, and relocate utilities. Phase 2 would also extend and widen the Tule Recreation Area boat ramps and raise/replace 15 transmission towers and approximately two miles of transmission lines to meet minimum clearance criteria resulting from the increased gross pool. In addition, approximately 40 distribution poles will be either relocated or replaced due to the lake level rise. Some of this work would occur below the Ordinary High Water Mark (OHWM), which is equivalent to the current gross pool elevation and would fall under the CWA. Temporary land disturbance of greater than one acre would result from Project construction; therefore, the contactor would be required to prepare a NPDES storm water permit (Section 402 of the CWA). Stormwater runoff and spills of petroleum based products during construction activities have the potential to effect water quality conditions at Lake Success and downstream on the Tule River. The Corp is required to obtain a 401 Water Quality Certification and conduct a 404(b)(1) evaluation to comply with the CWA.

Construction activities would include enlarging Lake Success by raising the spillway elevation 10 feet with an ogee weir and excavating to widen the spillway from 200 feet to 365 feet. These changes would increase the capacity of the reservoir by 28,000 acre feet. In compliance with the CWA and to avoid impacts, a site specific plan with measures addressing proper disposal of silt, debris, refuse, or other pollutants associated with construction on the water side of the spillway would be implemented to prevent fill or rock material and road surface runoff from spilling into the reservoir. With implementation of BMPs required in the general construction permit and the water quality certification and measures, as applicable, effects to water quality are expected to be less than significant.

According to updated Corps hydrology and hydraulics modeling, the downstream area would not be significantly affected, no impacts to downstream habitat or wetlands would occur, and the average change in water level during major floods across the Tulare Lakebed would be a

reduction of only 0.001 inches. Dam operations would continue as normal. There would not be any anticipated changes to winter releases. Water volumes would continue to reach and flood fallow fields in the Tulare Lakebed that are used by waterfowl and other migratory birds. The impact is considered less than significant.

SCE Project Components

SCE Project Construction

Less Than Significant with Mitigation Incorporation. SCE's Proposed Project construction would temporarily impact approximately 15.82 acres of Corps, RWQCB, and CDFW jurisdictional waters. This includes approximately 3.56 acres of wetland waters consisting of lacustrine wetlands and riparian vegetation associated with Lake Success and approximately 12.27 acres of non-wetland Waters associated with Lake Success and several small, steep ephemeral drainages. SCE's Proposed Project construction would not permanently impact Corps, RWQCB, and CDFW jurisdictional waters by the placement of new tower foundations. Tower footing removal locations would be restored to the grade of the surrounding area, resulting in restoration of 0.3 acre of Corps, RWQCB, and CDFW jurisdictional waters. Implementation of the following Mitigation Measures would reduce direct and indirect impacts to less than significant:

- SCE BIO-2 Integrated Weed Management Plan
- SCE BIO-3 Habitat Restoration Management Plan
- SCE BIO-4 General Avoidance and Minimization of Impacts to Aquatic or Wetland Habitat
- SCE BIO-5 Jurisdictional Waters
- SCE BIO-6 Special-status Plants

Therefore, SCE's Proposed Project construction would not have a substantial adverse effect on federally protected wetlands, as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, and coastal) through direct removal, filling, hydrological interruption, or other means.

SCE Project Operation

Less than Significant Impact. Upon the start of SCE's Proposed Project operation, the Magundgen-Springville No. 1 and No. 2 Transmission Lines and distribution lines would operate in a similar manner as current lines. All O&M activities would be limited to existing disturbed areas. Therefore, no significant impact would result from continued operation of the Magundgen-

Springville No. 1 and No. 2 Transmission Lines or the distribution lines and no additional mitigation measures are required.

Impact 3.4-4: *Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery site?*

Less Than Significant Impact. Lake Success is known for year-round bass fishing. Lake Success also has a steady population of crappie, catfish, bluegill, and trout. Lake Success is planted several times in the fall with catchable-sized trout. There are no anadromous or estuarine species in Lake Success or Tule River because the river does not have an ocean outlet. Lake Success supports a stocked warm water fishery. Common species found in the reservoir include Florida bass *(Micropterus floridanus*), largemouth bass (*M. salmoides*), and spotted bass (*M. punctulatus*); channel catfish (*Ictalurus punctatus*); black crappie (*Pomoxis nigromaculatus*); white crappie (*Pomoxis annularis*); carp (*Cyprinis carpio*); green sunfish (*Lepomis cyanellus*); redear sunfish (*Lepomis microlophus*); bluegill (*Lepomis macrochirus*); and threadfin shad (*Dorosoma petenense*). Lake Success and the Tulare River have been chemically treated to remove all fish species in 1961, 1981, and 1987. Implementation of the proposed Project would have a less than significant impact on fisheries resources in the reservoir.

SCE Project Components

SCE Project Construction

Less than Significant Impact With Mitigation Incorporation. The Blue Ridge Condor Area is a unit of USFWS-designated critical habitat for the California condor that overlaps the northern portion of the Study Area. Although the California condor is considered present within the Blue Ridge Condor Area and may, on rare occasions, soar over the Project area, condors are not known to regularly use any particular site within the Project area and suitable nesting habitat is not present within the proposed Project footprint. Movement of any condors through the Project area is not likely to be impacted by construction.

The proposed Project may adversely affect nesting birds historically protected by the MBTA and addressed by the CFGC. Potential nests and active nests were observed during the November 2017 and May 2018 reconnaissance surveys in towers and the Springville substation, and nesting behavior was observed in birds with an unknown nest location. Nesting birds are likely to occur within Project infrastructure (e.g., towers, substation), Project equipment (e.g., cranes, travelers), and in natural areas within and adjacent to the proposed Project (e.g., burrows, shrubs, grasses).

Implementation of the following Mitigation Measures would reduce direct and indirect impacts to less than significant:

- SCE BIO-2 Integrated Weed Management Plan
- SCE BIO-3 Habitat Restoration Management Plan
- SCE BIO-4 General Avoidance and Minimization of Impacts to Aquatic or Wetland Habitat
- SCE BIO-7 Burrowing Owl Surveys
- SCE BIO-8 Nesting Bird Management Plan
- SCE BIO-9 Avoid and Minimize Impacts to Least Bell's Vireo and Southwestern Willow Flycatcher

Therefore, the proposed Project construction would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridor or impede the use of native wildlife nursery sites.

SCE Project Operation

Less than Significant Impact. Upon the start of SCE's Proposed Project operation, the Magundgen-Springville No. 1 and No. 2 Transmission Lines and distribution lines would operate in a similar manner as current lines. All O&M activities would be limited to existing disturbed areas. Therefore, no significant impact would result from continued operation of the Magundgen-Springville No. 1 and No. 2 Transmission Lines or the distribution lines and no additional mitigation measures are required.

Impact 3.4-5: *Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?*

Less Than Significant With Mitigation Incorporation. As described in Impact #3.4-2, expanding the capacity of the spillway would occasionally inundate approximately 421 acres of grassland, 44 acres of riparian woodland, and 97.6 acres of *Atriplex* scrub habitat during periods of high water. The 1999 FEIS/FEIR described 10 oak (*Quercus* spp.) trees as potentially being inundated from higher water levels after the proposed spillway raise. There would be a 12.5% chance each year that lake levels would rise above the existing gross pool elevation and less than 1% chance each year that lake levels would reach the new proposed gross pool elevation.

The downstream side of the riparian woodland would be covered by up to 10 feet of lake water at infrequent times, roughly once every eight years, for up 25 to 60 days. The upstream side of

the riparian woodland would be covered by less than one inch of water infrequently for up to three to five days. The areas in between would be flooded at depths between these two extremes based on the local topography. Mature cottonwood (*Populus fremontii*), sycamore (Platanus racemosa), and willow (Salix spp.) trees can tolerate flooding up to and beyond 60 days without high levels of mortality (Walters et al. 1980). Immature cottonwood saplings are not as flood tolerant and can have as much as 50% mortality after two weeks of flooding (Auchincloss et al. 2012). Thus cottonwood saplings could suffer periodic mortality on an infrequent basis, which could alter the current composition of the riparian woodland. Appropriate mitigation would be determined by the USFWS under the Fish and Wildlife Coordination Action. The 1999 FEIS/FEIR called for the Corps to mitigate impacts to the riparian woodlands by planting riparian trees along 83 acres of the Tule River and South Fork of the Tule River. See Mitigation Measure BIO-2. Implementation of Mitigation Measure BIO-2 would result in less than significant impacts.

SCE Scope of Work

SCE Project Construction

Less Than Significant Impact With Mitigation Incorporation. The Tulare County ordinance codes provide for the protection of plant resources in County Parks or Recreation Areas and sensitive significant habitats throughout the County. Sensitive significant habitats protected under these codes may be present within the Proposed Project area and potentially impacted by Proposed Project activities. Implementation of SCE mitigation measures SCE BIO-4 and SCE BIO-6 would reduce impacts to less than significant. Tulare County does not have a tree protection ordinance governing the removal or trimming of trees.

Further, the CPUC has sole and exclusive state jurisdiction over the construction of SCE's Proposed Project; therefore, local jurisdictions acting pursuant to local authority including local policies or ordinances protecting biological resources are preempted from regulating electric transmission and distribution line projects constructed by utilities subject to CPUC jurisdiction.

SCE Project Operation

No Impact. As local jurisdiction regulations are not applicable, SCE's Proposed Project operation would not conflict with any local policies or ordinances protecting biological resources.

Impact 3.4-6: *Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?*

No Impact. The Project is not located within an adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or other approved local, regional, or state habitat conservation plan. Therefore, the Project would not conflict with any such plans and there is no impact.

SCE Scope of Work

SCE Project Construction and Operation

No Impact. As with the overall larger Project, SCE's Proposed Project is not located within a HCP, NCCP, or other habitat conservation plan area. Therefore, construction and operation of SCE's Proposed Project would not conflict with the provisions of an adopted HCP, NCCP, or other approved local, regional, or state habitat conservation plan.

Mitigation Measures:

The mitigation measures listed below are assigned to either the Lead Agency or SCE. The Lead Agency will be responsible for implementation and compliance with the measures listed under "New Mitigation Measures proposed by Lead Agency" and SCE will be responsible for implementation and compliance with the measures listed under "New Mitigation Measures proposed by SCE (Utility Modifications)".

1999 FEIS/FEIR: The 1999 FEIS/FEIR included compensatory mitigation as follows: "Above the new gross pool elevation of 662.5 feet, mitigation for vegetation and wildlife includes planting a total of 82 acres of riparian vegetation on the Tule River arm of the lake, planting 100 oak seedlings on the Tule River or South Fork arms, and planting 150 acres of atriplex and associated shrubs on the wildlife area or adjacent lands at the north end of the lake. To compensate for Project-related effects to 421 acres of grasslands and to preserve habitat, 425 acres of grassland would be acquired on the Tule River arm of the lake and on the north side of Lake Success. To compensate for the effects to 867 acres of flooded acres in the Tulare lakebed, at least 247 acres of the Creighton Ranch along the Tule River near Corcoran would be acquired or reserved with an easement. Modifications to the existing levees, berms, and irrigation ditches at the ranch would allow intermittent seasonal flooding of low-lying areas. The seasonal flooding would occur when flood releases from Success Dam would otherwise cause damage in the Tulare lakebed. The seasonal flooding at Creighton Ranch would benefit waterfowl and shorebirds by providing additional water to this area to attract them to rest and forage during their seasonal migrations.

The riparian vegetation at the ranch could also receive benefits from the water. The planting contractor would be responsible for ensuring the successful establishment of vegetation over a 3-year period after construction of the Project. The non-Federal sponsor would be responsible for O&M of mitigation areas thereafter."

New Mitigation Measures proposed by Lead Agency:

BIO-1 The Corps would provide compensation for the potential loss of 421 acres of grassland around the perimeter of the lake from periodic inundation, by acquiring and preserving 293 acres of grassland. This grassland would be fenced and managed for wildlife. The Corps would provide compensation for the loss of 97.6 acres of Atriplex grassland habitat, which is now in the Kincade Cove Wildlife Management Area, by planting Atriplex community species on 28.6 acres of lands adjacent to or within the remaining wildlife management area, above the new gross pool (Figure 19). The area would be fenced to protect the plantings from livestock grazing. All plantings would be watered until they become established, which is typically three years. These lands would not be managed specifically for kit fox habitat, but would provide some kit fox habitat. The Corps has reinitiated consultation with the USFWS to confirm these updated mitigation commitments.

BIO-2 In addition to the mitigation described in BIO – 1, 1.88 acres of Project land above the new gross pool elevation would be planted with appropriate oak species. Watering and maintenance would occur for an appropriate amount of time to ensure establishment (generally three years). Impacts to the 44 acres of riparian woodlands would be mitigated for based on the recommendations of the USFWS. This mitigation coupled with the following BMPs would reduce impacts on wildlife and vegetation to less than significant:

- All off-road equipment and vehicles used for construction are required to be weed-free. All equipment and vehicles would be cleaned of all attached mud, dirt, and plant parts prior to arriving to the Project Area. This would be done at a vehicle washing station or steam cleaning facility (power or high-pressure cleaning) before the equipment and vehicles enter the Project Area.
- Weed infestations identified before construction that are within the Project Area would be treated.
- Staging areas for equipment, materials, or crews would not be located in weed infested areas.

- Weed-free equipment, mulches, and seed sources would be used. Salvage topsoil from Project Area for use in onsite revegetation, unless contaminated with noxious weeds.
- The amount of ground and vegetation disturbance in the construction areas would be minimized. Reestablish vegetation on all disturbed bare ground with native forbs and grasses to minimize weed establishment and infestation.
- Down case lighting would be implemented during any potential night work to minimize potential impacts to local wildlife.
- Woody vegetation that would need to be removed within the construction footprint would be removed during the non-nesting season to avoid affecting active bird nests.
- Avoid impacts to migratory birds nesting in trees along the access routes and adjacent to the proposed repair sites by conducting pre-construction surveys for active nests along proposed haul roads, staging areas, and construction sites. This would especially apply if construction begins in spring or early summer. Work activity around active nests would be avoided until the young have fledged. If construction commences during nesting season, a nesting bird survey would be conducted a minimum of a week in advance. Additionally, a survey would be conducted 24 hours in advance of the construction, to ensure no active nests. If active nests are located, USFWS would be contacted for Migratory Bird Treaty Act coordination.
- Avoid future impacts to the site by ensuring that fill materials are free of contaminants, such as invasive weed species or toxic materials.
- Minimize Project impacts by reseeding all disturbed areas, including staging areas, at the completion of construction with native forbs and grasses. Reseeding should be conducted just prior to the rainy season to enhance germination and plant establishment. The reseeding mix should include species used by and beneficial for native pollinators.

New Mitigation Measures proposed by SCE (Utility Modifications):

SCE BIO-1 Preconstruction Surveys and Biological Monitoring. Preconstruction surveys would be performed in SCE scope of work areas, as necessary, to avoid or minimize impacts on special-status plants, breeding birds, or wildlife species in areas with the potential for resources to be present. Where special-status species (e.g., reptiles, birds, mammals, and bat roosts) or unique resources (defined by

regulations and local conservation plans) are known to occur, biologists would monitor construction activities, unless otherwise mitigated for or as appropriate actions are described in resource-specific measures (see below). The biological monitors, in coordination with SCE or SCE's contractor, would be responsible for ensuring that impacts to special-status species, native vegetation, wildlife habitat, and unique resources are avoided to the extent feasible. Biological monitors would flag the boundaries of areas where activities need to be restricted to protect native plants and wildlife and/or special-status species. These restricted areas would be monitored for their protection during construction. If non-listed sensitive fauna are found within the impact area and could be harmed, the biological monitor would relocate the individual out of the impact area. If listed species are found within the impact area, only a biologist with the appropriate permit to handle that species would be allowed to relocate the individual. The biological monitor would have the authority to suspend any operation that is, in the qualified biologist's opinion, not consistent with any regulations or approved mitigation plans related to the protection of biological resources.

SCE BIO-2 Weed Management. All construction equipment, vehicles and tools must be cleaned and free of dirt and mud that can contain weed seeds before use at any construction yard or construction site. Any materials used in erosion-control or construction (straw, hay, wattles, gravel, soil, etc.) must be free of weeds. SCE will develop a Weed Management Plan that details how the above requirements will be met during construction of the project, including preconstruction surveys and mapping of existing weed species in the areas of SCE's scope of work, excluding ubiquitous weeds.

SCE BIO-3 Habitat Restoration Management Plan (HRMP). If impacts to special-status species cannot be avoided by the activities necessary to execute SCE's scope of work, impacts to native habitats will be mitigated through restoration, compensatory mitigation, or a combination of both as set forth by the appropriate resource agencies. A HRMP would be developed to address impacts to native habitats due to the execution of SCE's scope of work. The HRMP would detail compensatory mitigation strategies, if applicable; topsoil salvage and reapplication; special-status plant species restoration; nonnative plant removal; revegetation methods, including seeding and planting; timeline and sequence of implementation; monitoring and reporting; revegetation success standards; and adaptive management strategies. The appropriate agencies would be consulted

during development of the HRMP and the HRMP would be implemented in conjunction with applicable permit conditions and mitigation measures for SCE's scope of work.

SCE BIO-4 General Avoidance and Minimization of Impacts to Aquatic or Wetland Habitat. All ground-disturbing work in aquatic or wetland habitats necessary to perform SCE's scope of work will occur in dry conditions. Conducting ground-disturbing work during dry conditions will minimize potential runoff and dispersal of silt-laden water into Lake Success and other connected aquatic or wetland habitats. The timing will be dependent on seasonal rainfall. Measures specific to SCE's scope of work may include the following:

- Construction footprint for SCE's scope of work will be established to avoid disturbance to habitat to the greatest extent possible. Flagging or stakes will be used to establish the construction footprint. Encroachment outside the construction footprint will be prohibited.
- No equipment will be operated within aquatic habitat.
- Staging/storage areas for machinery, equipment, and materials for SCE's scope of work will be located outside of aquatic habitat.
- Any equipment or vehicles driven and/or operated for SCE's scope of work adjacent to aquatic habitat will be checked and maintained daily to prevent leaks of materials that if introduced to water could be deleterious to aquatic life, wildlife, or riparian habitat. Fueling and maintenance will not take place within 100 feet of aquatic habitat. Spill kits/absorbent clean-up materials will be available onsite and if used, disposed of properly.
- Fill construction materials other than onsite alluvium used for SCE's scope of work will consist of clean silt-free gravel or river rock.
- The limits of aquatic habitat will be flagged by a qualified ecologist. The contractor will not dump any litter or construction debris into aquatic habitat. All such debris and waste will be picked up daily and properly disposed of at an appropriate site.
- Silt control measures will be utilized throughout all phases of work necessary to perform SCE's scope of work where silt and/or earthen fill threaten to enter aquatic habitats. Silt control structures will be monitored for effectiveness and will be repaired or replaced as needed. Monitoring will occur in consultation with a qualified fisheries ecologist and will occur at least 48 hours prior to forecasted storm events.

- All temporarily disturbed aquatic habitat (due to SCE's scope of work) will be protected with correctly installed erosion control measures (jute, straw, coconut fiber erosion control fabric, coir logs, straw) and revegetated with propagules (seeds, cuttings, divisions) of locally collected native plants.

SCE BIO-5 Jurisdictional Waters. Impacts to potential Corps, RWQCB, and CDFW jurisdictional areas due to SCE's scope of work would be minimized to the extent feasible. Proposed activities in jurisdictional waters necessary for the execution of SCE's scope of work will be completed under dry conditions. Non-approved work areas would be marked as "off limits" in construction plans and/or maps and in the field. In areas where avoidance is not possible, SCE's scope of work will be permitted by Corps and RWQCB as part of the Corps' 408/404/401 permits for direct and indirect impacts to areas within Corps and RWQCB jurisdiction due to the Lake Success Enlargement Project. SCE will pursue, if necessary, a Streambed Alteration Agreement (SAA) from CDFW for direct and indirect impacts to areas within CDFW's jurisdiction due to SCE's scope of work. It is anticipated that the regulatory permit requirements would contain measures to avoid, reduce, and/or mitigate for impacts on their respective jurisdictions. SCE will submit the required materials and mitigation proposal for SCE's scope of work to the Corps to be included in the Corps' 408/404/401 permits. SCE would submit the required materials and mitigation proposal to CDFW for SCE's scope of work, if needed, as part of the regulated waters application process with CDFW. SCE would comply with all conditions as set forth in the regulated water permits that pertain to SCE's scope of work.

SCE BIO-6 Special-Status Plants. Pre-construction surveys would be performed by a qualified biologist to identify special-status plants located in SCE's scope of work component areas where habitat is present. Reference populations would be checked and presence/absence determination made as per protocol standards. If any special-status plant species are discovered within the impact area for SCE's scope of work, the impact boundary would be adjusted to avoid impacts to observed special-status plant species, unless the adjustment would impact worker or public safety. If avoidance is not possible, a qualified biologist would prepare and implement an HRMP (see HRMP measure above). Approval of the HRMP is required before impacts to the given plant species population is allowed. The HRMP would include the following elements: planting/seeding palettes, adaptive management strategies, monitoring schedule, performance criteria, and any

specific measures that will be required to ensure success of restoration for SCE's scope of work.

SCE BIO-7 Burrowing Owl Surveys. A preconstruction, focused burrowing owl survey would be conducted no more than 30 days prior to commencement of ground-disturbing activities within suitable habitat in the area of SCE's scope of work to determine if any occupied burrows are present. If occupied burrows are found, adequate buffers for SCE's scope of work would be established around burrows. Adequate buffers would be determined by an avian biologist based upon field conditions and resource agency guidelines for wintering burrows and breeding season burrows. A Burrowing Owl Management Plan would be developed inclusive of SCE's scope of work. The Plan would include information related to construction monitoring, avoidance and minimization measures, relocation strategy, exclusionary devices, and reporting requirements for SCE's scope of work.

SCE BIO-8 Nesting Bird Management Plan. A Nesting Bird Management Plan would be prepared and implemented inclusive of SCE's scope of work to address nesting birds. The Plan would be an adaptive management plan that may be updated as needed if improvements are identified or conditions in the field change. The Plan would include the following: nest management and avoidance, field approach (survey methodology, reporting, and monitoring), and avian biologist qualifications. The avian biologist would be responsible for oversight of the avian protection activities including the biological monitors. In order to minimize impacts to nesting birds during nesting season due to SCE's scope of work, preconstruction surveys and regular sweep surveys of active construction areas for SCE's scope of work by a qualified biologist would focus on breeding behavior and a search for active nests within 500 feet for raptors and 300 feet for non-raptors of disturbance areas associated with SCE's scope of work where survey access is not limited.

1. For vegetation clearing that needs to occur during the typical nesting bird season (February 1 to August 31; as early as January 1 for raptors), qualified biologists would conduct nesting bird surveys for SCE's scope of work. If an active nest (e.g., nests with eggs or chicks) was located, the appropriate avoidance and minimization measures from the management plan would be implemented. If it is determined that removal of an active nest is required, an

avian biologist will evaluate the appropriate level of consultation with CDFW and USFWS.

2. During the typical nesting bird season, preconstruction surveys would be conducted for SCE's scope of work no more than 10 days prior to initial start of construction of SCE's scope of work and in accordance with the adaptive management plan to determine the location of nesting birds and territories.
3. Nest monitoring would be conducted by biological monitors with knowledge of bird behavior under the direction of an avian biologist.
4. Nesting deterrents (e.g., mooring balls, netting, etc.) could be used for inactive nests, where appropriate, at the direction of the avian biologist.
5. The avian biologist would determine the appropriate buffer area around active nest(s) and provisions for buffer exclusion areas (e.g., highways, public access roads, etc.), along with construction activity limits. Unless restricted by the avian biologist, construction vehicles would be allowed to move through a buffer area with no stopping or idling. The avian biologist would determine, evaluate, and modify buffers as appropriate based on species tolerance and behavior, the potential disruptiveness of construction activities, and existing conditions for SCE's scope of work.

A biological monitor would observe and document implementation of appropriate buffer areas around active nest(s) during activities required for the performance of SCE's scope of work. The active nest site and applicable buffer would remain in place until nesting activity concluded. Nesting bird status reports for SCE's scope of work would be submitted according to the management plan.

SCE BIO-9 Avoid and Minimize Impacts to Least Bell's Vireo and Southwestern Willow Flycatcher. SCE would avoid ground-disturbing activities within habitat for least Bell's vireo and southwestern will flycatcher (vireo and flycatcher) during the nesting season. In the event that activities within vireo and flycatcher nesting habitat are unavoidable, a biologist permitted to survey by the USFWS would conduct pre-construction surveys for vireo and flycatcher no more than 7 days prior to initial start of construction, if work would occur between March 15 and September 30. Surveys would not be required after September 30 and before March 15. Surveys for vireo and flycatcher would be conducted in nesting habitat within approximately 500 feet of the proposed Project area. If a breeding territory or nest is confirmed and an exclusion buffer would be established around the nest in coordination with the USFWS and CDFW. Unless otherwise authorized by the

USFWS and CDFW, no proposed Project activities would occur within the established buffer until it is determined by the permitted biologist that the young have left the nest.

Cumulative Impacts:

The scope for considering cumulative impacts to biological resources are the geographic areas covered by the Tulare County General Plan / EIR and the City of Porterville General Plan / EIR. Mitigation measures associated with this topic are included to ensure that potential impacts to biological resources remains less than significant.

Implementation of the Project does not have the potential to contribute to the overall loss or degradation of sensitive habitats and is not likely to significantly affect protected species. Project mitigation measures, described herein, would limit potential significant impacts to a less than significant level for special status species. Phase 2 of the Tule River Spillway Enlargement Project would stochastically create new grassland, wetland, and woodland habitats dependent on rainfall in the watershed. The spillway raise would increase the maximum reservoir elevation during years of excessive rainfall, but it would not change the water levels during droughts and the micro-environments created with lower water levels. Other Federal projects occurring in the area are required to comply with the requirements of the Endangered Species Act, while State and local projects are required to comply with Section 10 of the Endangered Species Act.

Cumulative impacts to special status species would be temporary, lasting two to three years, and once construction is complete, fish and wildlife resources should recover to pre-Project conditions with the implementation of the mitigation measures. The Project would not add to these cumulative effects, as the majority of the Project impacts would be temporary, and disturbed areas would be revegetated. For these reasons, cumulative impacts are considered ***less than cumulatively considerable.***

3.5 Cultural Resources

This section of the SEIR evaluates the potential impacts to Cultural Resources associated with implementation of the proposed Project. No NOP comments were received pertaining to Cultural Resources.

Determination of Adequacy of 1999 FEIS/FEIR

The proposed Project footprint and area of potential effect (APE), as well as the proposed new maximum gross pool elevation raise has not changed since evaluation in the 1999 FEIS/FEIR; however, the CEQA Guidelines have been updated to include revised questions related to cultural resources impacts. Therefore, the following determinations are made:

Topic	Further Analysis Required?	1999 FEIS/FEIR Analysis Sufficient?
a. Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	✓	
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	✓	
c. Disturb any human remains, including those interred outside of formal cemeteries?	✓	
d. Would the project directly or indirectly destroy a unique paleontological resource or site or unique geological feature?	✓	

Discussion:

Impacts to cultural resources were evaluated in the 1999 FEIS/FEIR; however, the CEQA Guidelines have been amended to require additional analysis. As such, this SEIR evaluates potential Project-related impacts to cultural resources.

Environmental Setting

Cultural resources are broadly defined as buildings, structures, objects, sites, districts, and archeological resources associated with human activity in prehistory or history. For the purposes of the current assessment, "prehistory" refers to a time period prior to the arrival of Spanish and other Euro-American explorers and settlers into the Project area, when the area was inhabited only by Native American peoples, described below as the Prehistoric Setting.

Prehistoric Setting

Radiometric dating techniques place human habitation along portions of coastal California to well before 12,000 years ago. Areas along the shoreline of ancient Tulare Lake, in Kings County, also show evidence of early Holocene occupation, dating to 8,000 years before present (BP) or earlier. Based on archaeological and linguistic evidence, Native Americans ancestral to present-day Yokuts tribes lived the area around present-day Lake Success for 5,000 to 7,000 years. This area, where several forks of the Tule River converge, provided a rich base for human subsistence and permanent and semi-permanent settlements. Native American peoples occupying this region employed an economic strategy involving seasonal rounds, with the valley, foothills, and higher elevations of the Sierra Nevada range offering a wide variety of plant, animal, and other resources.

Beginning around 3,000 years ago, acorns increasingly gained dietary importance throughout California, and archaeological evidence indicates they were a staple of the local diet by 2,000-1,500 years BP. In the southern San Joaquin Valley and foothills, intensification of plant use and increased residential mobility is seen as corresponding with a period of widespread climate change in California around 1000 years ago, known as the Medieval Climatic Anomaly.

After around 800 years ago, land use practices again centered on permanent or semi-permanent villages. In the current Project area this pattern likely continued to the contact period. Previous archaeological work around Lake Success has located several prehistoric sites, many of which comprise bedrock milling features used for processing acorns and other plant and mineral

resources. While the cultural sequence within the Project area remains relatively undefined, in general the prehistoric record suggests relatively high population densities.[1]

Occasional European intrusion into the area began around A.D. 1772, but the absence of Spanish missions in the lower San Joaquin Valley somewhat limited early contact between native and non-native peoples. By way of example, the malaria epidemic of 1833, which devastated the northern San Joaquin Valley, appears not to have penetrated into the nearby Tulare Valley (Phillips 1993:94). Native American populations who escaped decimation by disease in this region were able to maintain seasonal rounds and trade contacts into the late nineteenth and early twentieth centuries.

Native American Ethno-history

The current Project area is located near the convergence of the Southern Valley and the Foothill Yokuts territories. The territory of the larger Southern Valley Yokuts reportedly extended from the Coastal Ranges to the west, Fresno to the North, the Tehachapi Foothills in the south and into the Sierra Foothills to the east almost to the current Tule River Indian Reservation. Of the Southern Valley Yokuts, the Koyeti lived along the lower Tule River, with several ethno-historic Koyeti situated along the Tule River in the vicinity of Porterville. These included the Chokowisho, Tenalu, and Chetetik Nowsuh.[2]

Foothill Yokuts territory is thought to have covered a much smaller area consisting of fragmented areas around the Tule, Kings, San Joaquin, Fresno, Kaweah, and Poso Rivers. Foothill Yokuts Tribes located closest to Success Valley included the Yawdanchi near the North Fork of the Tule River and the Hoeynche situated along the South Fork of the Tule River. While the Project area is within known Yokuts boundaries, trade and interaction with other ethnically and linguistically distinct tribes, such as the Mono and Tübatulabal, was common.

In the 1850s, some Yokuts peoples, especially Foothill Yokuts, labored at agriculture on the Tule River Farm near the town of Porterville.[3] In 1864, the Tule River Farm became the Tule River Indian Reservation. In 1873, the reservation of the government-reformulated Tule River Tribe, now consisting of Yokuts, Mono, and Tübatulabal members, was re-located to a more mountainous, less economically-productive, area approximately 15 miles to the east and upslope

[1] Berryman LE, Elsasser AB. 1966. Terminus Reservoir: Geology, Paleontology, Flora and Fauna, Archaeology, History. National Park Service Inter-agency Archeological Salvage Program. U.S. Army Corps of Engineers, Sacramento District.
[2] Reddy S (editor), White W, Minor J, Chapman E. 2008. Archaeological Survey and Testing for the Proposed Seismic Remediation Project at Lake Success, Tulare County, California. Prepared by Statistical Research, Inc. for USACE, Sacramento District.
[3] Ibid.

from Porterville. Cultural resources dating to the ethno-historic period may be present in the Project area.

Historic-era Setting

The first documented contact between indigenous groups of the area and Europeans was in 1772, when Spanish explorers with the Fages party entered the region. Contact was largely limited in the following decades, until the early 19th century when the Spanish government and the Catholic Church began sending missionization expeditions into the southern San Joaquin Valley. These efforts to missionize the local Yokuts were not particularly successful. Conflicts between the European and native populations during the Mexican period of California history were more frequent than in the preceding period.[4]

Gold was discovered in the early 1850s east of the Success Valley in the Globe District and on Cow Mountain. In subsequent years, several gold and silver claims were staked in these areas, albeit with limited success. In 1859, the location of Porterville was established by Porter Putnam as a spot for his hotel and store. Both of the enterprises were built to service overland stagecoach traffic between San Francisco and Los Angeles. The town site also was an important supply stop along the route from the valley to gold mines northeast in the Sierra Nevada.

Even though gold and silver mining in Tulare County was not hugely successful, magnesite mining did later have an economic impact on the region. Magnesite deposits in the Porterville area were first discovered by W. P. Blake in 1853 during a U.S. expedition and survey for a railroad. Extraction of magnesite in the region did not begin in earnest until the early part the 1900s, following restrictions on foreign shipments of this mineral during European wars. At this time, the entire domestic production of magnesite was from California, with the vast majority of the mineral extracted from Tulare County in the areas around Porterville, Success, and Lindsay.

Although mining continued in subsequent decades to be a major industry in the San Joaquin Valley, agriculture and ranching also grew in economic importance, with large herds of cattle and sheep brought into the valley to graze. Ranching and agriculture continued to be primary sources of revenue for families in the Success Valley well into the 20th century. The establishment of agriculture and ranching in the Success Valley prompted several irrigation projects to be

[4] Wallace WJ. 1978. Southern Valley Yokuts. In California, edited by Robert F. Heizer, pp. 459-460. Handbook of North American Indians, vol. 8, William C. Sturtevant, general editor. Smithsonian Institution, Washington DC.

undertaken. One of the most notable of these near the Project area was the Pioneer Ditch. The Pioneer Ditch was dug over a seven-year period between 1860 and 1867 to provide water a local flour mill, reduce flood damage, and later to turn turbines for electricity production for Porterville.[5]

In addition to irrigation, another major contributor to the success of the agricultural industry was rail transportation of goods and livestock to markets outside the region. The Southern Pacific Railroad was the first to reach Porterville in 1888. As a result, the town underwent a population increase, as well as an increase in exported fruit production and, to a lesser extent, other crops including raisins, grapes, and lemons.[6]

Construction of Richard L. Schafer Dam began in 1958 and was completed on May 15, 1961. The dam provides flood risk reduction benefits to the city of Porterville and other communities downstream of the dam. In addition, the dam helps protect several hundred thousand acres of valuable farmland to the west of the dam from damaging winter and spring floods. In 1999, during preparation of the Tule River Basin Investigation Feasibility Study and FEIS/FEIR[7], Richard L. Schafer Dam was evaluated for historic significance and determined not eligible for inclusion on the National Register of Historic Places (NRHP), with consensus from the California State Historic Preservation Officer (SHPO) (October 15,1999 [COE990720A]). Given the passage of time since that previous determination, through correspondence dated September 18, 2019, the Corps reinitiated consultation with the SHPO regarding the determination that Richard L. Schafer Dam is not eligible for inclusion in the NRHP. The SHPO concurred with that determination through correspondence dated November 5, 2019.

[5] Meighan C, Dillon BD, Armstrong DV (editors). 1988. Success Lake Intensive Cultural Resources Survey. Institute of Archaeology, University of California, Los Angeles. Submitted to USACE, Sacramento District. Contract DACW05-83-C-0107.

[6] Reddy S (editor), White W, Minor J, Chapman E. 2008. Archaeological Survey and Testing for the Proposed Seismic Remediation Project at Lake Success, Tulare County, California. Prepared by Statistical Research, Inc. for USACE, Sacramento District.

[7] [Corps] United States Army Corps of Engineers. 1999. Tule River Basin Investigation, California. Final Feasibility Report and Final Environmental Impact Statement. Environmental Impact Report. Sacramento, California. 476 pgs.

Regulatory Setting

Federal

Section 106

The proposed Project intersects lands owned and managed by the Corps and therefore qualifies as an undertaking of the Corps' Sacramento District under 36 CFR 800. The Corps will be the lead agency for federal regulatory compliance, including Section 106 of the National Historic Preservation Act and its implementing regulations. The following regulations, laws, and acts constitute the primary corpus of cultural resource management procedures and requirements for federal undertakings.

Section 106 of the National Historic Preservation Act requires federal agencies to consult with the Advisory Council on Historic Preservation to take into account the effects of their undertakings on historic properties, and the procedures in 36 CFR 800 define how federal agencies meet these responsibilities. 36 CFR 800.5(a) describes procedures for evaluating a project's adverse effects on cultural resources. An adverse effect is found when a federal undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register of Historic Places (NRHP) in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Examples of adverse effects are provided in 36 CFR 800(a)(2) and include, but are not limited to, the following:

- Physical destruction of or damage to all or part of the property
- Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines
- Removal of the property from its historic location
- Change of the character of the property's use or of physical features within the property's setting that contributes to its historic significance
- Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features

- Neglect of a property that causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization

- Transfer, lease, or sale of property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

NRHP Eligibility Criteria

National Park Service regulation 36 CFR 60 is the primary reference for determining the historical significance of a cultural resource. The regulation defines the criteria by which a property is determined to be eligible for listing in the NRHP as:

> The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that (a) are associated with events that have made a significant contribution to the broad patterns of our history; or (b) that are associated with the lives of persons significant in our past; or (c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant distinguishable entity whose components may lack individual distinction; or (d) that have yielded or may be likely to yield information important in history or prehistory.

Archaeological Resources Protection Act

The Archaeological Resources Protection Act of 1979 provides for the protection of archaeological resources more than 100 years old and which occur on federally owned or controlled lands. The statute makes it unlawful to excavate and remove items of archaeological interest from federal lands without a permit, and it defines the process for obtaining such a permit from the responsible federal agency. This process includes a 30-day notification to interested persons, including Indian tribes, by the agency to receive comments regarding the intended issuing of a permit. The law establishes a process for prosecuting persons who illegally remove archaeological materials from lands subject to the Archaeological Resources Protection Act. The law also provides for curation of archaeological artifacts, ecofacts, notes, records, photographs, and other items associated with collections made on federal lands. Standards for curation are provided for in regulations in 36 CFR 79.

National Environmental Policy Act (NEPA, 42 United States Code 4321) of 1970

NEPA requires the federal government to carry out its plans and programs in such a way as to, "preserve important historic, cultural, and natural aspects of our national heritage" (42 United States Code [USC] §4331(b)(4)). The intent of the statute is to require that agencies obtain sufficient information regarding historic and cultural properties (including consulting, for example, appropriate members of the public; local, state, and other federal government agencies; and Indian tribes, organizations, and individuals) to make a determination of the historical and cultural significance of affected historic or cultural properties and to take into account whether irreversible adverse impacts to such resources can or should be avoided, minimized, or mitigated.

Native American Graves Protection and Repatriation Act

The Native American Graves Protection and Repatriation Act of 1990 provides a process for museums and federal agencies to return certain Native American "cultural items" (i.e., human remains, funerary objects, sacred objects, and objects of cultural patrimony) to lineal descendants, culturally affiliated Indian tribes (i.e., tribes recognized by the Secretary of the Interior), and Native Hawaiian organizations, if the legitimate cultural affiliation of the cultural items can be determined according to the law. Museums, as defined under the statute, are required to inventory cultural items in their possession and determine which items can be repatriated to the appropriate party. Cultural items intentionally or unintentionally excavated and removed from federal lands may be subject to the Native American Graves Protection and Repatriation Act.

American Indian Religious Freedom Act

The American Indian Religious Freedom Act of 1978 directs federal agencies to consult with Native Americans to determine appropriate procedures to protect the inherent rights of Native Americans to believe, express, and exercise their traditional religions including, but not limited to, access to sites, use and possession of sacred objects, and freedom to worship through ceremonials and traditional rites.

Executive Order (EO) 13007

EO 13007 directs that, in managing federal lands, each executive branch agency with statutory or administrative responsibility for the management of federal lands shall, to the extent practicable, permitted by law, and not clearly inconsistent with essential agency functions: (1) accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and (2) avoid adversely affecting the physical integrity of such sacred sites. Where appropriate, agencies shall

maintain the confidentiality of sacred sites. The EO requires that affected agencies establish a process for implementing the EO.

EO 13175

EO 13175 was issued to establish regular and meaningful consultation and collaboration with tribal officials in the development of federal policies that have tribal implications, to strengthen the United States government-to-government relationships with Indian tribes, and to reduce the imposition of unfunded mandates upon Indian tribes. "Indian tribe" means an Indian or Alaska Native tribe, band, nation, pueblo, village, or community that the Secretary of the Interior acknowledges to exist as an Indian tribe pursuant to the Federally Recognized Indian Tribe List Act of 1994, 25 USC 479a. Relevant federal agencies are directed to establish policies and procedures for implementing consultation with federally recognized tribes on a government-to-government basis.

EO 13287

EO 13287 establishes that, among other things, it is the policy of the federal government to provide leadership in preserving America's heritage by actively advancing the protection, enhancement, and contemporary use of the historic properties owned by the federal government, and by promoting intergovernmental cooperation and partnerships for the preservation and use of historic properties. The federal government shall recognize and manage the historic properties in its ownership as assets that can support department and agency missions while contributing to the vitality and economic well-being of the Nation's communities and fostering a broader appreciation for the development of the United States and its underlying values.

Federal Land Management and Policy Act of 1976, as amended (43 USC 1701 et seq.)

The Federal Land Management and Policy Act defines significant fossils as unique, rare, or particularly well-preserved; an unusual assemblage of common fossils; being of high scientific interest; or providing important new data concerning (1) evolutionary trends, (2) development of biological communities, (3) interaction between or among organisms, (4) unusual or spectacular circumstances in the history of life, (5) or anatomical structure.

Omnibus Public Lands Act of 2009

Omnibus Public Lands Act (OPLA) directs the Secretaries (Interior and Agriculture) to manage and protect paleontological resources on federal land using "scientific principles and expertise." OPLA incorporates most of the recommendations of the report of the Secretary of the Interior

entitled "Assessment of Fossil Management on Federal and Indian Lands"[8] to formulate a consistent paleontological resources management framework. In passing the OPLA, Congress officially recognized the scientific importance of paleontological resources on some federal lands by declaring that fossils from these lands are federal property that must be preserved and protected. The OPLA codifies existing policies of the BLM, National Park Service, U.S. Forest Service, Bureau of Reclamation, and U.S. Fish and Wildlife Service, and provides the following:

- Uniform criminal and civil penalties for illegal sale and transport, and theft and vandalism of fossils from federal lands
- Uniform minimum requirements for paleontological resource-use permit issuance (terms, conditions, and qualifications of applicants)
- Uniform definitions for "paleontological resources" and "casual collecting"

Uniform requirements for curation of federal fossils in approved repositories Federal legislative protections for scientifically significant fossils applies to projects that take place on federal lands (with certain exceptions such as Department of Defense), involve federal funding, require a federal permit, or involve crossing state lines. The proposed Project crosses federal land administered by the Corps. Due to the presence of federal jurisdiction associated with the proposed Project, federal protections for paleontological resources for those areas apply under NEPA, Federal Land Policy and Management Act, and OPLA Paleontological Resources Plan. All paleontological work on Corps lands must be approved and coordinated by the Corps. All fossils collected from Corps lands must be housed in a federally approved paleontological repository. The paleontological repository for the proposed Project must be identified if impacts to a paleontological resource are expected.

State

State regulations affecting cultural resources include PRC Sections 21083.2 and 21084.1, and CEQA Guidelines Section 15064.5, and Appendix G of the CEQA Guidelines.

Cultural resources, as defined in CEQA, include prehistoric- and historic-era archaeological sites, districts, and objects; historic buildings, structures, objects, and districts; and traditional/cultural sites or the locations of important historic events. CEQA Guidelines Section 15064.5 states that a project may have a significant environmental effect if it causes a substantial adverse change in

[8] Department of the Interior. 2000. *Assessment of Fossil management on Federal and Indian Lands. Report of the Secretary of the Interior.*

the significance of a historic resource. Additionally, the Lead Agency must consider properties eligible for listing in the California Register of Historical Resources (CRHR) or that are defined as a unique archaeological resource in Public Resources Code Section 21083.2.

California Register of Historical Resources

Cultural resources include archaeological and historic objects, sites, and districts, historic buildings and structures, and sites and resources of concern to local Native Americans and other ethnic groups. Cultural resources that meet the criteria of eligibility to the CRHR are termed "historical resources." Archaeological resources that do not meet CRHR criteria also may be evaluated as "unique;" impacts to such resources could be considered significant, as described below.

A site meets the criteria for inclusion in the CRHR if:

- It is associated with events that have made a significant contribution to the broad patterns of California's History and Cultural Heritage.
- It is associated with the life or lives of a person or people important to California's past.
- It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
- It has yielded, or may be likely to yield, information important to prehistory or history.

A resource eligible for the CRHR must meet one of the criteria of significance described above and retain enough of its historic character or appearance (integrity) to be recognizable as a historical resource and to convey the reason for its significance. It is possible that a historic resource may not retain sufficient integrity to meet the criteria for listing in the National Register, but it may still be eligible for listing in the CRHR.

The CRHR automatically includes the following:

- California properties listed on the National Register and those formally Determined Eligible for the National Register
- California Registered Historical Landmarks from No. 770 onward

- Those California Points of Historical Interest that have been evaluated by the California Office of Historic Preservation (OHP) and have been recommended to the State Historical Commission for inclusion in the CRHR

The following are other resources that may be nominated to the CRHR:

- Historical resources with a significance rating of Category 3 through 5
- Individual historical resources
- Historical resources contributing to historic districts
- Historical resources designated or listed as local landmarks, or designated under any local ordinance, such as an historic preservation overlay zone

Impacts to "unique archaeological resources" also are considered under CEQA, as described under PRC 21083.2. A unique archaeological resource means an archaeological artifact, object, or site about which it can be clearly demonstrated that without merely adding to the current body of knowledge, there is a high probability that it meets one of the following criteria:

- Contains information needed to answer important scientific questions and there is a demonstrable public interest in that information
- Has a special and particular quality, such as being the oldest of its type or the best available example of its type
- Is directly associated with a scientifically recognized important prehistoric or historic event or person
- A non-unique resource is one that does not fit the above criteria

California Environmental Quality Act (CEQA) of 1970, as amended

CEQA generally requires state and local government agencies to inform decision makers and the public about the potential environmental impacts of proposed projects and to reduce those environmental impacts to the extent feasible.

California Public Utilities Commission (CPUC) General Order (G.O.) 95

CPUC G.O. 95 Rules for Overhead Line Construction provides general standards for the design and construction of overhead electric transmission lines.

CPUC

CPUC has sole and exclusive state jurisdiction over the siting and design of the utility facility replacement portion of the proposed Project. Pursuant to CPUC G.O. 131-D, Section XIV.B, "Local jurisdictions acting pursuant to local authority are preempted from regulating electric power line projects, distribution lines, substations, or electric facilities constructed by public utilities subject to the CPUC's jurisdiction. However, in locating such projects, the public utilities shall consult with local agencies regarding land use matters." Consequently, public utilities are directed to consider local regulations and consult with local agencies, but the county's and cities' regulations are not applicable as the county and cities do not have jurisdiction over utility facilities.

Local

Tulare County

The Tulare County General Plan (2012) includes several policies aimed at protecting cultural resources that apply to projects within unincorporated Tulare County jurisdiction:

- ERM-6.2 Protection of Resources with Potential State or Federal Designations—The County shall protect cultural and archaeological sites with demonstrated potential for placement on the National Register of Historic Places and/or inclusion in the California State Office of Historic Preservation's California Points of Interest and California Inventory of Historic Resources. Such sites may be of statewide or local significance and have anthropological, cultural, military, political, architectural, economic, scientific, religious, or other values as determined by a qualified archaeological professional.

- ERM-6.3 Alteration of Sites with Identified Cultural Resources—When planning any development or alteration of a site with identified cultural or archaeological resources, consideration should be given to ways of protecting the resources. Development can be permitted in these areas only after a site-specific investigation has been conducted pursuant to CEQA to define the extent and value of resource, and mitigation measures proposed for any impacts the development may have on the resource.

- ERM-6.4 Mitigation—If preservation of cultural resources is not feasible, every effort shall be made to mitigate impacts, including relocation of structures, adaptive reuse, preservation of facades, and thorough documentation and archival of records.

- ERM-6.8 Solicit Input from Local Native Americans—The County shall continue to solicit input from the local Native American communities in cases where development may result

in disturbance to sites containing evidence of Native American activity and/or to sites of cultural importance.

- ERM-6.10 Grading Cultural Resources Sites—The County shall ensure that all grading activities conform to the County's Grading Ordinance and California Code of Regulations, Title 20, § 2501 et. seq.

Thresholds of Significance

The thresholds of significance for this section are established by the CEQA Checklist Item.

- Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?
- Disturb any human remains, including those interred outside of formal cemeteries?
- Would the project directly or indirectly destroy a unique paleontological resource or site or unique geological feature?

Impacts and Mitigation Measures

Impact 3.5-1: *Cause a substantial adverse change in the significance of a historical or archaeological resource pursuant to §15064.5?*

Less Than Significant With Mitigation Incorporation. The proposed Project would include the left abutment spillway cut, spillway raise (i.e., ogee weir construction within the enlarged spillway), land acquisitions and utility relocations, and armoring of the Highway 190 Bridge and Frazier Dike to prevent impacts from the higher gross reservoir pool. This action involves activities that have the potential to cause effects on historic properties and archaeological resources (36 CFR § 800.3(a)).

The Corps has completed efforts to identify and evaluate historic properties in the APE for the proposed Project; however, as described at 36 CFR § 800.1(c), the Corps must complete the Section 106 process for the entire undertaking, comprising all phases of the Tule River Spillway Enlargement Project, prior to approving the expenditure funds for the proposed Project. Given the extensive nature of the combined APE for all phases of the undertaking, which includes more than 300 acres on both public and private lands surrounding Lake Success, a phased approach to Section 106 compliance for the undertaking is required. In accordance with 36 CFR § 800.4(b)(2),

in order to phase the identification and evaluation of historic properties under Section 106, execution of a Programmatic Agreement (PA) is required, pursuant to 36 CFR § 800.14(b)(1)(ii).

The Corps notified the ACHP and California SHPO of the need for a PA to govern the Section 106 process for the Tule River Spillway Enlargement Project and consulted with the SHPO on the PA development. The Corps also initiated Section 106 consultation regarding this undertaking and PA with the following Indian tribes and Native American communities identified by the California Native American Heritage Commission as having cultural resources interests in the APE: Tule River Indian Tribe, Santa Rosa Rancheria Tachi Yokut Tribe, Kern Valley Indian Community, Tubatulabals of Kern Valley, and Wuksache Indian Tribe/Eshom Valley Band. The PA was fully executed between the Corps and the SHPO on December 13, 2019. The Corps will continue to consult with SHPO and Native American interested parties throughout Project construction as described in the PA. Potential impacts to historical and archaeological resources will be less than significant with implementation of mitigation measures.

SCE Project Components

In 2016, AECOM prepared a Cultural Resources Survey Report for the transmission portion of SCE's utility replacement component of the Project.[9] The study consisted of a records search review, intensive pedestrian survey of the SCE Project APE, and documentation of cultural resources identified within the APE. Historic General Land Office plat and the United States Geological Survey topographic maps and various archival records were also used to identify historic structures and land uses in the Project vicinity. Table 3.5-1 lists the findings from the 2016 AECOM and 2017 Petra[10] studies, which include NRHP and CRHR eligibility recommendations, and impact analysis for the sites identified within the APE of SCE's Proposed Project components.

Table 3.5-1 – NRHP and CRHR Eligibility and Impact Analysis of Cultural Resources

Site Number	Description	NRHP Eligibility	CRHR Eligibility	Impact Analysis
CA-TUL-972	Multicomponent bedrock milling site	Not Eligible[11]	Recommended Not Eligible[12] though the possible presence of a	Less than significant impact with

[9] AECOM. 2016. *Cultural Resources Survey Report for the Proposed Southern California Edison Company's Lake Success Transmission Line Project, Tulare County, California*. Prepared for Southern California Edison.
[10] Petra Resource Management. 2018. *Lake Success Transmission Project Cultural Resources Technical Memorandum*. Prepared for CH2M. May.
[11] Office of Historic Preservation (OHP). 2012. *Archaeological Determinations of Eligibility for Tulare County. California.* On file at the Southern San Joaquin Valley Information Center.
[12] AECOM. 2016. *Cultural Resources Survey Report for the Proposed Southern California Edison Company's Lake Success Transmission Line Project, Tulare County, California*. Prepared for Southern California Edison.

	with historic artifacts		deeply buried cultural sequence below alluvium may change eligibility status.	implementation of CUL-2, CUL-3 and CUL-4
CA-TUL-2667	Recorded in 2008 as a historic ranching complex recorded by SRI dating to the 1920's and likely destroyed during the 1960's as a result of land transfer	Not Eligible[13]	Recommended Not Eligible[14]	There will be no impact as a result of this project.
CA-TUL-2668	Recorded in 2008 by SRI as a historic gate valve with associated features, likely associated with CA-TUL-2667	Not Eligible[15]	Recommended Not Eligible[16]	There will be no impact as a result of this project.
P-54-004577	Recorded as a historic ancillary building, possibly a chicken coop, in 2008 by SRI.	Not Eligible[17]	Recommended Not Eligible[18]	There will be no impact as a result of this project.
P-54-005027	Vincent 220-kilovolt (kV) Transmission Line	Determined eligible by the California OHP for listing in the NRHP, as a contributing element to the Big Creek	P-54-005027 was also previously evaluated and found eligible for listing in the CRHR concurrent with the	AECOM (2016) recommended a finding of adverse impact to the resource as it

[13] Office of Historic Preservation (OHP). 2012. *Archaeological Determinations of Eligibility for Tulare County. California.* On file at the Southern San Joaquin Valley Information Center.

[14] AECOM. 2016. *Cultural Resources Survey Report for the Proposed Southern California Edison Company's Lake Success Transmission Line Project, Tulare County, California*. Prepared for Southern California Edison.

[15] Office of Historic Preservation (OHP). 2012. *Archaeological Determinations of Eligibility for Tulare County. California.* On file at the Southern San Joaquin Valley Information Center.

[16] AECOM. 2016. *Cultural Resources Survey Report for the Proposed Southern California Edison Company's Lake Success Transmission Line Project, Tulare County, California*. Prepared for Southern California Edison.

[17] Office of Historic Preservation (OHP). 2012. *Archaeological Determinations of Eligibility for Tulare County. California.* On file at the Southern San Joaquin Valley Information Center.

[18] AECOM. 2016. *Cultural Resources Survey Report for the Proposed Southern California Edison Company's Lake Success Transmission Line Project, Tulare County, California*. Prepared for Southern California Edison.

		Hydroelectric System Historic District, which was listed in August 2016.	NRHP evaluation in 2012.[19] The current Magunden-Springville No.1 220-kV Transmission Line is a segment of the historic Vincent 220-kV Transmission Line.[20]	intersects the APE/API. As a result of the removal of the original towers, the proposed Project will have an impact on the Vincent 220kV Transmission Line. The impacts will be reduced to less than significant level with implementation of CUL-1.
P-54-005275	Recorded as a historic culvert by AECOM (2016) pursuant to the proposed Project.	Archival research by AECOM suggested that the culvert lacked association with broader construction of Lake Success Dam in the 1950s and 1960s.[21] As a result, AECOM recommended the site as ineligible for inclusion on the NRHP.	Recommended not eligible for listing in the CRHR and the NRHP.[22]	There will be no impact as a result of this project.
P-54-005276	Recorded as a historic culvert by AECOM (2016) pursuant to the proposed Project	Archival research by AECOM suggested that the culvert lacked association with broader construction of Lake Success Dam in the 1950s	Recommended not eligible for listing in the CRHR and the NRHP.[24]	There will be no impact as a result of this project.

[19] Office of Historic Preservation (OHP). 2012. *Archaeological Determinations of Eligibility for Tulare County. California.* On file at the Southern San Joaquin Valley Information Center.

[20] Petra Resource Management. 2018. *Lake Success Transmission Project Cultural Resources Technical Memorandum*. Prepared for CH2M. May.

[21] AECOM. 2016. *Cultural Resources Survey Report for the Proposed Southern California Edison Company's Lake Success Transmission Line Project, Tulare County, California*. Prepared for Southern California Edison.

[22] Ibid.

[24] Ibid.

		and 1960s.[23] As a result, AECOM recommended the site as ineligible for inclusion on the NRHP.		
P-54-005277	Recorded as a historic dike by AECOM (2016) pursuant to the proposed Project.	AECOM (2016) performed archival research to determine the dike's relationship within the larger context of the Success Dam infrastructure and found its construction to date to the late 1950s or early 1960s and has undergone subsequent modifications in following decades, altering the setting and integrity of the resource. As a result, AECOM (2016) recommended the site ineligible for inclusion into the NRHP.	Recommended not eligible for listing in the CRHR and the NRHP.[25]	There will be no impact as a result of this project.
P-54-005278	Recorded as a USACE historic survey marker by AECOM (2016) pursuant to the proposed Project	AECOM (2016) recommended the marker ineligible for inclusion into the NRHP	Recommended not eligible for listing in the CRHR and the NRHP.[26]	There will be no impact as a result of this project.
Springville Substation	Consists of six structures constructed in 1947 – 1948	Petra (2018) recommended that the buildings of the Springville Substation should not be considered	Recommended Not Eligible.[27]	There will be no impact as a result of this project.

[23] Ibid.

[25] AECOM. 2016. *Cultural Resources Survey Report for the Proposed Southern California Edison Company's Lake Success Transmission Line Project, Tulare County, California*. Prepared for Southern California Edison.

[26] AECOM. 2016. *Cultural Resources Survey Report for the Proposed Southern California Edison Company's Lake Success Transmission Line Project, Tulare County, California*. Prepared for Southern California Edison.

[27] Petra Resource Management. 2018. *Lake Success Transmission Project Cultural Resources Technical Memorandum*. Prepared for CH2M. May.

		eligible either individually or as contributors to a potential historic district and recommended that Springville Substation not be considered eligible for the inclusion into the NRHP or for listing in the CRHR under any applicable criteria.		

The Lake Success Transmission Project Cultural Resources Technical Memorandum (Petra, 2018) evaluated the potential for historical resources within the APE of SCE's transmission Project components, as defined in Section 15064.5. As summarized in Table 3.5-1, ten cultural resources sites are located within the APE. Nine of the 10 sites are recommended as not eligible for the NRHP or CRHR; therefore, they will not be impacted by SCE's Proposed Project components.

SCE's Proposed Project components would result in a significant impact to the Vincent 220-kV Transmission Line resources under CEQA as defined in California Public Resources Code Section 15064.5. Construction of the Project will remove 15 original towers, which are character-defining features of the Vincent 220-KV Transmission Line, and replace them with 14 new structures. These proposed activities would materially alter, in an adverse manner, those physical characteristics of the resource that qualify it as eligible for inclusion in the CRHR. Mitigation would minimize impacts on this resource by conclusive documentation of the Vincent 220-kV Transmission Line in accordance with the National Park Service Historic American Engineering Record standards, as well as Department of Parks and Recreation 523 forms. This documentation would be filed with the California Historical Resources Information System, and the National Park Service. Therefore, impacts to historical resources would be less than significant with mitigation.

The Lake Success Transmission Project Cultural Resources Technical Memorandum (Petra, 2018) also evaluated the potential for impacts to archaeological resources pursuant to Section 15064.5. As summarized in Table 3.5-1, the evaluation found that eight archaeological sites are located within the APE of SCE's Proposed Project components. One archaeological site, CA-TUL-972, is a prehistoric bedrock milling site with historical debris and a 1956 Corps survey marker. This site is not eligible for NRHP (OHP, 2012) and is recommended as not eligible for the CRHR (AECOM, 2016); however, the site may have a potentially intact subsurface deposit buried under alluvial

sediments encountered at 65 centimeters below the present site surface, that may change the eligibility status, if encountered. The implementation of mitigation measures would mitigate impacts to less-than-significant levels of unidentified unique archaeological resources.

A portion of the SCE's distribution Project component APE has not been surveyed. These areas compose approximately 41.63 acres, which is 18.1 percent of the total SCE APE. Mitigation is included requiring USACE to conduct an intensive pedestrian survey of the un-surveyed areas of the APE prior to construction. Mitigation is also included requiring USACE to develop a Cultural Resource Management Plan (CRMP) that would describe cultural resource requirements as they pertain to unanticipated discoveries, defining work stoppage, field methods, timelines, resource management and treatment, monitoring plans, data reporting, and tribal engagement. A mitigation measure will be imposed requiring USACE to properly treat human remains, if they are discovered as a result of construction activities.

The implementation of these mitigation measures would reduce impacts to less-than-significant levels pertaining to unidentified unique archaeological resources and historical resources. Therefore, no impacts to potential CRHR-eligible archaeological resources are anticipated during construction of SCE's Proposed Project components, and construction would not cause a substantial adverse change to archaeological resources after the Project is complete. As a result, ***less than significant impacts*** to archaeological resources are anticipated.

Impact 3.5-2: *Disturb any human remains, including those interred outside of formal cemeteries?*

Less Than Significant with Mitigation Incorporation. Based on the cultural resource evaluations and tribal consultations that have occurred associated with the proposed Project, no known human remains existing within the Project APE. However, California Health and Safety Code Section 7050.5, CEQA Section 15064.5, and Public Resources Code Section 5097.98 mandate the process to be followed in the event of an accidental discovery of any human remains in a location other than a dedicated cemetery. Specifically, California Health and Safety Code Section 7050.5 requires that in the event that human remains are discovered within a project site, disturbance of the site shall remain halted until the coroner has conducted an investigation into the circumstances, manner and cause of any death, and the recommendations concerning the treatment and disposition of the human remains have been made to the person responsible for the excavation, or to his or her authorized representative, in the manner provided in Section 5097.98 of the Public Resources Code. If the coroner determines that the remains are not subject to his or her authority and if the coroner recognizes or has reason to believe the human remains

to be those of a Native American, he or she shall contact, by telephone within 24 hours, the Native American Heritage Commission. Although soil-disturbing activities associated with development in accordance with the proposed Project could result in the discovery of human remains, compliance with existing law would ensure that impacts to human remains would not be significant.

SCE Project Components

Based on the intensive pedestrian survey conducted by AECOM, no interred human remains or cemeteries are located or anticipated to be located within the footprint of the transmission line or in the immediate Project vicinity. As such, construction of SCE's Proposed Project is not expected to result in the disturbance of human remains. In the unlikely event that human remains are encountered during ground-disturbing activities, mitigation has been included to ensure that potential impacts are ***less than significant.***

Impact 3.5-3: *Would the project directly or indirectly destroy a unique paleontological resource or site or unique geological feature?*

Less Than Significant. The intrusive igneous rocks that are mapped within the proposed Project APE are typically considered to have a very low to no potential fossil yield category, due to the lack of fossil preservation, and the metasedimentary rocks are typically considered low to no potential for fossil preservation, depending on the sediment type, fossil content, and level (grade) of metamorphism. As such, no fossils are expected within the proposed Project, and no unique paleontological resource, site, or unique geological features are expected that would be directly or indirectly impacted by the proposed Project. Impacts are ***less than significant.***

Mitigation Measures:

The mitigation measures listed below are assigned to either the Lead Agency or SCE. The Lead Agency will be responsible for implementation and compliance with the measures listed under "New Mitigation Measures proposed by Lead Agency" and SCE will be responsible for implementation and compliance with the measures listed under "New Mitigation Measures proposed by SCE (Utility Modifications)".

1999 FEIS/FEIR: Other than the requirement for on-going consultation SHPO and the Native American Heritage Commission, the 1999 FEIR/FEIR did not include mitigation measures.

New Mitigation Measures proposed by Lead Agency:

CUL-1 Compliance with the Programmatic Agreement to govern the Section 106 process throughout Project construction activities.

New Mitigation Measures proposed by SCE (Utility Modifications):

SCE CUL-1 **Document and Record Vincent 220-kV Transmission Line**. SCE shall document the entire Vincent 220-kV Transmission Line on National Park Service, Historic American Engineering Record Level II and Department of Parks and Recreation 523 forms prior to their removal.

SCE CUL-2 **Conduct Cultural Resources Survey**—SCE shall perform surveys prior to construction for any Project areas not yet surveyed (e.g. new or modified staging areas, pull sites, or other work areas). Resources discovered during surveys would be subject to all stipulations in the Cultural Resources Management Plan (CRMP).

SCE CUL-3 **Develop Cultural Resource Management Plan (CRMP)**—SCE shall prepare and submit for approval a CRMP to guide all cultural resource management activities during Project construction. Management of cultural resources shall follow all applicable federal and state standards and guidelines for the management of historic properties/historic resources. The CRMP shall be submitted to the federal and state agencies for review at least 30 days prior to the start of construction. The CRMP shall include, but not be limited to, the following sections:

- **Cultural Resources Protection Plan:** The CRMP shall define and map all known NRHP- and CRHR eligible or listed properties in or within 100 feet of the proposed Project APE/API. The CRMP will detail how NRHP- and CRHR-eligible or listed properties will be avoided and protected during construction. Measures shall include, at a minimum, designation and marking of Environmentally Sensitive Areas, archaeological monitoring, personnel training, and effectiveness reporting. The CRMP shall also detail: what measures will be used, where and when they will be implemented, and how avoidance measures and enforcement of Environmentally Sensitive Areas will be coordinated with construction personnel.

- **Cultural Resource Monitoring and Field Reporting:** Detail procedures for archaeological and Native American monitoring, as appropriate, reporting matrix, and when monitoring is no longer necessary. Include guidelines for monitoring in Areas of High Sensitivity for the discovery of buried NRHP and/or CRHR-eligible cultural resources, including burials, cremations, or sacred sites.

- **Unanticipated Discovery Protocol:** Detail procedures for halting construction, defining work stoppage zones, notifying stakeholders (e.g., agencies, Native Americans, utilities), and assessing NRHP and/or CRHR eligibility in the event that unanticipated discoveries are encountered during construction. Include methods, timelines for assessing NRHP and/or CRHR eligibility, formulating mitigation plans, and implementing treatment. Mitigation and treatment plans for unanticipated discoveries shall be reviewed by appropriate Native American tribes and approved by the federal and state agencies, prior to implementation.

- **Data Analysis and Reporting:** Detail methods for data analysis in a regional context, reporting of results within one year of completion of field studies, curation of artifacts and data (maps, field notes, archival materials, recordings, reports, photographs, and analysts' data) at a facility that is approved by federal and state agencies, and dissemination of reports to appropriate repositories.

SCE CUL-4 **Properly Treat Human Remains**—SCE shall follow all federal and state laws, statutes, and regulations that govern the treatment of human remains. All work in the vicinity of the find will cease within a 100-foot radius of the remains, the area will be protected to ensure that no additional disturbance occurs. Should inadvertent effects to or unanticipated discoveries of human remains be made on federal lands, the federal agency and County Coroner (California Health and Safety Code 7050.5(b)) shall be notified immediately. If the remains are determined to be Native American or if Native American cultural items pursuant to the Native American Graves Protection and Repatriation Act (NAGPRA) are uncovered, the remains shall be treated in accordance with the provisions of NAGPRA (43 CFR 10) and the Archaeological Resources Protection Act (43 CFR 7). If the remains are not on federal land, the [state agency/ies] shall be notified immediately, and the remains shall be treated in accordance with Health and

Safety Code Section 7050.5, CEQA Section 15064.5(e), and Public Resources Code Section 5097.98. SCE shall assist and support the [federal and/or state agency/ies], as appropriate, in all required NAGPRA and Section 106 actions, government to-government and consultations with Native Americans, agencies, and consulting parties as requested by the federal and state agencies. SCE shall comply with and implement all required actions and studies that result from such consultations.

Cumulative Impacts:

The scope for considering cumulative impacts to cultural resources are the geographic areas covered by the Tulare County General Plan / EIR and the City of Porterville General Plan / EIR. Mitigation measures associated with this topic are included to ensure that potential impacts to cultural resources remains less than significant. As the Project does not result in adverse impacts to cultural resources, cumulative impacts are considered ***less than cumulatively considerable***.

3.6 Energy

This section of the SEIR evaluates the potential impacts to Energy Resources associated with implementation of the proposed Project. No NOP comments were received pertaining to Energy Resources.

Determination of Adequacy of 1999 FEIS/FEIR

The proposed Project footprint and area of potential effect (APE), as well as the proposed new maximum gross pool elevation raise has not changed since evaluation in the 1999 FEIS/FEIR. However, the CEQA Guidelines have been updated to include questions related to impacts to energy resources. Therefore, the following determinations are made:

Topic	Further Analysis Required?	1999 FEIS/FEIR Analysis Sufficient?
a. Would the project result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	✓	
b. Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	✓	

Discussion:

Because impacts to energy resources was not evaluated in the 1999 FEIS/FEIR, this SEIR evaluates potential Project-related impacts to Energy resources.

Environmental Setting

Electricity

Electricity, a consumptive utility, is a man-made resource. The production of electricity requires the consumption or conversion of energy resources, including water, wind, oil, gas, coal, solar, geothermal, and nuclear resources, into energy. The delivery of electricity involves a number of system components, including substations and transformers that lower transmission line power

(voltage) to a level appropriate for on-site distribution and use. The electricity generated is distributed through a network of transmission and distribution lines commonly called a power grid. Conveyance of electricity through transmission lines is typically responsive to market demands.

Southern California Edison provides electricity to southern Tulare County, including the proposed Project area, while the Southern California Gas Company provides natural gas to the majority of Tulare County, including the proposed Project area.

Energy Usage

Energy usage is typically quantified using the British Thermal Unit (BTU). Total energy usage in California was 7,830 trillion BTU's in 2016 (the most recent year for which this specific data is available), which equates to an average of 199 million BTU's per capita. Of California's total energy usage, the breakdown by sector is 39 percent transportation, 24 percent industrial, 19 percent commercial, and 18 percent residential. Electricity and natural gas in California are generally consumed by stationary users such as residences and commercial/ industrial facilities, whereas petroleum consumption is generally accounted for by transportation-related energy use.[1] In 2017, taxable gasoline sales (including aviation gasoline) in California accounted for 15,540,154,774 gallons of gasoline.[2]

The electricity consumption attributable to Tulare County from 2008 to 2018 is provided in Table 3.6-1, Electricity Consumption in Tulare County 2008-2018 As indicated in Table 3.6-1, energy consumption in Tulare County varied approximately 20 percent over the last ten years.

Table 3.6-1
Electricity Consumption in Tulare County 2008 – 2018[3]

Year	kWh consumed
2008	3922.31
2009	3979.25
2010	3815.88

[1] U.S. Energy Information Administration, California State Profile and Energy Estimates. https://www.eia.gov/state/print.php?sid=CA. Accessed July 2020.
[2] California Department of Tax and Fee Administration, Fuel Taxes Statistics and Report: Net Taxable Gasoline Gallons. http://www.cdtfa.ca.gov/taxes-and-fees/MVF-10-Year-Report.pdf. Accessed July 2020.
[3] California Energy Commission. Energy Reports. Electricity Consumption by County. https://ecdms.energy.ca.gov/elecbycounty.aspx. Accessed July 2020.

2011	3744.85
2012	4159.79
2013	4313.91
2014	4490.53
2015	4482.94
2016	4373.44
2017	4306.27
2018	4512.91

Natural Gas

Natural gas is a combustible mixture of simple hydrocarbon compounds (primarily methane) that is used as a fuel source. Nature gas consumed in California is obtained from naturally occurring reservoirs, mainly located outside the State, and delivered through high-pressure transmission pipelines. The natural gas transportation system is a nationwide network, and, therefore, resource availability is typically not an issue. Natural gas provides almost one-third of the state's total energy requirements and is used in electricity generation, space heating, cooking, water heating, industrial processes, and as a transportation fuel.

The natural gas consumption attributable to Tulare County from 2008 to 2018 is provided in Table 3.6-2, Natural Gas Consumption in Tulare County 2008-2018. Natural gas consumption in Tulare County varied up to 9 percent between 2008 and 2018.

Table 3.6-2
Natural Gas Consumption in Tulare County 2008 – 2018[4]

Year	Millions of Therms consumed
2008	146.48
2009	150.01

[4] California Energy Commission. Energy Reports. Gas Consumption by County. http://www.ecdms.energy.ca.gov/gasbycounty.aspx Accessed June 2019.

Year	Millions of Therms consumed
2010	156.29
2011	159.45
2012	157.72
2013	157.85
2014	151.21
2015	149.52
2016	151.44
2017	150.43
2018	157.29

Transportation Energy

According to the CEC, transportation accounts for nearly 37 percent of California's total energy consumption in 2014.[5] In 2018, California consumed 15.5 billion gallons of gasoline and 3.1 billion gallons of diesel fuel.[6] Petroleum-based fuels currently account for 90% of California's transportation energy sources[7]; however, the state is now working on developing flexible strategies to reduce petroleum use. Accordingly, gasoline consumption in California has declined.

According to the Board of Equalization (BOE), statewide taxable sales figures indicate a total of 15,584 million gallons of gasoline and 3,124 million gallons of diesel fuel were sold in 2017.[8]

[5] California Energy Commission. 2016 Integrated Energy Policy Report Update. Docket #16-IEPR-01. Page 4. https://www.energy.ca.gov/2016_energypolicy/. Accessed July 2020.
[6] California Department of Tax and Fee Administration. January 2019 – Motor Vehicle Fuel 10 Year Reports and Taxable Diesel Gallons 10 Year Report. https://www.cdtfa.ca.gov/taxes-and-fees/spftrpts.htm. Accessed July 2020.
[7] California Energy Commission. Draft Staff Report. 2017-2018 Investment Plan Update for the Alternative and Renewable Fuel and Vehicle Technology Program. Page 7. https://www.energy.ca.gov/2016publications/CEC-600-2016-007/CEC-600-2016-007-SD.pdf. Accessed July 2020.
[8] California Energy Commission. California Retail Fuel Outlet Annual Reporting (CEC-A15) Results. https://www.energy.ca.gov/almanac/transportation_data/gasoline/piira_retail_survey.html. Accessed July 2020.

Regulatory Setting

Federal Energy Policy and Conservation Act

In 1975, Congress enacted the Energy and Policy Conservation Act, which established the first fuel economy standards for on-road motor vehicles in the United States. Pursuant to the act, the National Highway Traffic Safety Administration (NHTSA) is responsible for establishing additional vehicle standards.

Corporate Average Fuel Economy (CAFE) Program

The Corporate Average Fuel Economy (CAFE) Program was enacted by Congress in 1975. The purpose of the program is to reduce the consumption of energy by increasing the fuel economy of cars and light trucks.

Energy Policy Act of 2005

This Act addresses energy efficiency; renewable energy requirements; oil, natural gas and coal; alternative-fuel use; tribal energy, nuclear security; vehicles and vehicle fuels, hydropower and geothermal energy, and climate change technology. The Act provides revised annual energy reduction goals (two percent per year beginning in 2006), revised renewable energy purchase goals, federal procurement of Energy Star of Federal Energy Management program-designated products, federal green building standards, and fuel cell vehicle and hydrogen energy system research/demonstration.

Energy Independence and Security Act of 2007

This Act set increased CAFE standards for motor vehicles and includes the following provisions related to energy efficiency:

- Renewable fuel standards (RFS)
- Appliance and lighting efficiency standards
- Building energy efficiency

This Act requires increasing levels of renewable fuels to replace petroleum. The U.S. EPA is responsible for developing and implementing regulations to ensure transportation fuel sold into the US contains a minimum volume of renewable fuel.

The RFS programs regulations were developed in collaboration with refiners, renewable fuel products, and other stakeholders and were created under the Energy Policy Act of 2005. The RFS program established the first renewable fuel volume mandate in the US. As required under the

act, the original RFS program required 7.5 billion gallons of renewable fuel to be blended into gasoline by 2012. Under the Act, the RFS program was expanded in several key ways that laid the foundation for achieving significant reductions of greenhouse gas (GHG) emissions through the use of renewable fuels, for reducing imported petroleum, and for encouraging the development and expansion of the nation's renewable fuels sector. The updated program is referred to as RFS2 and includes the following:

- EISA expanded the RFS program to include diesel, in addition to gasoline:
- EISA increase the volume of renewable fuel required to be blended into transportation fuel from 9 billion gallons in 2008 to 36 billion gallons by 2022;
- EISA established new categories of renewable fuel and set separate volume requirements for each one; and
- EISA required by the U.S. EPA to apply lifecycle GHG performance threshold standards to ensure that each category of renewable fuel emits fewer GHGs than the petroleum fuel it replaces.[9]

Additional provisions of the EISA address energy savings in government and public institutions, promoting research for alternate energy, additional research in carbon capture, international energy programs, and the creation of "green jobs."

Federal Vehicle Standards

In 2009, the NHTSA issued a final rule regulating fuel efficiency and GHG emissions from cars and light-duty trucks for model year 2011; and, in 2010, the EPA and NHTSA issued a final rule regulating cars and light-duty trucks for model years 2012–2016.

In 2010, President Obama issued a memorandum directing the Department of Transportation, Department of Energy, EPA, and NHTSA to establish additional standards regarding fuel efficiency and GHG reduction, clean fuels, and advanced vehicle infrastructure. In response to this directive, EPA and NHTSA proposed stringent, coordinated federal GHG and fuel economy standards for model years 2017–2025 light-duty vehicles. The proposed standards projected to achieve 163 grams per mile of carbon dioxide (CO2) in model year 2025, on an average industry fleetwide basis, which is equivalent to 54.5 miles per gallon if this level were achieved solely through fuel efficiency. The final rule was adopted in 2012 for model years 2017–2021, and NHTSA intends to set standards for model years 2022–2025 in a future rulemaking.

[9] U.S. EPA. Renewable Fuel Standard Program. Overview for Renewable Fuel Standard. https://www.epa.gov/renewable-fuel-standard-program/overview-renewable-fuel-standard. Accessed July 2020.

In addition to the regulations applicable to cars and light-duty trucks described above, in 2011, the EPA and NHTSA announced fuel economy and GHG standards for medium- and heavy-duty trucks for model years 2014 – 2018. The standards for CO2 emissions and fuel consumption are tailored to three main vehicle categories: combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles. According to the EPA, this regulatory program will reduce GHG emissions and fuel consumption for the affected vehicles by 6 to 23 percent over the 2010 baselines.

In August 2016, the EPA and NHTSA announced the adoption of the phase two program related to the fuel economy and GHG standards for medium- and heavy-duty trucks. The phase two program will apply to vehicles with model year 2018-2027 for certain trailers, and model years 2021-2027 for semi-trucks, large pickup trucks, vans, and all types and sizes of buses and work trucks. The final standards are expected to lower CO2 emissions by approximately 1.1 billion MT and reduce oil consumption by up to 2 billion barrels over the lifetime of the vehicles sold under the program.[10]

In August 2018, The USEPA and NHTSA released a notice of proposed rulemaking called Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks (SAFE Vehicles Rule). This rule would modify the existing CAFE standards and tailpipe carbon dioxide emissions standards for passenger cars and light trucks, and establish new standards covering model years 2021-2026. SAFE standards are expected to uphold model year 2020 standards through 2026.[11]

State of California

Integrated Energy Policy Report

Senate Bill 138 (Bowen Chapter 568, Statues of 2002) requires the California Energy Commission to prepare a biennial integrated energy policy report that assesses major energy trends and issues facing the state's electricity, natural gas, and transportation fuel sectors and provides policy recommendations to conserve resources; protect the environment; ensure reliable, secure, and diverse energy supplies; enhance the state's economy; and protect public and safety (Public Resources Code §25301(a)).

[10] U.S. Department of Transportation. Briefing Room. EPA and DOT Finalize Greenhouse Gas and Fuel Efficiency Standards for Heavy-Duty Trucks. https://www.transportation.gov/briefing-room/epa-and-dot-finalize-greenhouse-gas-and-fuel-efficiency-standards-heavy-duty-trucks. Accessed July 2020.
[11] U.S. Department of Transportation. SAFE. The Safer Affordable Fuel-Efficient 'SAFE' Vehicles Rule. https://www.nhtsa.gov/corporate-average-fuel-economy/safe. Accessed July 2020.

The 2016 Integrated Energy Policy Report[12] (IEPR) was published in February 2016, and continues to work towards improving electricity, natural gas, and transportation fuel energy use in California. The 2016 IEPR focuses on a variety of topics such as including the environmental performance of the electricity generation system, landscape-scale planning, transportation fuel supply reliability issues, and the California Energy Demand Forecast.

State of California Energy Action Plan

The CEC initially adopted the Energy Action Plan in 2003, which identified emerging trends related to energy supply, demand, conservation, public health and safety, and the maintenance of a healthy economy. The CEC's goal for the Energy Action Plan is to ensure that adequate, reliable, and reasonably-priced electrical power and natural gas supplies, including prudent reserves, are achieved and provided through policies, strategies, and actions that are cost-effective and environmentally sound for California's consumers and taxpayers. The plan called for the state to assist in the transformation of the transportation system to improve air quality, reduce congestion, and increase the efficient use of fuel supplies with the least environmental and energy costs. To further this policy, the plan identified a number of strategies, including assistance to public agencies and fleet operators and encouragement of urban designs that reduce vehicle miles traveled and accommodate pedestrian and bicycle access.

Integrated Energy Policy Report

In 2002, Senate Bill 1389 was passed that requires the CEC to prepare the Integrate Energy Policy Report that assesses major energy trends and issues facing the state's electricity, natural gas, and transportation fuel sectors and provides policy recommendations to conserve resources, protect the environment, ensure reliable, secure, and diverse energy supplies. The report is required to be prepared every two years. Information from the Energy Action Plan was incorporated into this policy report and the Energy Action Plan was no longer updated.

California's Energy Efficiency Standards for Residential and Nonresidential Buildings (Title 24)

Residential and Nonresidential Buildings in 1978 in response to a legislative mandate to reduce energy consumption in California. Although not originally intended to reduce GHG emissions, increased energy efficiency and reduced consumption of electricity, natural gas, and other fuels would result in fewer GHG emissions from residential and nonresidential buildings subject to

[12] California Energy Commission. 2016 Integrated Energy Policy Report Update. https://www.energy.ca.gov/2016_energypolicy/. Accessed July 2020.

the standard. The standards are updated periodically to allow for the consideration and inclusion of new energy efficiency technologies and methods.

Part 11 of the Title 24 Building Standards Code is referred to as the California Green Building Standards Code (CALGreen Code). The purpose of the CALGreen Code is to "improve public health, safety and general welfare by enhancing the design and construction of buildings through the use of building concepts having a positive environmental impact and encouraging sustainable construction practices in the following categories: (1) planning and design; (2) energy efficiency; (3) water efficiency and conservation; (4) material conservation and resource efficiency; and (5) environmental air quality." The CALGreen Code is not intended to substitute or be identified as meeting the certification requirements of any green building program that is not established and adopted by the California Building Standards Commission (CBSC).

CALGreen contains both mandatory and voluntary measures. For nonresidential land uses, there are 39 mandatory measures including, but not limited to, exterior light pollution reduction, wastewater reduction by 20 percent, and commissioning of projects over 10,000 square feet. Two tiers of voluntary measures apply to nonresidential land uses, for a total of 36 additional elective measures.

California's Building Energy Efficiency Standards are updated on an approximately three-year cycle. Starting in 2020, the 2019 standards will improve upon existing standards, focusing on three key areas: proposing new requirements for installation of solar photovoltaics for newly constructed low-rise residential buildings; updating current ventilation and Indoor Air Quality (IAQ) requirements; and extending Title 24 Part 6 to apply to healthcare facilities. The 2019 Building Energy Efficiency Standards are approximately 53 percent more efficient than the 2016 Title 24 Energy Standards for residential development and approximately 30 percent more efficient for nonresidential development.

Executive Order B-30-15

Executive Order B-30-15, 2030 Carbon Target and Adaptation, issued by Governor Brown in April 2015, set a target of reducing GHG emissions by 40 percent below 1990 levels in 2030. To achieve this ambitious target, Governor Brown identified five key goals for reducing GHG emissions in California through 2030:

- Increase the amount of renewable electricity provided state-wide to 50 percent;
- Double energy efficiency savings achieved in existing buildings and make heating fuels cleaner;
- Reduce petroleum use in cars and trucks by up to 50 percent;

- Reduce emissions of short-lived climate pollutants; and
- Manage farms, rangelands, forests, and wetlands to increasingly store carbon.

Senate Bill (SB) 375 (Sustainable Communities and Climate Protection Act)

In January 2009, California SB 375, known as the Sustainable Communities and Climate Protection Act, went into effect. The objective of SB 375 is to better integrate regional planning of transportation, land use, and housing to reduce sprawl and ultimately reduce GHG emissions and other air pollutants. SB 375 tasks CARB to set GHG reduction targets for each of California's 18 regional Metropolitan Planning Organizations (MPOs). Each MPO is required to prepare a Sustainable Communities Strategy (SCS) as part of their Regional Transportation Plan (RTP). The SCS is a growth strategy in combination with transportation policies that will show how the MPO will meet its GHG reduction target. If the SCS cannot meet the reduction goal, an Alternative Planning Strategy may be adopted that meets the goal through alternative development, infrastructure, and transportation measures or policies.

In 2010, CARB released the proposed GHG reduction targets for the MPOs. The proposed reduction targets for the Fresno COG region were five percent by year 2020 and ten percent by year 2035 through September of 2018, then six percent by 2020 and 13 percent by 2035 beginning in October of 2018.[13]

Renewables Portfolio Standard Program

In 2002, California established its Renewables Portfolio Standard (RPS) Program, with the goal of increasing the percentage of renewable energy in the state's electricity mix to 20 percent of retail sales by 2017. The 2003 Integrated Energy Policy Report recommended accelerating that goal to 20 percent by 2010, and the 2004 Energy Report Update further recommended increasing the target to 33 percent by 2020. The state's Energy Action Plan also supported this goal. In 2006 under Senate Bill 107, California's 20 percent by 2010 RPS goal was codified. The legislation required retail sellers of electricity to increase renewable energy purchases by at least one percent each year with a target of 20 percent renewables by 2010. Publicly owned utilities set their own RPS goals, recognizing the intent of the legislature to attain the 20 percent by 2010 target.

In 2008, Governor Schwarzenegger signed Executive Order S-14-08 requiring that "all retail sellers of electricity shall serve 33 percent of their load with renewable energy by 2020." The

[13] California Air Resources Board. Regional Plan Targets. https://ww2.arb.ca.gov/our-work/programs/sustainable-communities-program/regional-plan-targets. Accessed July 2020.

following year, Executive Order S-21-09 directed CARB to enact regulations to achieve the goal of 33 percent renewables by 2020.

In 2015, Governor Brown signed Senate Bill 350 to codify ambitious climate and clean energy goals. One key provision of SB 350 is for retail sellers and publicly owned utilities to procure "half of the state's electricity from renewable sources by 2030."

The State's RPS program was further strengthened by SB 100 in 2018. SB 100 revised the State's RPS Program to require retail sellers of electricity to serve 50 percent and 60 percent of the total kilowatt-hours sold to retail end-use customers be served by renewable energy sources by 2026 and 2030, respectively, and to require that 100 percent of all electricity supplied come from renewable sources by 2045.

Executive Order B-55-18

In 2018, Governor Brown signed EO B-55-18 to achieve carbon neutrality by moving California to 100 percent clan energy by 2045. This Executive Order also includes specific measures to reduce GHG emissions via clean transportation, energy efficient buildings, directing cap-and-trade funds to disadvantaged communities, and better management of the state's forest land.

Low Carbon Fuel Standard Regulation

CARB initially approved the Low Carbon Fuel Standard (LCFS) regulation in 2009, identifying it as one of the nine discrete early action measures in the 2008 Scoping Plan to reduce California's GHG emissions. The LCFS regulation defines a carbon intensity, or "CI," reduction target (or standard) for each year, which the rule refers to as the "compliance schedule." The LCFS regulation requires a reduction of at least 10 percent in the CI of California's transportation fuels by 2020 and maintains that target for all subsequent years.

CARB has begun the rulemaking process for strengthening the compliance target of the LCFS through the year 2030. For a new LCFS target, the preferred scenario in the 2017 Scoping Plan Update identifies an 18 percent reduction in average transportation fuel carbon intensity, compared to a 2010 baseline, by 2030 as one of the primary measures for achieving the state's GHG 2030 target. Achieving the SB 32 reduction goals will require the use of a low carbon

transportation fuels portfolio beyond the amount expected to result from the current compliance schedule.[14]

Advanced Clean Cars Program

In 2012, CARB approved the Advanced Clean Cars (ACC) Program (formerly known as Pavley II) for model years 2017-2025. The components of the ACC program are the Low-Emission Vehicle (LEV) regulations and the Zero-Emission Vehicle (ZEV) regulation. The program combines the control of smog, soot, and global warming gases with requirements for greater numbers of zero-emission vehicles into a single package of standards. By 2025, new automobiles under California's Advanced Clean Car program will emit 34 percent less global warming gases and 75 percent less smog-forming emissions.

EO B-48-18, issued by Governor Brown in 2018, establishes a target to have five million ZEVs on the road in California by 2030. This Executive Order is supported by the State's 2018 ZEV Action Plan Priorities Update, which expands upon the State's 2016 ZEV Action Plan. While the 2016 plan remains in effect, the 2018 update function as an addendum, highlighting the most important actions State agencies are taking in 2018 to implement the directives of EO B-48-18.

Thresholds of Significance

Consistent with Appendix G of the CEQA Guidelines, the proposed Project will have a significant impact related to energy if it will:

- Result in potentially significant environmental impact due to a wasteful, inefficient or unnecessarily consumption of energy resources during project construction or operation;
- Conflict with or obstruct a state or local plan for renewable energy or energy efficiency

Impacts and Mitigation Measures

Impact 3.6-1: *Would the project result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?*

Less Than Significant. The proposed Project includes modifying the existing spillway by constructing a concrete ogee weir which will increase the gross pool elevation by ten feet, which will in turn increase the existing water storage capacity and increase the reservoir surface area.

[14] California Air Resources Board. CARB amends Low Carbon Fuel Standard for wider impact. https://ww2.arb.ca.gov/index.php/news/carb-amends-low-carbon-fuel-standard-wider-impact. Accessed July 2020.

In addition to reinforcing the Highway 190 bridge abutments and Frazier Dike, the increased pool elevation will require structures and supporting utilities at both the Rocky Hill and Tule Recreation Areas to be relocated or flood protected. Relocated or modified structures include restroom facilities, parking areas, boat ramps, pumphouse facilities, a storage tank, well, and metal shed.

Also included in the Project is SCE's removal and replacement of approximately 2.3 miles of existing 220-kilovolt transmission line facilities (and associated transmission towers), primarily within an existing 200-foot ROW, use of nearby staging yards and adjacent access roads, and the removal and/or replacement of existing distribution facilities within the highest lake level rise elevation.

Electricity

Construction

Temporary electric power would be required at various construction sites throughout the Project area. Electricity would be consumed by lighting and electronic equipment located in trailers used by construction crews, and by small, off-road equipment used during construction activities. However, the electricity used for such activities would be temporary and would have a negligible contribution to the overall energy consumption in the Project area.

Operational

Once constructed, the proposed Project would require minimal amounts of electricity. The Project consists of modification and/or replacement of existing structures and facilities. No new structures are associated with the proposed Project; however, the expanded parking lots may require additional lighting. Additional lighting is subject to Title 24 energy regulations, which will ensure that the lighting utilized is efficient. As such, the electricity energy that would be consumed by the Project is not considered unnecessary, inefficient, or wasteful.

Natural Gas

Construction

Substantial natural gas consumption is not anticipated to occur during construction activities that could occur with Project implementation. Fuels used for construction would generally consist of diesel and gasoline, which are discussed in the next section "Diesel and Gasoline Fuel". Potential natural gas use during construction activities would not be unnecessary, inefficient, or wasteful.

Operational

The Project consists of modification and/or replacement of existing structures and facilities. No new structures are associated with the proposed Project and as such, Project implementation would not increase the need for natural gas energy. Therefore, the natural gas energy that would be consumed by the Project is not considered unnecessary, inefficient, or wasteful.

Diesel and Gasoline Fuel

Construction

Diesel and gasoline fuels, also referred to as petroleum, would be consumed during construction activities. Fuel use by construction equipment would be the primary energy resource consumed during construction activities, and VMT associated with the transportation of construction materials (e.g., deliveries) and worker trips would also result in petroleum consumption. Whereas on-site, heavy-duty construction equipment and delivery trucks would predominantly use diesel fuels, construction workers would generally rely on gasoline-powered vehicles to travel to and from construction sites. State regulations such as LCFS would reduce the carbon intensity of transportation-related fuels, and all construction projects would be required to comply with CARB's Airborne Toxic Control Measures, which, for example, restrict heavy-duty diesel vehicle idling to five minutes. Since petroleum use during construction would be temporary at each location, necessary for construction activities, and subject to mandatory regulations described above, it would not be unnecessary, wasteful or inefficient.

Operational

Vehicle fuel consumption associated with Project operation would continue to occur as vehicles travel to the lake for recreational purposes; however, the purpose of the Project is to increase the storage capacity of the lake to decrease downstream flooding. With the exception of facilities that will be relocated or increased in size due to the raised water level, no new facilities would be constructed that would create an increase in vehicular traffic. Additionally, existing fuel consumption would generally decrease as vehicle fuel efficiency increases to meet State GHG reduction goals.

Numerous regulations are in place that require and encourage fuel efficiency. For example, CARB has adopted an approach to passenger vehicles by combining the control of smog-causing pollutants and GHG emissions into a single, coordinated package of standards. The approach also includes efforts to support and accelerate the number of plug-in hybrids and ZEVs in California. In addition, per the requirements identified in SB 375, CARB adopted a regional goal

to reduce GHG's by 35 percent by 2045. Compliance with the above-noted policies and mandatory federal and state regulations will reduce potential unnecessary, inefficient, or wasteful uses of energy resources would ensure that impacts relating to energy remain ***less than significant.***

Impact 3.6-2: *Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?*

Less Than Significant. Title 24, California's Energy Efficiency Standards for Residential and Non-residential Buildings, was established by the CEC in 1978 in response to a legislative mandate to create uniform building codes to reduce California's energy consumption and provide energy efficiency standards for residential and non-residential buildings through the State. In 2019, the CEC updated Title 24 standards with more stringent requirements. The 2019 Standards were incorporated within the California Building Code and are expected to substantially reduce the growth in electricity and natural gas use. Additional savings result from the application of the Standards on building alterations. For example, requirements for cool roofs, lighting, and air distribution ducts are expected to save additional electricity. These savings are cumulative, doubling as years go by. Additionally, starting in 2020, all new homes constructed in California are required to include solar panels, per the CEC's 2019 Building Energy Efficiency Standards.[15]

As described in Impact 3.6-1, the increased pool elevation will require structures and supporting utilities at both the Rocky Hill and Tule Recreation Areas to be relocated or flood protected. No additional occupiable structures will be constructed as a part of the Project. Any impacts related to conflicting or obstructing a state or local plan for renewable energy or energy efficiency would be ***less than significant.***

Mitigation Measures:

1999 FEIS/FEIR: This topic was not included in the 1999 FEIS/FEIR. As such, no mitigation measures pertaining to this topic were identified.

[15] California Energy Commission, Energy Commission Adopts Standards Requiring Solar Systems for New Homes, First in Nation, May 9, 2018. https://www.energy.ca.gov/releases/2018_releases/2018-05-09_building_standards_adopted_nr.html. Accessed July 2020.

New Mitigation Measures proposed by Lead Agency: No new or additional mitigation measures are necessary.

New Mitigation Measures proposed by SCE (Utility Modifications): No new or additional mitigation measures are necessary.

Cumulative Impacts:

Less Than Cumulatively Considerable. The scope for considering cumulative impacts to energy are the geographic areas covered by the Tulare County General Plan / EIR and Porterville General Plan / EIR as well as all of the San Joaquin Valley. Proposed Project implementation would require the consumption of electricity, natural gas, and vehicle fuel resources during construction. As discussed above, new construction would be required to comply with statewide mandatory energy requirements outlined in Title 24, Part 6, of the California Code of Regulations (the CALGreen Code), which could decrease estimated electricity and natural gas consumption in new and retrofitted structures. Furthermore, energy consumed by development would continue to be subject to the regulations described in the Regulatory Setting of this Section. For these reasons, the electrical and natural gas energy that would be consumed by the Project is not considered unnecessary, inefficient, or wasteful. Impacts are ***less than cumulatively considerable***.

3.7 Geology/Soils

This section of the SEIR identifies potential impacts of implementing the proposed Project on geology and soils. No NOP comment letters were received pertaining to this topic.

Determination of Adequacy of 1999 FEIS/FEIR

The proposed Project footprint and area of potential effect (APE), as well as the proposed new maximum gross pool elevation raise has not changed since evaluation in the 1999 FEIS/FEIR. The 1999 FEIS/FEIR did not identify any significant impacts associated with geology or soils. Therefore, the following determinations are made:

Topic	Further Analysis Required?	1999 FEIS/FEIR Analysis Sufficient?
a-i. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42. a-ii. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking? a-iii. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction? a-iv. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving landslides?		✓

b. Result in substantial soil erosion or the loss of topsoil?		✓
c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?		✓
d. Be located on expansive soil, as defined in Table 18-1-B of the most recently adopted Uniform Building Code creating substantial risks to life or property?		✓

Discussion:

Although the 1999 FEIS/FEIR did not identify any significant impacts regarding geology or soils, the Project is subject to current seismic regulations and design standards. The Project would be engineered and constructed in strict accordance with the earthquake resistant design requirements contained in the latest edition of the California Building Code (CBC) for seismic zone III, as well as Title 24 of the California Administrative Code, and therefore would avoid potential seismically induced hazards on planned facilities.

Soils in the region are residual soils, which were formed by weathering of the bedrock complex and terrace deposits, and slopewash where movement of the residual soils by gravity has occurred. As required by the Clean Water Act (CWA) and the Central Valley Regional Water Quality Control Board (CVRWQCB), a Stormwater Pollution Prevention Plan (SWPPP) will be developed by a qualified engineer or erosion control specialist and implemented before construction begins. The SWPPP will be kept on site during construction-related activities and will be made available upon request to representatives of the CVRWQCB. The objectives of the SWPPP will be to identify pollutant sources that may affect the quality of stormwater associated with construction activity and to identify, construct, and implement stormwater pollution prevention measures to reduce pollutants in stormwater discharges during and after construction. To meet these objectives, the SWPPP will include a description of potential pollutants, a description of methods of management for dredged sediments, and hazardous materials present on site during construction (including vehicle and equipment fuels). The SWPPP will also include details for best management practices (BMPs) for the implementation of sediment and erosion control practices. Implementation of the SWPPP will comply with state and

federal water quality regulations and will ensure this impact remains at a less-than-significant level. Compliance with local grading and erosion control ordinances will also help minimize adverse effects associated with erosion and sedimentation. Any stockpiled soils will be watered and/or covered to prevent loss due to wind erosion as part of the SWPPP during construction and reclamation. As a result of these efforts, loss of topsoil and substantial soil erosion during the construction and reclamation periods are not anticipated. Therefore, the following determinations are made:

CEQA Guidelines Section 15162(a)(1-3)	YES	NO
1. Substantial changes are proposed in the project which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;		✓
2. Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.		✓
3. New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified shows any of the following: a. The project will have one or more significant effects not discussed in the previous EIR; b. Significant effects previously examined will be substantially more severe than shown in the previous EIR; c. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to		✓

adopt the mitigation measure or alternative; or d. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.		

Mitigation Measures:

1999 FEIS/FEIR: No mitigation measures pertaining to this topic were identified.

New Mitigation Measures proposed by Lead Agency: No new or additional mitigation measures are necessary.

New Mitigation Measures proposed by SCE (Utility Modifications): No new or additional mitigation measures are necessary.

Cumulative Impacts:

The scope for considering cumulative impacts to geology and soils is generally site-specific rather than cumulative in nature because each project site has different geological considerations that would be subject to review. Construction of the individual development projects allowed in the area (but outside the Project area) may result in risks associated with geology and soils. For example, there will always be a chance that a fault located anywhere in the state (or region) could rupture and cause seismic ground shaking. Additionally, grading, excavation, removal of vegetation cover, and loading activities associated with construction activities could temporarily increase runoff, erosion, and sedimentation.

While some cumulative impacts may occur in the region as individual projects are constructed, State and federal regulations, as well as local policy documents such as the Tulare County General Plan / EIR and City of Porterville General Plan / EIR will reduce the risk to people in the region. Considering the protection granted by local, state, and federal agencies and their requirements for the seismic design, as discussed above, the overall cumulative impact would not be

significant. The proposed Project's incremental contribution to cumulative geologic and soil impacts would be ***less than cumulatively considerable***.

3.8 Greenhouse Gas Emissions

This section of the SEIR evaluates the potential impacts to Greenhouse Gas Emissions (GHGs) associated with implementation of the proposed Project. No NOP comments were received pertaining to Greenhouse Gas Emissions.

Determination of Adequacy of 1999 FEIS/FEIR

The proposed Project footprint and area of potential effect (APE) has not changed since evaluation in the 1999 FEIS/FEIR. However, the CEQA Guidelines have been updated to include questions related to impacts to greenhouse gas emission. Therefore, the following determinations are made:

Topic	Further Analysis Required?	1999 FEIS/FEIR Analysis Sufficient?
a. Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	✓	
b. Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gasses?	✓	

Discussion:

The 1999 FEIS/FEIR did not address potential impacts to greenhouse gas (GHG) emissions because it was prepared prior to the 2010 amendment to the State CEQA Guidelines requiring the evaluation of environmental impacts related to GHG emissions. Therefore, this section provides a comprehensive analysis of GHG emissions associated with the proposed Project.

Environmental Setting

The United States Environmental Protection Agency (EPA) refers to climate change as, "…any significant change in the measures of climate lasting for an extended period of time. In other words, climate change includes major changes in temperature, precipitation, or wind patterns,

among other effects, that occur over several decades or longer."[1] The United Nations, Intergovernmental Panel on Climate Change (IPCC) refers to climate change as, "a change in the state of the climate that can be identified (e.g. using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. It refers to any change in climate over time, whether due to natural variability or because of human activity. This usage differs from that in the United Nations Framework Convention on Climate Change (UNFCCC), where climate change refers to a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods."[2]

The United Nations Intergovernmental Panel on Climate Change (IPCC) predicted that the global mean temperature change from 1990 to 2100 could range from 1.1 degrees Celsius (°C) to 6.4°C. Regardless of analytical methodology, global average temperatures and sea levels are expected to rise under all scenarios.[3] The report also concluded that "[w]arming of the climate system is unequivocal," and that "[m]ost of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations."

Greenhouse Gasses

Scientists have concluded that human activities are contributing to global climate change by adding large amounts of heat-trapping gases, known as GHG, to the atmosphere. Climate change is the variation of earth's climate over time, whether due to natural variability or as a result of human activities. The primary source of these GHG is fossil fuel use.

The six GHGs defined by Assembly Bill (AB) 32 (discussed further in the Regulatory Environment section) include carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6). The physical properties and common sources of these GHGs are described in Table 3.8-1. A seventh greenhouse gas, nitrogen trifluoride (NF3) was added to Health and Safety Code section 38505(g)(7) as a greenhouse gas of concern.[4] Other greenhouse gases include water vapor, ozone, and aerosols. Black carbon (BC)

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[1] U.S. Environmental Protection Agency. Climate Change: Basic Information. https://www.epa.gov/climatechange/climate-change-basic-information#Change. Accessed July 2020.
[2] United Nations, Intergovernmental Panel on Climate Change. 2007. *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Page 30. http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf. Accessed July 2020.
[3] United Nations, Intergovernmental Panel on Climate Change. 2001. *Climate Change 2001: The Scientific Basis*. Summary for Policymakers. http://www.grida.no/publications/other/ipcc_tar/?src=/climate/ipcc_tar/wg1/005.htm. Accessed July 2020.
[4] California Environmental Protection Agency. Air Resources Board. Assembly Bill 32 Overview. http://www.arb.ca.gov/cc/ab32/ab32.htm Accessed July 2020.

emissions also have important impacts on public health, the environment, and the Earth's climate. BC is a significant component of particle pollution, which has been linked to adverse health and environmental impacts through decades of scientific research. BC has been linked to a range of climate impacts, including increased temperatures, accelerated ice and snow melt, and disruptions to precipitation patterns.[5]

Table 3.8-1 – Description of Greenhouse Gases[6]

Greenhouse Gas	Description and Physical Properties	Sources
Nitrous Oxide (N20)	Nitrous oxide (laughing gas) is a colorless greenhouse gas. It has a lifetime of 114 years. Its global warming potential is 310.	Microbial processes in soil and water, fuel combustion, and industrial processes.
Methane (CH4)	Methane is a flammable gas and is the main component of natural gas. It has a lifetime of 12 years. Its global warming potential is 21.	Methane is extracted from geological deposits (natural gas fields). Other sources are landfills, fermentation of manure, and decay of organic matter.
Carbon dioxide (CO2)	Carbon dioxide (CO2) is an odorless, colorless, natural greenhouse gas. Carbon dioxide's global warming potential is 1. The concentration in 2005 was 379 parts per million (ppm), which is an increase of about 1.4 ppm per year since 1960.	Natural sources include decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources are from burning coal, oil, natural gas, and wood.
Chlorofluorocarbons (PFCs)	These are gases formed synthetically by replacing all hydrogen atoms in methane or ethane with chlorine and/or fluorine atoms. They are nontoxic, nonflammable, insoluble, and chemically unreactive in the troposphere (the level of air at the earth's surface). Global warming potentials range from 3,800 to 8,100.	Chlorofluorocarbons were synthesized in 1928 for use as refrigerants, aerosol propellants, and cleaning solvents. They destroy stratospheric ozone. The Montreal Protocol on Substances that Deplete the Ozone Layer prohibited their production in 1987.

[5] U.S. Environmental Protection Agency. Report to Congress on Black Carbon. March 2012. Executive Summary. https://www3.epa.gov/airquality/blackcarbon/2012report/ExecSummary.pdf. Page 1. Accessed July 2020.

[6] Compiled from a variety of sources, primarily from: United Nations, Intergovernmental Panel on Climate Change. 2007. *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Page 30. http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf. Accessed July 2020.

Greenhouse Gas	Description and Physical Properties	Sources
Hydrofluorocarbons (HCFCs)	Hydrofluorocarbons are a group of greenhouse gases containing carbon, chlorine, and at least one hydrogen atom. Global warming potentials range from 140 to 11,700.	Hydrofluorocarbons are synthetic manmade chemicals used as a substitute for chlorofluorocarbons in applications such as automobile air conditioners and refrigerants.
Perfluorocarbons (PFCs)	Perfluorocarbons have stable molecular structures and only break down by ultraviolet rays about 60 kilometers above Earth's surface. Because of this, they have long lifetimes, between 10,000 and 50,000 years. Global warming potentials range from 6,500 to 9,200.	Two main sources of perfluorocarbons are primary aluminum production and semiconductor manufacturing.
Sulfur hexafluoride (SF6)	Sulfur hexafluoride (SF_6) is an inorganic, odorless, colorless, and nontoxic, nonflammable gas. It has a lifetime of 3,200 years. It has a high global warming potential, 23,900.	This gas is manmade and used for insulation in electric power transmission equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas.
Nitrogen trifluoride (NF3)	Nitrogen trifluoride (NF_3) was added to Health and Safety Code section 38505(f)(7) as a greenhouse gas of concern. It has a high global warming potential of 17,200	This gas is used in electronics manufacture for semiconductors and liquid crystal displays.

Individual GHG compounds have varying global warming potential and atmospheric lifetimes. Carbon dioxide, the reference gas for global warming potential, has a global warming potential (GWP) of one. The GWP of a GHG is a measure of how much a given mass of a greenhouse gas is estimated to contribute to global warming. To describe how much global warming a given type and amount of greenhouse gas may cause, the carbon dioxide equivalent (CO_2e) is used. The calculation of the carbon dioxide equivalent is a consistent methodology for comparing greenhouse gas emissions since it normalizes various greenhouse gas emissions to a consistent reference gas, CO_2. For example, CH_4 has a GWP of 21 which indicates that CH_4 has 21 times

greater warming effect than CO2 on a molecule-per-molecule basis. CO2e is the mass emissions of an individual GHG multiplied by its GWP.

Emissions Inventories

In 2017, U.S. greenhouse gas emissions totaled 6,456.7 million metric tons of carbon dioxide equivalents, or 5,742.6 million metric tons of carbon dioxide equivalents after accounting for sequestration from the land sector.

Emissions decreased from 2016 to 2017 by 0.5 percent (after accounting for sequestration from the land sector). This decrease was largely driven by a decrease in emissions from fossil fuel combustion, which was a result of multiple factors, including a continues shift from coal to natural gas and increased use of renewables in the electric power sector, and milder weather that contributed to less overall electricity use.

Greenhouse gas emissions in 2017 (after accounting for sequestration from the land sector) were 13 percent below 2005 levels.[7]

Effects of Climate Change

Globally, climate change has the potential to impact numerous environmental resources through potential, though uncertain, impacts related to future air temperatures and precipitation patterns. The projected effects of global warming on weather and climate are likely to vary regionally, but are expected to include the following direct effects[8]:

- Higher maximum temperatures and more hot days over nearly all land areas;
- Higher minimum temperatures, fewer cold days and frost days over nearly all land areas;
- Reduced diurnal temperature range over most land areas;
- Increase of heat index over land areas; and
- More intense precipitation events.

Also, there are many secondary effects that are projected to result from global warming, including global rise in sea level, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity. While the possible outcomes and the feedback mechanisms involved

[7] U.S. Environmental Protection Agency. Greenhouse Gas Emissions. Inventory of U.S. Greenhouse Gas Emissions and Sinks. https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks. Accessed July 2020.
[8] United Nations, Intergovernmental Panel on Climate Change. 2001. *Climate Change 2001: The Scientific Basis*. Website: https://www.ipcc.ch/ipccreports/tar/wg1/pdf/WGI_TAR_full_report.pdf. Accessed July 2020.

are not fully understood, and much research remains to be done, the potential for substantial environmental, social, and economic consequences over the long term may be great.[9]

Regulatory Setting

Federal

Intergovernmental Panel on Climate Change

In 1988, the United Nations and the World Meteorological Organization established the Intergovernmental Panel on Climate Change to assess the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts, and options for adaptation and mitigation.

United Nations Framework Convention on Climate Change (Convention)

On March 21, 1994, the United States joined a number of countries around the world in signing the Convention. Under the Convention, governments gather and share information on greenhouse gas emissions, national policies, and best practices; launch national strategies for addressing greenhouse gas emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries; and cooperate in preparing for adaptation to the impacts of climate change.

The Paris Agreement

The Paris Agreement is an agreement within the United Nations Framework Convention on Climate Change (UNFCCC), dealing with greenhouse gas emissions mitigation, adaptation, and finance, signed in 2016. The Paris Agreement's long-term goal is to keep the increase in global average temperature to well below 2 degrees C, above pre-industrial levels; and to limit the increase to 1.5 degrees C, since this would substantially reduce the risks and effects of climate change. In June 2017, President Trump announced his intention to withdraw the United States from the agreement. Under this agreement, the earlier effective date of withdrawal for the U.S. is November 2020.

[9] United Nations, Intergovernmental Panel on Climate Change. 2001. *Climate Change 2001: The Scientific Basis*. Website: https://www.ipcc.ch/ipccreports/tar/wg1/pdf/WGI_TAR_full_report.pdf. Accessed July 2020.

United States Environmental Protection Agency Greenhouse Gas Endangerment Findings

"On December 7, 2009, Administrator Lisa Jackson signed a final action, under Section 202(a) of the Clean Air Act, finding that six key well-mixed greenhouse gases constitute a threat to public health and welfare, and that the combined emissions from motor vehicles cause and contribute to the climate change problem."[10]

"The Administrator finds that the current and projected concentrations of the six key well-mixed greenhouse gases — carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6) — in the atmosphere threaten the public health and welfare of current and future generations."[11]

Corporate Average Fuel Economy (CAFE) Standards

Established by the US Congress in 1975, the CAFE standards reduce energy consumption increasing the fuel economy of cars and light trucks. The National Highway Traffic Safe Administration (NHTSA) and US EPA jointly administer the CAFE standards. The US Congress has specified that CAFE standards must be set at the "maximum feasible level" with consideration given to: (1) technological feasibility; (2) economic practicality; (3) effect of other standards on f economy; and (4) need for the nation to conserve energy.

Fuel efficiency standards for medium- and heavy-duty trucks have been jointly developed by US EPA and NHTSA. The Phase 1 heavy-duty truck standards apply to combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles for model years 2014 through 2018, and result in a reduction in fuel consumption from 6 to 23 percent over the 2010 baseline, depending on the vehicle type. US EPA and NHTSA have also adopted the Phase 2 heavy-duty truck standards, which cover model years 2021 through 2027 and require the phase-in of a 5 to 25 percent reduction in fuel consumption over the 2017 baseline depending on the compliance year and vehicle type.

Vehicle Emissions Standards

In 1975, Congress enacted the Energy Policy and Conservation Act, which established the first fuel economy standards for on-road motor vehicles in the US. Pursuant to the act, US EPA and Nation Highway Traffic Safety Administration (NHTSA) are responsible for establishing

[10] United States Environmental Protection Agency. Climate Change. Climate Change Regulatory Initiatives. https://www.epa.gov/climatechange/climate-change-regulatory-initiatives. Accessed July 2020.
[11] United States Environmental Protection Agency. Climate Change. Endangerment and Cause or Contribute Findings for Greenhouse Gases under the Section 202(a) of the Clean Air Act. https://www.epa.gov/climatechange/endangerment-and-cause-or-contribute-findings-greenhouse-gases-under-section-202a. Accessed July 2020.

additional vehicle standards. In 2012, standards were adopted for model year 2017 through 2025 for passenger and light-duty trucks. Under the standards, by 2025 vehicles are required to achieve 54.5 mpg GHG reductions are achieved exclusively through fuel economy improvements) and 163 grams CO2 per mile. According to US EPA, a model year 2025 vehicle would emit one-half of the GHG emissions as compared to emissions from a model year 2010 vehicle. California harmonized its vehicle efficiency standards through 2025 with the federal standards.

In 2017, US EPA issued its Mid-Term Evaluation of the GHG emissions standards, finding that would be practical and feasible for automakers to meet the model year 202-2025 standards through a number of existing technologies. In 2018, US EPA revised its 2017 determination, and issued a proposed rule that would maintain the 2020 Corporate Average Fuel Economy (CAFE) and C2 standards for model years 2021 through 2026. The estimated CAFE and CO2 standards for model year 2020 are 43.7 mpg and 204 grams of CO2 per mile for passenger car and 31.3 mpg and 284 grams of CO2 per mile for light trucks, projecting an overall industry average of 37 mpg, as compared to 46.7 mpg under the standards issued in 2012. In 2019, California, joined by 16 other states and the District of Columbia, filed a petition challenging the US EPA's proposed rule to revise the vehicle emissions standards, arguing that US EPA had reached erroneous conclusions about the feasibility of meeting the existing standards. As of April 9, 2019, the case was pending, and oral arguments had not been scheduled. Accordingly, due to the uncertainty of future federal regulations, this analysis assumes that the existing CAFÉ standards will remain unchanged.

State

Executive Order S-3-05

"Executive Order S-3-05 was signed by Governor Schwarzenegger on June 1, 2005. This executive order established [GHG] emission reduction targets for California. Specifically, the executive order established the following targets:

- By 2010, reduce GHG emissions to 2000 levels.
- By 2020, reduce GHG emissions to 1990 levels.
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

The executive order additionally ordered that the Secretary of the California Environmental Protection Agency (Cal EPA) would coordinate oversight of the efforts among state agencies made to meet the targets and report to the Governor and the State Legislature biannually on progress made toward meeting the GHG emission targets. Cal EPA was also directed to

report biannually on the impacts to California of global warming, including impacts to water supply, public health, agriculture, the coastline, and forestry, and prepare and report on mitigation and adaptation plans to combat these impacts.

Assembly Bill 32: California Global Warming Solutions Act of 2006

In 2006, California passed the California Global Warming Solutions Act of 2006 (Assembly Bill 32; California Health and Safety Code Division 25.5, Sections 38500, et seq.), which requires the CARB to design and implement emission limits, regulations, and other measures, such that feasible and cost-effective statewide GHG emissions are reduced to 1990 levels by 2020.

In December 2007, CARB approved the 2020 emission limit of 427 million metric tons of CO2 equivalents (CO_2e) of greenhouse gases.[12] The 2020 target of 427 million metric tons of CO_2e requires the reduction of 169 million metric tons of CO_2e, or approximately 30 percent, from the State's projected 2020 emissions of 596 million metric tons of CO_2e (business-as-usual).

Also in December 2007, CARB adopted mandatory reporting and verification regulations pursuant to AB 32. The regulations became effective on January 1, 2009, with the first reports covering 2008 emissions. The mandatory reporting regulations require reporting for certain types of facilities that make up the bulk of the stationary source emissions in California. Currently, the draft regulation language identifies major facilities as those that generate more than 25,000 metric tons/year of CO_2e. Cement plants, oil refineries, electric-generating facilities/providers, cogeneration facilities, and hydrogen plants and other stationary combustion sources that emit more than 25,000 metric tons/year CO_2e, make up 94 percent of the point source CO_2e emissions in California.[13]

In June, 2008, CARB published its *Climate Change Draft Scoping Plan*.[14] The *Climate Change Draft Scoping Plan* reported that CARB met the first milestones set by AB 32 in 2007: developing a list of early actions to begin sharply reducing greenhouse gas emissions; assembling an inventory of historic emissions; and establishing the 2020 emissions limit. After consideration of public comment and further analysis, CARB adopted the *Climate Change Scoping Plan* (Scoping Plan) in December, 2008.[15] The Scoping Plan proposes a set of actions designed to reduce overall carbon emissions in California. Key elements of the Scoping Plan include:

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[12] California Air Resources Board. 2007. Staff Report. California 1990 Greenhouse Gas Level and 2020 Emissions Limit. November 16, 2007. https://www.arb.ca.gov/cc/inventory/1990level/1990level.htm. Accessed July 2020.
[13] California Air Resources Board. 2007. Staff Report. California 1990 Greenhouse Gas Level and 2020 Emissions Limit. November 16, 2007. https://www.arb.ca.gov/cc/inventory/1990level/1990level.htm. Accessed July 2020.
[14] California Air Resources Board. 2008. (includes edits made in 2009) Climate Change Scoping Plan, a framework for change. http://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm. Accessed July 2020. Page ES-1.
[15] Ibid.

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a Statewide renewables energy mix of 33 percent;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related greenhouse gas emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;
- Adopting and implementing measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State's long- term commitment to AB 32 implementation.[16]

The *Scoping Plan* notes that "[a]fter Board approval of this plan, the measures in it will be developed and adopted through the normal rulemaking process, with public input".[17]

The *Scoping Plan* states that local governments are "essential partners" in the effort to reduce greenhouse gas emissions, and that they have "broad influence and, in some cases, exclusive jurisdiction" over activities that contribute to greenhouse gas emissions. Local governments may contribute to significant direct and indirect greenhouse gas emissions through their planning and permitting processes, local ordinances, outreach and education efforts, and municipal operations. Many of the proposed measures to reduce greenhouse gas emissions rely on local government actions. The plan encourages local governments to reduce greenhouse gas emissions by approximately 15 percent from current levels by 2020.[18]

The *Scoping Plan* also included recommended measures that were developed to reduce greenhouse gas emissions from key sources and activities while improving public health, promoting a cleaner environment, preserving our natural resources, and ensuring that the impacts of the reductions are equitable and do not disproportionately impact low-income

[16] California Air Resources Board. First Update to the AB 32 Scoping Plan. https://www.arb.ca.gov/cc/scopingplan/document/updatedscopingplan2013.htm. Accessed May 2018.
[17] California Air Resources Board. First Update to the AB 32 Scoping Plan. https://www.arb.ca.gov/cc/scopingplan/document/updatedscopingplan2013.htm. Accessed May 2018.
[18] Ibid.

and minority communities. These measures also put the State on a path to meet the long-term 2050 goal of reducing California's greenhouse gas emissions to 80 percent below 1990 levels. These measures were presented to and approved by the CARB on December 11, 2008.

The total reduction for the recommended measures is 174 million metric tons/year of CO2e, slightly exceeding the 169 million metric tons/year of CO2e of reductions estimated to be needed in the Scoping Plan. The measures in the Scoping Plan approved by the Board will be developed over the next two years and be in place by 2012.

The First Update to the Scoping Plan was approved by the Board on May 22, 2014, and builds upon the initial Scoping Plan with new strategies and recommendations. The First Update identifies opportunities to leverage existing and new funds to further drive GHG emission reductions through strategic planning and targeted low carbon investments. The First Update defines CARB's climate change priorities for the next five years, and also sets the groundwork to reach long-term goals set forth in Executive Orders S-3-05 and B-16-2012. The Update highlights California's progress toward meeting the "near-term" 2020 GHG emission reduction goals defined in the initial Scoping Plan. It also evaluates how to align the State's "longer-term" GHG reduction strategies with other State policy priorities for water, waste, natural resources, clean energy, transportation, and land use." [19]

2017 CARB Climate Change Scoping Plan

In response to SB 32 and the 2030 GHG reduction target, CARB approved the 2017 Climate Change Scoping Plan Update (2017 Scoping Plan Update) in 2017. The 2017 Scoping Plan Update outlines the proposed framework of action for achieving the 2030 GHG target of 40 percent reduction in GHG emissions relative to 1990 levels. The 2017 Scoping Plan Update identifies key sectors of the state's implementation strategy, which includes improvements in low carbon energy, industry, transportation sustainability, natural and working lands, waste management and water. Through a combination of data synthesis and modeling, CARB determined that the statewide emissions limit is 260 million metric tonnes of carbon dioxide equivalent (MMTCO2e) and that further commitments will need to be made to achieve an additional reduction of 50 MMTCO2e beyond current policies and programs. The cornerstone of the 2017 Scoping Plan Update is an expansion of the Cap-and-Trade Program (discussed further below) to meet the

[19] California Air Resources Board. First Update to the AB 32 Scoping Plan. https://www.arb.ca.gov/cc/scopingplan/document/updatedscopingplan2013.htm. Accessed May 2018.

aggressive 2030 GHG emissions goal and ensure achievement of the 2030 limit set forth by E.O. B-30-15.

The 2017 Scoping Plan Update's strategy for meeting the state's 2030 GHG target incorporates the full range of legislative actions and state-developed plans that have relevance to the year 2030, including the following:

- Extending the LCFS beyond 2020 and increasing the carbon intensity reduction requirement to 18 percent by 2030;
- SB 350, which increases the RPS to 50 percent by 2030 and requires the CEC to establish annual targets for statewide energy efficiency savings and demand reduction that will achieve a cumulative doubling of statewide energy efficiency savings in electricity and natural gas final end uses of retail customers by 2030. These targets may be achieved through energy efficiency savings and demand reductions from a variety of programs, including but not limited to appliance and building energy efficiency standards and a comprehensive program to achieve greater energy efficiency standards in existing buildings;
- The 2016 Mobile Source Strategy is estimated to reduce consumption of petroleum-based fuels by 50 percent;
- The Sustainable Freight Action Plan to improve freight efficiency and transition to zero-emission freight handling technologies;
- SB 1383, which requires a 50 percent reduction in anthropogenic black carbon and a 40 percent reduction in hydrofluorocarbon and methane emissions below 2013 levels by 2030; and
- AB 398, which extends the state Cap-and-Trade Program through 2030.

In the 2017 Scoping Plan Update, CARB recommends statewide targets of no more than 6 MMTCO2e per capita by 2030 and no more than two metric tons CO2e per capita by 2050. CARB acknowledges that because the statewide per capita targets are based on the statewide GHG emissions inventory that includes all emissions sectors in the state (including large industrial sources covered under the state's cap and trade program), they are not applicable for use at the local level. Rather, it is appropriate for local jurisdictions to derive evidence-based local per-capita goals based on local emissions sectors and growth projections.

SB 1368

In 2006, the Senate Legislature adopted Senate Bill (SB) 1368, which was subsequently signed into law by the Governor. SB 1368 directs the California Public Utilities Commission to adopt a performance standard for greenhouse gas emissions for the future power purchases of California utilities. SB 1368 seeks to limit carbon emissions associated with electrical energy consumed in California by forbidding procurement arrangements for energy longer than five years from resources that exceed the emissions of a relatively clean, combined cycle natural gas power plant.

Senate Bill 97

Governor Schwarzenegger signed Senate Bill (SB) 97, a CEQA and greenhouse gas emission bill, into law on August 24, 2007. SB 97 requires the Governor's Office of Planning and Research (OPR) to prepare CEQA guidelines for the mitigation of GHG emissions, including, but not limited to, effects associated with transportation or energy consumption. The Resources Agency certified and adopted the guidelines on December 31, 2009 and submitted them for review by the Office of Administrative Law.

Governor's Office of Planning and Research (OPR)

Consistent with SB 97, on June 19, 2008, OPR released its Technical Advisory on CEQA and Climate Change, which was developed in cooperation with the Resources Agency, the California Environmental Protection Agency (Cal/EPA), and the CARB. The Technical Advisory offers the informal interim guidance regarding the steps lead agencies should take to address climate change in their CEQA documents, until CEQA guidelines are developed pursuant to SB 97 on how state and local agencies should analyze, and when necessary, mitigate greenhouse gas emissions (OPR). According to OPR, lead agencies should determine whether greenhouse gases may be generated by a proposed project, and if so, quantify or estimate the GHG emissions by type and source. Second, the lead agency must assess whether those emissions are individually or cumulatively significant. When assessing whether a project's effects on climate change are "cumulatively significant" even though project specific GHG contribution may be individually limited, the lead agency must consider the impact of the project when viewed in connection with the effects of past, current, and probable future projects. Finally, if the lead agency determines that the GHG emissions from the project as proposed are potentially significant, it must

investigate and implement ways to avoid, reduce, or otherwise mitigate the impacts of those emissions.[20]

Assembly Bill 1493 – Pavley Regulations

On September 24, 2009, the California Air Resources Board (CARB) adopted amendments to the "Pavley" regulations that reduce greenhouse gas emissions in new passenger vehicles from 2009 through 2016. These amendments are part of California's commitment toward a nation-wide program to reduce new passenger vehicle GHGs from 2012 through 2016. As discussed previously, the federal government adopted standards for model year 2012 through 2016 light-duty vehicles. In addition, US EPA and US Department of Transportation (USDOT) have adopted GHG emission standards for model year 2017 through 2025 vehicles. These standards are slightly different from the state's standards, but the state of California has agreed not to contest them, in part due to the fact that while the national standard would achieve slightly fewer reductions in California, the national standard would achieve greater reductions nationally and is stringent enough to meet state GHG emission reduction goals.

California Assembly Bill (AB) 341

In 2011, Assembly Bill 341 requires that integrated waste management plans set a policy goal of reducing not less than 75% of solid waste to be diverted from landfill disposal by 2020. AB 341 also requires that any business that generates more than 4 cubic yards of commercial solid waste per week to arrange for recycling services.

Senate Bill 375

Senate Bill 375 (Stats. 2880, Ch. 728) was built on AB 32 (California's 2006 climate change law). SB 375's core provision is a requirement for regional transportation agencies to develop a Sustainable Communities Strategy (SCS) in order to reduce GHG emissions from passenger vehicles. The SCS is one component of the existing Reginal Transportation Plan (RTP).

Title 20

California Code of Regulations, Title 20: Division 2, Chapter 4, Article 4, Sections 1601-1608: Appliance Efficiency Regulations regulates the sale of appliances in California. The Appliance Efficiency Regulations include standards for both federally regulated appliances and non-

[20] SJVAPCD. Final Staff Report Addressing Greenhouse Gas Emission Impacts Under the California Environmental Quality Act. http://www.valleyair.org/Programs/CCAP/12-17-09/1%20CCAP%20-%20FINAL%20CEQA%20GHG%20Staff%20Report%20-%20Dec%2017%202009.pdf. Accessed July 2020.

federally regulated appliances. Twenty-three categories of appliances are included within the scope of these regulations. The standards within these regulations apply to appliances that are sold or offered for sale in California, except those sold wholesale in California for final retail sale outside the state and those designated and sold exclusively for use in recreational vehicles or other mobile equipment.

Title 24 and the CALGreen Building Code

Title 24 is the California Building Standards code and is updated every three years. The last update was in 2019. CalGreen is one of 12 parts of Title 24. CalGreen is a set of mandatory green building standards for new construction that went into effect throughout California on January 1, 2020. These building standards apply to all new public and privately-constructed commercial and residential buildings. CALGreen is referred to officially as the California Green Building Standards Code and includes a matrix of mandatory requirements tailored to residential and non-residential building classifications, as well as two sets of voluntary measures (CALGreen Tier 1 and Tier 2) that provide a host of more stringent sustainable building practices and features. Among the key mandatory provisions are requirements that new buildings:

- Reduce indoor potable water use by at least 20% below current standards;
- Recycle or salvage at least 50% of construction waste;
- Utilize low VOC-emitting finish materials and flooring systems;
- Install separate water meters tracking non-residential buildings' indoor and outdoor water use;
- Utilize moisture-sensing irrigation systems for larger landscape areas;
- Receive mandatory inspections by local officials of building energy systems, such as HVAC and mechanical equipment, to verify performance in accordance with specifications in non-residential buildings exceeding 10,000 square feet;
- Requires electric vehicle charging infrastructure for new parking areas and additions to existing parking; and
- Requires shade trees to provide shade to 50% of new surface parking areas and additions to surface parking areas within 15 years, and shade to 20% of landscape areas and hardscape areas within 15 years.

Low Carbon Fuel Standard

In 2007, Executive Order S-01-07 mandates that the state: (1) establish a statewide goal to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020: and (2) adopt a Low Carbon Fuel Standard (LCFS) for transportation fuels in California. The overall goal

of the LCFS is to lower the carbon intensity of California transportation fuel. The 2017 Scoping Plan Update calls for the LCFS to reduce fuel carbon intensity by at least 18 percent by 2030. In 2018, CARB extended the LCFS program to 2030, making significant changes to the design and implementation of the Program including a doubling of the carbon intensity reduction to 20 percent by 2030.

CARB's Advanced Clean Car Program

The Advanced Clean Cars Emissions-Control Program was approved by CARB in 2012 and is closely associated with the Pavley regulations. The program requires a greater number of zero-emission vehicle models for years 2015 through 2025 to control smog, soot, and GHG emissions. This program includes the Low-Emissions Vehicle (LEV) regulations to reduce criteria air pollutants and GHG emissions from light-and medium-duty vehicles; and the Zero-Emissions Vehicle regulations (ZEV) to require manufactures to produce an increasing number of pure ZEV's (meaning battery and fuel cell electric vehicles) with the provision to produce plug-in hybrid electric vehicles (PHEV) between 2018 and 2025.

Cap-and-Trade Program

Initially authorized by AB 32, and extended through the year 2030 with the passage of AB 398 in 2017, the California Cap-and-Trade Program is a core strategy that the state is using to meet its GHG reduction targets for 2020 and 2030, and ultimate achieve an 80% reduction from 1990 levels by 2050. CARB designed and adopted the California Cap-and-Trade Program to reduce GHG emissions from "covered entities" (e.g., electricity generation, petroleum refining, cement production, and large industrial facilities that emit more than 25,000 metric tons CO2e per year), setting a firm cap on statewide GHG emissions and employing market mechanisms to achieve reductions. Under the Cap-and-Trade program, an overall limit is established for GHG emissions from capped sectors. The statewide cap for GHG emissions from the capped sectors commenced in 2013. The cap declines over time. Facilities subject to the cap can trade permits to emit GHGs.

SB 1383 (Short lived Climate Pollutants)

In 2016, SB 1383 required statewide reductions in short-lived climate pollutants (SLCPs) across various industry sectors. SLCPs covered under AB 1383 include methane, fluorinated gases, and black carbon – all GHGs with a much higher warming impact than carbon dioxide and with the potential to have detrimental effects on human health. SB 1383 requires the CARB to adopt a strategy to reduce methane by 40 percent, hydrofluorocarbon gases by 40 percent, and anthropogenic black carbon by 50 percent below 2013 levels by 2030. The methane emission

reduction goals include a 75 percent reduction in the level of statewide disposal of organic waste from 2014 levels by 2025.

Regional Agencies

San Joaquin Valley Air Pollution Control District

The San Joaquin Valley Air District has jurisdiction over eight counties in California's Central Valley: San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare and the San Joaquin Valley Air Basin portion of Kern. The Air District "is a public health agency whose mission is to improve the health and quality of life for all Valley residents through efficient, effective and entrepreneurial air quality- management strategies."[21]

On December 17, 2009, the San Joaquin Valley Air Pollution Control District (District) adopted the guidance: Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA and the policy: District Policy – Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency. The guidance and policy rely on the use of performance-based standards, otherwise known as Best Performance Standards (BPS), to assess significance of project specific greenhouse gas emissions on global climate change during the environmental review process, as required by CEQA.

Use of BPS is a method of streamlining the CEQA process of determining significance and is not a required emission reduction measure. Projects implementing BPS would be determined to have a less than cumulatively significant impact. Otherwise, demonstration of a 29 percent reduction in GHG emissions, from business-as-usual, is required to determine that a project would have a less than cumulatively significant impact. The guidance does not limit a lead agency's authority in establishing its own process and guidance for determining significance of project related impacts on global climate change."[22]

[21] San Joaquin Valley Air Pollution Control District. About The District. http://www.valleyair.org/General_info/aboutdist.htm#Mission. Accessed July 2020.

[22] San Joaquin Valley Air Pollution Control District. Climate Change Action Plan. http://www.valleyair.org/Programs/CCAP/CCAP_menu.htm. Accessed July 2020.

Tulare County General Plan

The Tulare County General Plan was adopted in August 2012. Tulare County has included goals, policies, objectives, work plans, and implementation measures to address air quality, GHG emissions, and climate change impacts.

The Tulare County General Plan includes three principles involving air quality:

1. Pursue economic, land use, and transportation programs that improve air quality in the County.
2. Encourage reduction in air-polluting activities, including industrial, agricultural, and transportation practices that contribute to poor air quality.
3. Promote land-se patterns that support alternative modes of transportation to reduce vehicle emissions and maintain air quality.

The policies included in the General Plan related to GHG emissions required the County to develop and maintain a climate action plan. The 2010 Tulare County Climate Action Plan (CAP) includes the following elements:[23]

- The purpose of the CAP, and its relationship to other state and regional regulatory and planning efforts
- Using the CAP for CEQA compliance
- Tulare County's GHG inventory
- Emission-reduction targets to demonstrate consistency with AB 32 and the CARB Scoping Plan
- The CAP strategy for achieving emission reduction targets
- The plan for tracking and monitoring progress in implementing the CAP

Thresholds of Significance

The significance criteria for assessing the impacts from GHG emissions are derived from the CEQA Environmental Checklist. According to the CEQA Checklist, a project causes a potentially significant impacts if it would:

[23] Tulare County Climate Action Plan. December 2018 Update. http://generalplan.co.tulare.ca.us/documents/GP/001Adopted%20Tulare%20County%20General%20Plan%20Materials/220Climate%20Action%20Plan/CLIMATE%20ACTION%20PLAN%202018%20UPDATE.pdf. Accessed July 2020.

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.

Impacts and Mitigation Measures

Impact 3.8-1: *Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?*

Less Than Significant. No material changes in operation and maintenance activities are anticipated with implementation of the proposed Project. The Project would have occasional vehicle trips and equipment usage during maintenance, and maintenance activity levels would be similar to existing operations. Therefore, GHG emissions would be negligible during proposed Project operation.

GHG emissions would occur during proposed Project construction, and would include emissions from fuel combustion in construction equipment, haul trucks, and worker commute vehicles; however, GHG would be temporary as construction activities are anticipated to occur over approximately two years. The proposed Project would implement best management practices during construction, such as minimizing unnecessary construction vehicle trips and idling time, which would reduce GHG emissions and make construction emissions even lower.

GHG emissions from the proposed Project are not expected to hinder of delay California's ability to meet the GHG reduction targets set in AB 32 and SB 32. Therefore, the proposed Project-generated GHG emissions during construction and operations would have a ***less than significant impact*** on the environment.

Impact 3.8-2: *Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gasses?*

Less Than Significant. Construction and operation of the proposed Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHG emissions.

CARB's Climate Change Scoping Plan Update represents the primary plan to reduce GHG emissions throughout California.[24] This plan is designated to reduce California's statewide GHG emissions by 40 percent as compared to the 1990 levels.[25] The proposed Project is consistent with the region's general plan, which include a goal of minimizing the possibility of loss of life, injury, or damage to property due to flood hazards. Project implementation is also consistent with the CARB policy of improving the resilience of infrastructure to climate change. Therefore, the operational GHG emissions would not hinder or otherwise conflict with the AB 32 or the AB 32 Scoping Plan or plan updates for reducing GHG emissions.

Although the Scoping Plan and updates identified and described a long-term vision and near-term activities to put California on the path to its interim and 2050 emissions reduction goals, many factors will influence the state's ability to attain the goals, including changes in regulatory standards, fuel, transportation, and power generation technologies, growth in population, land use development patterns, and other factors that cannot presently be known. Because reaching a conclusion about the Project's effect on compliance with the 2050 target identified in EO S-3-5 and the AB 32 would require speculation, this analysis is unable to reach a determination about the proposed Project's potential to result in a significant impact with regard to this goal. In all other respects, the proposed Project would not hinder or delay California's ability to meet the GHG reduction targets in AB 32 and the Scoping Plan and updates, nor would the proposed Project conflict with the Tulare Climate Action Plan, the Tulare County General Plan, or any Air District rules/regulations for reducing GHG emissions. Therefore, the impact from the proposed Project would be ***less than significant.***

Mitigation Measures:

1999 FEIS/FEIR: This topic was not included in the 1999 FEIS/FEIR. As such, no mitigation measures pertaining to this topic were identified.

New Mitigation Measures proposed by Lead Agency: No new or additional mitigation measures are necessary.

New Mitigation Measures proposed by SCE (Utility Modifications): No new or additional mitigation measures are necessary.

[24] California Air Resources Board. GHG Global Warming Potentials. https://ww2.arb.ca.gov/ghg-gwps#transition. Accessed July 2020.
[25] Ibid.

Cumulative Impacts:

The State of California, through AB 32, has acknowledged that GHG emissions are a statewide impact. Emissions generated by the proposed Project combined with past, present, and reasonably probable future projects could contribute to this impact. The CEQA Guidelines emphasize that effects of GHG emissions are cumulative in nature and should be analyzed in the context of CEQA's existing cumulative impacts analysis. The California Governor's Office of Planning and Research acknowledges that although climate change is cumulative in nature, not every individual project that emits GHGs must necessarily be found to contribute to a significant cumulative impact on the environment.

As discussed above, the proposed Project would not generate significant GHG emissions and would be consistent with GHG reduction plans. Therefore, the proposed Project's incremental contribution would be ***less than cumulatively considerable.***

3.8 Greenhouse Gas Emissions

This section of the SEIR evaluates the potential impacts to Greenhouse Gas Emissions (GHGs) associated with implementation of the proposed Project. No NOP comments were received pertaining to Greenhouse Gas Emissions.

Determination of Adequacy of 1999 FEIS/FEIR

The proposed Project footprint and area of potential effect (APE) has not changed since evaluation in the 1999 FEIS/FEIR. However, the CEQA Guidelines have been updated to include questions related to impacts to greenhouse gas emission. Therefore, the following determinations are made:

Topic	Further Analysis Required?	1999 FEIS/FEIR Analysis Sufficient?
a. Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	✓	
b. Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gasses?	✓	

Discussion:

The 1999 FEIS/FEIR did not address potential impacts to greenhouse gas (GHG) emissions because it was prepared prior to the 2010 amendment to the State CEQA Guidelines requiring the evaluation of environmental impacts related to GHG emissions. Therefore, this section provides a comprehensive analysis of GHG emissions associated with the proposed Project.

Environmental Setting

The United States Environmental Protection Agency (EPA) refers to climate change as, "…any significant change in the measures of climate lasting for an extended period of time. In other words, climate change includes major changes in temperature, precipitation, or wind patterns,

among other effects, that occur over several decades or longer."[1] The United Nations, Intergovernmental Panel on Climate Change (IPCC) refers to climate change as, "a change in the state of the climate that can be identified (e.g. using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. It refers to any change in climate over time, whether due to natural variability or because of human activity. This usage differs from that in the United Nations Framework Convention on Climate Change (UNFCCC), where climate change refers to a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods."[2]

The United Nations Intergovernmental Panel on Climate Change (IPCC) predicted that the global mean temperature change from 1990 to 2100 could range from 1.1 degrees Celsius (°C) to 6.4°C. Regardless of analytical methodology, global average temperatures and sea levels are expected to rise under all scenarios.[3] The report also concluded that "[w]arming of the climate system is unequivocal," and that "[m]ost of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations."

Greenhouse Gasses

Scientists have concluded that human activities are contributing to global climate change by adding large amounts of heat-trapping gases, known as GHG, to the atmosphere. Climate change is the variation of earth's climate over time, whether due to natural variability or as a result of human activities. The primary source of these GHG is fossil fuel use.

The six GHGs defined by Assembly Bill (AB) 32 (discussed further in the Regulatory Environment section) include carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6). The physical properties and common sources of these GHGs are described in Table 3.8-1. A seventh greenhouse gas, nitrogen trifluoride (NF3) was added to Health and Safety Code section 38505(g)(7) as a greenhouse gas of concern.[4] Other greenhouse gases include water vapor, ozone, and aerosols. Black carbon (BC)

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[1] U.S. Environmental Protection Agency. Climate Change: Basic Information. https://www.epa.gov/climatechange/climate-change-basic-information#Change. Accessed July 2020.
[2] United Nations, Intergovernmental Panel on Climate Change. 2007. *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Page 30. http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf. Accessed July 2020.
[3] United Nations, Intergovernmental Panel on Climate Change. 2001. *Climate Change 2001: The Scientific Basis*. Summary for Policymakers. http://www.grida.no/publications/other/ipcc_tar/?src=/climate/ipcc_tar/wg1/005.htm. Accessed July 2020.
[4] California Environmental Protection Agency. Air Resources Board. Assembly Bill 32 Overview. http://www.arb.ca.gov/cc/ab32/ab32.htm Accessed July 2020.

emissions also have important impacts on public health, the environment, and the Earth's climate. BC is a significant component of particle pollution, which has been linked to adverse health and environmental impacts through decades of scientific research. BC has been linked to a range of climate impacts, including increased temperatures, accelerated ice and snow melt, and disruptions to precipitation patterns.[5]

Table 3.8-1 – Description of Greenhouse Gases[6]

Greenhouse Gas	Description and Physical Properties	Sources
Nitrous Oxide (N20)	Nitrous oxide (laughing gas) is a colorless greenhouse gas. It has a lifetime of 114 years. Its global warming potential is 310.	Microbial processes in soil and water, fuel combustion, and industrial processes.
Methane (CH4)	Methane is a flammable gas and is the main component of natural gas. It has a lifetime of 12 years. Its global warming potential is 21.	Methane is extracted from geological deposits (natural gas fields). Other sources are landfills, fermentation of manure, and decay of organic matter.
Carbon dioxide (CO2)	Carbon dioxide (CO2) is an odorless, colorless, natural greenhouse gas. Carbon dioxide's global warming potential is 1. The concentration in 2005 was 379 parts per million (ppm), which is an increase of about 1.4 ppm per year since 1960.	Natural sources include decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources are from burning coal, oil, natural gas, and wood.
Chlorofluorocarbons (PFCs)	These are gases formed synthetically by replacing all hydrogen atoms in methane or ethane with chlorine and/or fluorine atoms. They are nontoxic, nonflammable, insoluble, and chemically unreactive in the troposphere (the level of air at the earth's surface). Global warming potentials range from 3,800 to 8,100.	Chlorofluorocarbons were synthesized in 1928 for use as refrigerants, aerosol propellants, and cleaning solvents. They destroy stratospheric ozone. The Montreal Protocol on Substances that Deplete the Ozone Layer prohibited their production in 1987.

[5] U.S. Environmental Protection Agency. Report to Congress on Black Carbon. March 2012. Executive Summary. https://www3.epa.gov/airquality/blackcarbon/2012report/ExecSummary.pdf. Page 1. Accessed July 2020.

[6] Compiled from a variety of sources, primarily from: United Nations, Intergovernmental Panel on Climate Change. 2007. *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Page 30. http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf. Accessed July 2020.

Greenhouse Gas	Description and Physical Properties	Sources
Hydrofluorocarbons (HCFCs)	Hydrofluorocarbons are a group of greenhouse gases containing carbon, chlorine, and at least one hydrogen atom. Global warming potentials range from 140 to 11,700.	Hydrofluorocarbons are synthetic manmade chemicals used as a substitute for chlorofluorocarbons in applications such as automobile air conditioners and refrigerants.
Perfluorocarbons (PFCs)	Perfluorocarbons have stable molecular structures and only break down by ultraviolet rays about 60 kilometers above Earth's surface. Because of this, they have long lifetimes, between 10,000 and 50,000 years. Global warming potentials range from 6,500 to 9,200.	Two main sources of perfluorocarbons are primary aluminum production and semiconductor manufacturing.
Sulfur hexafluoride (SF6)	Sulfur hexafluoride (SF_6) is an inorganic, odorless, colorless, and nontoxic, nonflammable gas. It has a lifetime of 3,200 years. It has a high global warming potential, 23,900.	This gas is manmade and used for insulation in electric power transmission equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas.
Nitrogen trifluoride (NF3)	Nitrogen trifluoride (NF_3) was added to Health and Safety Code section 38505(f)(7) as a greenhouse gas of concern. It has a high global warming potential of 17,200	This gas is used in electronics manufacture for semiconductors and liquid crystal displays.

Individual GHG compounds have varying global warming potential and atmospheric lifetimes. Carbon dioxide, the reference gas for global warming potential, has a global warming potential (GWP) of one. The GWP of a GHG is a measure of how much a given mass of a greenhouse gas is estimated to contribute to global warming. To describe how much global warming a given type and amount of greenhouse gas may cause, the carbon dioxide equivalent (CO_2e) is used. The calculation of the carbon dioxide equivalent is a consistent methodology for comparing greenhouse gas emissions since it normalizes various greenhouse gas emissions to a consistent reference gas, CO_2. For example, CH_4 has a GWP of 21 which indicates that CH_4 has 21 times

greater warming effect than CO2 on a molecule-per-molecule basis. CO2e is the mass emissions of an individual GHG multiplied by its GWP.

Emissions Inventories

In 2017, U.S. greenhouse gas emissions totaled 6,456.7 million metric tons of carbon dioxide equivalents, or 5,742.6 million metric tons of carbon dioxide equivalents after accounting for sequestration from the land sector.

Emissions decreased from 2016 to 2017 by 0.5 percent (after accounting for sequestration from the land sector). This decrease was largely driven by a decrease in emissions from fossil fuel combustion, which was a result of multiple factors, including a continues shift from coal to natural gas and increased use of renewables in the electric power sector, and milder weather that contributed to less overall electricity use.

Greenhouse gas emissions in 2017 (after accounting for sequestration from the land sector) were 13 percent below 2005 levels.[7]

Effects of Climate Change

Globally, climate change has the potential to impact numerous environmental resources through potential, though uncertain, impacts related to future air temperatures and precipitation patterns. The projected effects of global warming on weather and climate are likely to vary regionally, but are expected to include the following direct effects[8]:

- Higher maximum temperatures and more hot days over nearly all land areas;
- Higher minimum temperatures, fewer cold days and frost days over nearly all land areas;
- Reduced diurnal temperature range over most land areas;
- Increase of heat index over land areas; and
- More intense precipitation events.

Also, there are many secondary effects that are projected to result from global warming, including global rise in sea level, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity. While the possible outcomes and the feedback mechanisms involved

[7] U.S. Environmental Protection Agency. Greenhouse Gas Emissions. Inventory of U.S. Greenhouse Gas Emissions and Sinks. https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks. Accessed July 2020.
[8] United Nations, Intergovernmental Panel on Climate Change. 2001. *Climate Change 2001: The Scientific Basis*. Website: https://www.ipcc.ch/ipccreports/tar/wg1/pdf/WGI_TAR_full_report.pdf. Accessed July 2020.

are not fully understood, and much research remains to be done, the potential for substantial environmental, social, and economic consequences over the long term may be great.[9]

Regulatory Setting

Federal

Intergovernmental Panel on Climate Change

In 1988, the United Nations and the World Meteorological Organization established the Intergovernmental Panel on Climate Change to assess the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts, and options for adaptation and mitigation.

United Nations Framework Convention on Climate Change (Convention)

On March 21, 1994, the United States joined a number of countries around the world in signing the Convention. Under the Convention, governments gather and share information on greenhouse gas emissions, national policies, and best practices; launch national strategies for addressing greenhouse gas emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries; and cooperate in preparing for adaptation to the impacts of climate change.

The Paris Agreement

The Paris Agreement is an agreement within the United Nations Framework Convention on Climate Change (UNFCCC), dealing with greenhouse gas emissions mitigation, adaptation, and finance, signed in 2016. The Paris Agreement's long-term goal is to keep the increase in global average temperature to well below 2 degrees C, above pre-industrial levels; and to limit the increase to 1.5 degrees C, since this would substantially reduce the risks and effects of climate change. In June 2017, President Trump announced his intention to withdraw the United States from the agreement. Under this agreement, the earlier effective date of withdrawal for the U.S. is November 2020.

[9] United Nations, Intergovernmental Panel on Climate Change. 2001. *Climate Change 2001: The Scientific Basis*. Website: https://www.ipcc.ch/ipccreports/tar/wg1/pdf/WGI_TAR_full_report.pdf. Accessed July 2020.

United States Environmental Protection Agency Greenhouse Gas Endangerment Findings

"On December 7, 2009, Administrator Lisa Jackson signed a final action, under Section 202(a) of the Clean Air Act, finding that six key well-mixed greenhouse gases constitute a threat to public health and welfare, and that the combined emissions from motor vehicles cause and contribute to the climate change problem."[10]

"The Administrator finds that the current and projected concentrations of the six key well-mixed greenhouse gases — carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6) — in the atmosphere threaten the public health and welfare of current and future generations."[11]

Corporate Average Fuel Economy (CAFE) Standards

Established by the US Congress in 1975, the CAFE standards reduce energy consumption increasing the fuel economy of cars and light trucks. The National Highway Traffic Safe Administration (NHTSA) and US EPA jointly administer the CAFE standards. The US Congress has specified that CAFE standards must be set at the "maximum feasible level" with consideration given to: (1) technological feasibility; (2) economic practicality; (3) effect of other standards on f economy; and (4) need for the nation to conserve energy.

Fuel efficiency standards for medium- and heavy-duty trucks have been jointly developed by US EPA and NHTSA. The Phase 1 heavy-duty truck standards apply to combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles for model years 2014 through 2018, and result in a reduction in fuel consumption from 6 to 23 percent over the 2010 baseline, depending on the vehicle type. US EPA and NHTSA have also adopted the Phase 2 heavy-duty truck standards, which cover model years 2021 through 2027 and require the phase-in of a 5 to 25 percent reduction in fuel consumption over the 2017 baseline depending on the compliance year and vehicle type.

Vehicle Emissions Standards

In 1975, Congress enacted the Energy Policy and Conservation Act, which established the first fuel economy standards for on-road motor vehicles in the US. Pursuant to the act, US EPA and Nation Highway Traffic Safety Administration (NHTSA) are responsible for establishing

[10] United States Environmental Protection Agency. Climate Change. Climate Change Regulatory Initiatives. https://www.epa.gov/climatechange/climate-change-regulatory-initiatives. Accessed July 2020.
[11] United States Environmental Protection Agency. Climate Change. Endangerment and Cause or Contribute Findings for Greenhouse Gases under the Section 202(a) of the Clean Air Act. https://www.epa.gov/climatechange/endangerment-and-cause-or-contribute-findings-greenhouse-gases-under-section-202a. Accessed July 2020.

additional vehicle standards. In 2012, standards were adopted for model year 2017 through 2025 for passenger and light-duty trucks. Under the standards, by 2025 vehicles are required to achieve 54.5 mpg GHG reductions are achieved exclusively through fuel economy improvements) and 163 grams CO2 per mile. According to US EPA, a model year 2025 vehicle would emit one-half of the GHG emissions as compared to emissions from a model year 2010 vehicle. California harmonized its vehicle efficiency standards through 2025 with the federal standards.

In 2017, US EPA issued its Mid-Term Evaluation of the GHG emissions standards, finding that would be practical and feasible for automakers to meet the model year 202-2025 standards through a number of existing technologies. In 2018, US EPA revised its 2017 determination, and issued a proposed rule that would maintain the 2020 Corporate Average Fuel Economy (CAFE) and C2 standards for model years 2021 through 2026. The estimated CAFE and CO2 standards for model year 2020 are 43.7 mpg and 204 grams of CO2 per mile for passenger car and 31.3 mpg and 284 grams of CO2 per mile for light trucks, projecting an overall industry average of 37 mpg, as compared to 46.7 mpg under the standards issued in 2012. In 2019, California, joined by 16 other states and the District of Columbia, filed a petition challenging the US EPA's proposed rule to revise the vehicle emissions standards, arguing that US EPA had reached erroneous conclusions about the feasibility of meeting the existing standards. As of April 9, 2019, the case was pending, and oral arguments had not been scheduled. Accordingly, due to the uncertainty of future federal regulations, this analysis assumes that the existing CAFÉ standards will remain unchanged.

State

Executive Order S-3-05

"Executive Order S-3-05 was signed by Governor Schwarzenegger on June 1, 2005. This executive order established [GHG] emission reduction targets for California. Specifically, the executive order established the following targets:

- By 2010, reduce GHG emissions to 2000 levels.
- By 2020, reduce GHG emissions to 1990 levels.
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

The executive order additionally ordered that the Secretary of the California Environmental Protection Agency (Cal EPA) would coordinate oversight of the efforts among state agencies made to meet the targets and report to the Governor and the State Legislature biannually on progress made toward meeting the GHG emission targets. Cal EPA was also directed to

report biannually on the impacts to California of global warming, including impacts to water supply, public health, agriculture, the coastline, and forestry, and prepare and report on mitigation and adaptation plans to combat these impacts.

Assembly Bill 32: California Global Warming Solutions Act of 2006

In 2006, California passed the California Global Warming Solutions Act of 2006 (Assembly Bill 32; California Health and Safety Code Division 25.5, Sections 38500, et seq.), which requires the CARB to design and implement emission limits, regulations, and other measures, such that feasible and cost-effective statewide GHG emissions are reduced to 1990 levels by 2020.

In December 2007, CARB approved the 2020 emission limit of 427 million metric tons of CO2 equivalents (CO_2e) of greenhouse gases.[12] The 2020 target of 427 million metric tons of CO_2e requires the reduction of 169 million metric tons of CO_2e, or approximately 30 percent, from the State's projected 2020 emissions of 596 million metric tons of CO_2e (business-as-usual).

Also in December 2007, CARB adopted mandatory reporting and verification regulations pursuant to AB 32. The regulations became effective on January 1, 2009, with the first reports covering 2008 emissions. The mandatory reporting regulations require reporting for certain types of facilities that make up the bulk of the stationary source emissions in California. Currently, the draft regulation language identifies major facilities as those that generate more than 25,000 metric tons/year of CO_2e. Cement plants, oil refineries, electric-generating facilities/providers, cogeneration facilities, and hydrogen plants and other stationary combustion sources that emit more than 25,000 metric tons/year CO_2e, make up 94 percent of the point source CO_2e emissions in California.[13]

In June, 2008, CARB published its *Climate Change Draft Scoping Plan*.[14] The *Climate Change Draft Scoping Plan* reported that CARB met the first milestones set by AB 32 in 2007: developing a list of early actions to begin sharply reducing greenhouse gas emissions; assembling an inventory of historic emissions; and establishing the 2020 emissions limit. After consideration of public comment and further analysis, CARB adopted the *Climate Change Scoping Plan* (Scoping Plan) in December, 2008.[15] The Scoping Plan proposes a set of actions designed to reduce overall carbon emissions in California. Key elements of the Scoping Plan include:

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[12] California Air Resources Board. 2007. Staff Report. California 1990 Greenhouse Gas Level and 2020 Emissions Limit. November 16, 2007. https://www.arb.ca.gov/cc/inventory/1990level/1990level.htm. Accessed July 2020.
[13] California Air Resources Board. 2007. Staff Report. California 1990 Greenhouse Gas Level and 2020 Emissions Limit. November 16, 2007. https://www.arb.ca.gov/cc/inventory/1990level/1990level.htm. Accessed July 2020.
[14] California Air Resources Board. 2008. (includes edits made in 2009) Climate Change Scoping Plan, a framework for change. http://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm. Accessed July 2020. Page ES-1.
[15] Ibid.

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a Statewide renewables energy mix of 33 percent;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related greenhouse gas emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;
- Adopting and implementing measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State's long- term commitment to AB 32 implementation.[16]

The *Scoping Plan* notes that "[a]fter Board approval of this plan, the measures in it will be developed and adopted through the normal rulemaking process, with public input".[17]

The *Scoping Plan* states that local governments are "essential partners" in the effort to reduce greenhouse gas emissions, and that they have "broad influence and, in some cases, exclusive jurisdiction" over activities that contribute to greenhouse gas emissions. Local governments may contribute to significant direct and indirect greenhouse gas emissions through their planning and permitting processes, local ordinances, outreach and education efforts, and municipal operations. Many of the proposed measures to reduce greenhouse gas emissions rely on local government actions. The plan encourages local governments to reduce greenhouse gas emissions by approximately 15 percent from current levels by 2020.[18]

The *Scoping Plan* also included recommended measures that were developed to reduce greenhouse gas emissions from key sources and activities while improving public health, promoting a cleaner environment, preserving our natural resources, and ensuring that the impacts of the reductions are equitable and do not disproportionately impact low-income

[16] California Air Resources Board. First Update to the AB 32 Scoping Plan. https://www.arb.ca.gov/cc/scopingplan/document/updatedscopingplan2013.htm. Accessed May 2018.
[17] California Air Resources Board. First Update to the AB 32 Scoping Plan. https://www.arb.ca.gov/cc/scopingplan/document/updatedscopingplan2013.htm. Accessed May 2018.
[18] Ibid.

and minority communities. These measures also put the State on a path to meet the long-term 2050 goal of reducing California's greenhouse gas emissions to 80 percent below 1990 levels. These measures were presented to and approved by the CARB on December 11, 2008.

The total reduction for the recommended measures is 174 million metric tons/year of CO2e, slightly exceeding the 169 million metric tons/year of CO2e of reductions estimated to be needed in the Scoping Plan. The measures in the Scoping Plan approved by the Board will be developed over the next two years and be in place by 2012.

The First Update to the Scoping Plan was approved by the Board on May 22, 2014, and builds upon the initial Scoping Plan with new strategies and recommendations. The First Update identifies opportunities to leverage existing and new funds to further drive GHG emission reductions through strategic planning and targeted low carbon investments. The First Update defines CARB's climate change priorities for the next five years, and also sets the groundwork to reach long-term goals set forth in Executive Orders S-3-05 and B-16-2012. The Update highlights California's progress toward meeting the "near-term" 2020 GHG emission reduction goals defined in the initial Scoping Plan. It also evaluates how to align the State's "longer-term" GHG reduction strategies with other State policy priorities for water, waste, natural resources, clean energy, transportation, and land use." [19]

2017 CARB Climate Change Scoping Plan

In response to SB 32 and the 2030 GHG reduction target, CARB approved the 2017 Climate Change Scoping Plan Update (2017 Scoping Plan Update) in 2017. The 2017 Scoping Plan Update outlines the proposed framework of action for achieving the 2030 GHG target of 40 percent reduction in GHG emissions relative to 1990 levels. The 2017 Scoping Plan Update identifies key sectors of the state's implementation strategy, which includes improvements in low carbon energy, industry, transportation sustainability, natural and working lands, waste management and water. Through a combination of data synthesis and modeling, CARB determined that the statewide emissions limit is 260 million metric tonnes of carbon dioxide equivalent (MMTCO2e) and that further commitments will need to be made to achieve an additional reduction of 50 MMTCO2e beyond current policies and programs. The cornerstone of the 2017 Scoping Plan Update is an expansion of the Cap-and-Trade Program (discussed further below) to meet the

[19] California Air Resources Board. First Update to the AB 32 Scoping Plan. https://www.arb.ca.gov/cc/scopingplan/document/updatedscopingplan2013.htm. Accessed May 2018.

aggressive 2030 GHG emissions goal and ensure achievement of the 2030 limit set forth by E.O. B-30-15.

The 2017 Scoping Plan Update's strategy for meeting the state's 2030 GHG target incorporates the full range of legislative actions and state-developed plans that have relevance to the year 2030, including the following:

- Extending the LCFS beyond 2020 and increasing the carbon intensity reduction requirement to 18 percent by 2030;
- SB 350, which increases the RPS to 50 percent by 2030 and requires the CEC to establish annual targets for statewide energy efficiency savings and demand reduction that will achieve a cumulative doubling of statewide energy efficiency savings in electricity and natural gas final end uses of retail customers by 2030. These targets may be achieved through energy efficiency savings and demand reductions from a variety of programs, including but not limited to appliance and building energy efficiency standards and a comprehensive program to achieve greater energy efficiency standards in existing buildings;
- The 2016 Mobile Source Strategy is estimated to reduce consumption of petroleum-based fuels by 50 percent;
- The Sustainable Freight Action Plan to improve freight efficiency and transition to zero-emission freight handling technologies;
- SB 1383, which requires a 50 percent reduction in anthropogenic black carbon and a 40 percent reduction in hydrofluorocarbon and methane emissions below 2013 levels by 2030; and
- AB 398, which extends the state Cap-and-Trade Program through 2030.

In the 2017 Scoping Plan Update, CARB recommends statewide targets of no more than 6 MMTCO2e per capita by 2030 and no more than two metric tons CO2e per capita by 2050. CARB acknowledges that because the statewide per capita targets are based on the statewide GHG emissions inventory that includes all emissions sectors in the state (including large industrial sources covered under the state's cap and trade program), they are not applicable for use at the local level. Rather, it is appropriate for local jurisdictions to derive evidence-based local per-capita goals based on local emissions sectors and growth projections.

SB 1368

In 2006, the Senate Legislature adopted Senate Bill (SB) 1368, which was subsequently signed into law by the Governor. SB 1368 directs the California Public Utilities Commission to adopt a performance standard for greenhouse gas emissions for the future power purchases of California utilities. SB 1368 seeks to limit carbon emissions associated with electrical energy consumed in California by forbidding procurement arrangements for energy longer than five years from resources that exceed the emissions of a relatively clean, combined cycle natural gas power plant.

Senate Bill 97

Governor Schwarzenegger signed Senate Bill (SB) 97, a CEQA and greenhouse gas emission bill, into law on August 24, 2007. SB 97 requires the Governor's Office of Planning and Research (OPR) to prepare CEQA guidelines for the mitigation of GHG emissions, including, but not limited to, effects associated with transportation or energy consumption. The Resources Agency certified and adopted the guidelines on December 31, 2009 and submitted them for review by the Office of Administrative Law.

Governor's Office of Planning and Research (OPR)

Consistent with SB 97, on June 19, 2008, OPR released its Technical Advisory on CEQA and Climate Change, which was developed in cooperation with the Resources Agency, the California Environmental Protection Agency (Cal/EPA), and the CARB. The Technical Advisory offers the informal interim guidance regarding the steps lead agencies should take to address climate change in their CEQA documents, until CEQA guidelines are developed pursuant to SB 97 on how state and local agencies should analyze, and when necessary, mitigate greenhouse gas emissions (OPR). According to OPR, lead agencies should determine whether greenhouse gases may be generated by a proposed project, and if so, quantify or estimate the GHG emissions by type and source. Second, the lead agency must assess whether those emissions are individually or cumulatively significant. When assessing whether a project's effects on climate change are "cumulatively significant" even though project specific GHG contribution may be individually limited, the lead agency must consider the impact of the project when viewed in connection with the effects of past, current, and probable future projects. Finally, if the lead agency determines that the GHG emissions from the project as proposed are potentially significant, it must

investigate and implement ways to avoid, reduce, or otherwise mitigate the impacts of those emissions.[20]

Assembly Bill 1493 – Pavley Regulations

On September 24, 2009, the California Air Resources Board (CARB) adopted amendments to the "Pavley" regulations that reduce greenhouse gas emissions in new passenger vehicles from 2009 through 2016. These amendments are part of California's commitment toward a nation-wide program to reduce new passenger vehicle GHGs from 2012 through 2016. As discussed previously, the federal government adopted standards for model year 2012 through 2016 light-duty vehicles. In addition, US EPA and US Department of Transportation (USDOT) have adopted GHG emission standards for model year 2017 through 2025 vehicles. These standards are slightly different from the state's standards, but the state of California has agreed not to contest them, in part due to the fact that while the national standard would achieve slightly fewer reductions in California, the national standard would achieve greater reductions nationally and is stringent enough to meet state GHG emission reduction goals.

California Assembly Bill (AB) 341

In 2011, Assembly Bill 341 requires that integrated waste management plans set a policy goal of reducing not less than 75% of solid waste to be diverted from landfill disposal by 2020. AB 341 also requires that any business that generates more than 4 cubic yards of commercial solid waste per week to arrange for recycling services.

Senate Bill 375

Senate Bill 375 (Stats. 2880, Ch. 728) was built on AB 32 (California's 2006 climate change law). SB 375's core provision is a requirement for regional transportation agencies to develop a Sustainable Communities Strategy (SCS) in order to reduce GHG emissions from passenger vehicles. The SCS is one component of the existing Reginal Transportation Plan (RTP).

Title 20

California Code of Regulations, Title 20: Division 2, Chapter 4, Article 4, Sections 1601-1608: Appliance Efficiency Regulations regulates the sale of appliances in California. The Appliance Efficiency Regulations include standards for both federally regulated appliances and non-

[20] SJVAPCD. Final Staff Report Addressing Greenhouse Gas Emission Impacts Under the California Environmental Quality Act. http://www.valleyair.org/Programs/CCAP/12-17-09/1%20CCAP%20-%20FINAL%20CEQA%20GHG%20Staff%20Report%20-%20Dec%2017%202009.pdf. Accessed July 2020.

federally regulated appliances. Twenty-three categories of appliances are included within the scope of these regulations. The standards within these regulations apply to appliances that are sold or offered for sale in California, except those sold wholesale in California for final retail sale outside the state and those designated and sold exclusively for use in recreational vehicles or other mobile equipment.

Title 24 and the CALGreen Building Code

Title 24 is the California Building Standards code and is updated every three years. The last update was in 2019. CalGreen is one of 12 parts of Title 24. CalGreen is a set of mandatory green building standards for new construction that went into effect throughout California on January 1, 2020. These building standards apply to all new public and privately-constructed commercial and residential buildings. CALGreen is referred to officially as the California Green Building Standards Code and includes a matrix of mandatory requirements tailored to residential and non-residential building classifications, as well as two sets of voluntary measures (CALGreen Tier 1 and Tier 2) that provide a host of more stringent sustainable building practices and features. Among the key mandatory provisions are requirements that new buildings:

- Reduce indoor potable water use by at least 20% below current standards;
- Recycle or salvage at least 50% of construction waste;
- Utilize low VOC-emitting finish materials and flooring systems;
- Install separate water meters tracking non-residential buildings' indoor and outdoor water use;
- Utilize moisture-sensing irrigation systems for larger landscape areas;
- Receive mandatory inspections by local officials of building energy systems, such as HVAC and mechanical equipment, to verify performance in accordance with specifications in non-residential buildings exceeding 10,000 square feet;
- Requires electric vehicle charging infrastructure for new parking areas and additions to existing parking; and
- Requires shade trees to provide shade to 50% of new surface parking areas and additions to surface parking areas within 15 years, and shade to 20% of landscape areas and hardscape areas within 15 years.

Low Carbon Fuel Standard

In 2007, Executive Order S-01-07 mandates that the state: (1) establish a statewide goal to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020: and (2) adopt a Low Carbon Fuel Standard (LCFS) for transportation fuels in California. The overall goal

of the LCFS is to lower the carbon intensity of California transportation fuel. The 2017 Scoping Plan Update calls for the LCFS to reduce fuel carbon intensity by at least 18 percent by 2030. In 2018, CARB extended the LCFS program to 2030, making significant changes to the design and implementation of the Program including a doubling of the carbon intensity reduction to 20 percent by 2030.

CARB's Advanced Clean Car Program

The Advanced Clean Cars Emissions-Control Program was approved by CARB in 2012 and is closely associated with the Pavley regulations. The program requires a greater number of zero-emission vehicle models for years 2015 through 2025 to control smog, soot, and GHG emissions. This program includes the Low-Emissions Vehicle (LEV) regulations to reduce criteria air pollutants and GHG emissions from light-and medium-duty vehicles; and the Zero-Emissions Vehicle regulations (ZEV) to require manufactures to produce an increasing number of pure ZEV's (meaning battery and fuel cell electric vehicles) with the provision to produce plug-in hybrid electric vehicles (PHEV) between 2018 and 2025.

Cap-and-Trade Program

Initially authorized by AB 32, and extended through the year 2030 with the passage of AB 398 in 2017, the California Cap-and-Trade Program is a core strategy that the state is using to meet its GHG reduction targets for 2020 and 2030, and ultimate achieve an 80% reduction from 1990 levels by 2050. CARB designed and adopted the California Cap-and-Trade Program to reduce GHG emissions from "covered entities" (e.g., electricity generation, petroleum refining, cement production, and large industrial facilities that emit more than 25,000 metric tons CO2e per year), setting a firm cap on statewide GHG emissions and employing market mechanisms to achieve reductions. Under the Cap-and-Trade program, an overall limit is established for GHG emissions from capped sectors. The statewide cap for GHG emissions from the capped sectors commenced in 2013. The cap declines over time. Facilities subject to the cap can trade permits to emit GHGs.

SB 1383 (Short lived Climate Pollutants)

In 2016, SB 1383 required statewide reductions in short-lived climate pollutants (SLCPs) across various industry sectors. SLCPs covered under AB 1383 include methane, fluorinated gases, and black carbon – all GHGs with a much higher warming impact than carbon dioxide and with the potential to have detrimental effects on human health. SB 1383 requires the CARB to adopt a strategy to reduce methane by 40 percent, hydrofluorocarbon gases by 40 percent, and anthropogenic black carbon by 50 percent below 2013 levels by 2030. The methane emission

reduction goals include a 75 percent reduction in the level of statewide disposal of organic waste from 2014 levels by 2025.

Regional Agencies

San Joaquin Valley Air Pollution Control District

The San Joaquin Valley Air District has jurisdiction over eight counties in California's Central Valley: San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare and the San Joaquin Valley Air Basin portion of Kern. The Air District "is a public health agency whose mission is to improve the health and quality of life for all Valley residents through efficient, effective and entrepreneurial air quality- management strategies."[21]

On December 17, 2009, the San Joaquin Valley Air Pollution Control District (District) adopted the guidance: Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA and the policy: District Policy – Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency. The guidance and policy rely on the use of performance-based standards, otherwise known as Best Performance Standards (BPS), to assess significance of project specific greenhouse gas emissions on global climate change during the environmental review process, as required by CEQA.

Use of BPS is a method of streamlining the CEQA process of determining significance and is not a required emission reduction measure. Projects implementing BPS would be determined to have a less than cumulatively significant impact. Otherwise, demonstration of a 29 percent reduction in GHG emissions, from business-as-usual, is required to determine that a project would have a less than cumulatively significant impact. The guidance does not limit a lead agency's authority in establishing its own process and guidance for determining significance of project related impacts on global climate change."[22]

[21] San Joaquin Valley Air Pollution Control District. About The District. http://www.valleyair.org/General_info/aboutdist.htm#Mission. Accessed July 2020.

[22] San Joaquin Valley Air Pollution Control District. Climate Change Action Plan. http://www.valleyair.org/Programs/CCAP/CCAP_menu.htm. Accessed July 2020.

Tulare County General Plan

The Tulare County General Plan was adopted in August 2012. Tulare County has included goals, policies, objectives, work plans, and implementation measures to address air quality, GHG emissions, and climate change impacts.

The Tulare County General Plan includes three principles involving air quality:

1. Pursue economic, land use, and transportation programs that improve air quality in the County.
2. Encourage reduction in air-polluting activities, including industrial, agricultural, and transportation practices that contribute to poor air quality.
3. Promote land-se patterns that support alternative modes of transportation to reduce vehicle emissions and maintain air quality.

The policies included in the General Plan related to GHG emissions required the County to develop and maintain a climate action plan. The 2010 Tulare County Climate Action Plan (CAP) includes the following elements:[23]

- The purpose of the CAP, and its relationship to other state and regional regulatory and planning efforts
- Using the CAP for CEQA compliance
- Tulare County's GHG inventory
- Emission-reduction targets to demonstrate consistency with AB 32 and the CARB Scoping Plan
- The CAP strategy for achieving emission reduction targets
- The plan for tracking and monitoring progress in implementing the CAP

Thresholds of Significance

The significance criteria for assessing the impacts from GHG emissions are derived from the CEQA Environmental Checklist. According to the CEQA Checklist, a project causes a potentially significant impacts if it would:

[23] Tulare County Climate Action Plan. December 2018 Update. http://generalplan.co.tulare.ca.us/documents/GP/001Adopted%20Tulare%20County%20General%20Plan%20Materials/220Climate%20Action%20Plan/CLIMATE%20ACTION%20PLAN%202018%20UPDATE.pdf. Accessed July 2020.

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.

Impacts and Mitigation Measures

Impact 3.8-1: *Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?*

Less Than Significant. No material changes in operation and maintenance activities are anticipated with implementation of the proposed Project. The Project would have occasional vehicle trips and equipment usage during maintenance, and maintenance activity levels would be similar to existing operations. Therefore, GHG emissions would be negligible during proposed Project operation.

GHG emissions would occur during proposed Project construction, and would include emissions from fuel combustion in construction equipment, haul trucks, and worker commute vehicles; however, GHG would be temporary as construction activities are anticipated to occur over approximately two years. The proposed Project would implement best management practices during construction, such as minimizing unnecessary construction vehicle trips and idling time, which would reduce GHG emissions and make construction emissions even lower.

GHG emissions from the proposed Project are not expected to hinder of delay California's ability to meet the GHG reduction targets set in AB 32 and SB 32. Therefore, the proposed Project-generated GHG emissions during construction and operations would have a ***less than significant impact*** on the environment.

Impact 3.8-2: *Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gasses?*

Less Than Significant. Construction and operation of the proposed Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHG emissions.

CARB's Climate Change Scoping Plan Update represents the primary plan to reduce GHG emissions throughout California.[24] This plan is designated to reduce California's statewide GHG emissions by 40 percent as compared to the 1990 levels.[25] The proposed Project is consistent with the region's general plan, which include a goal of minimizing the possibility of loss of life, injury, or damage to property due to flood hazards. Project implementation is also consistent with the CARB policy of improving the resilience of infrastructure to climate change. Therefore, the operational GHG emissions would not hinder or otherwise conflict with the AB 32 or the AB 32 Scoping Plan or plan updates for reducing GHG emissions.

Although the Scoping Plan and updates identified and described a long-term vision and near-term activities to put California on the path to its interim and 2050 emissions reduction goals, many factors will influence the state's ability to attain the goals, including changes in regulatory standards, fuel, transportation, and power generation technologies, growth in population, land use development patterns, and other factors that cannot presently be known. Because reaching a conclusion about the Project's effect on compliance with the 2050 target identified in EO S-3-5 and the AB 32 would require speculation, this analysis is unable to reach a determination about the proposed Project's potential to result in a significant impact with regard to this goal. In all other respects, the proposed Project would not hinder or delay California's ability to meet the GHG reduction targets in AB 32 and the Scoping Plan and updates, nor would the proposed Project conflict with the Tulare Climate Action Plan, the Tulare County General Plan, or any Air District rules/regulations for reducing GHG emissions. Therefore, the impact from the proposed Project would be ***less than significant.***

Mitigation Measures:

1999 FEIS/FEIR: This topic was not included in the 1999 FEIS/FEIR. As such, no mitigation measures pertaining to this topic were identified.

New Mitigation Measures proposed by Lead Agency: No new or additional mitigation measures are necessary.

New Mitigation Measures proposed by SCE (Utility Modifications): No new or additional mitigation measures are necessary.

[24] California Air Resources Board. GHG Global Warming Potentials. https://ww2.arb.ca.gov/ghg-gwps#transition. Accessed July 2020.
[25] Ibid.

Cumulative Impacts:

The State of California, through AB 32, has acknowledged that GHG emissions are a statewide impact. Emissions generated by the proposed Project combined with past, present, and reasonably probable future projects could contribute to this impact. The CEQA Guidelines emphasize that effects of GHG emissions are cumulative in nature and should be analyzed in the context of CEQA's existing cumulative impacts analysis. The California Governor's Office of Planning and Research acknowledges that although climate change is cumulative in nature, not every individual project that emits GHGs must necessarily be found to contribute to a significant cumulative impact on the environment.

As discussed above, the proposed Project would not generate significant GHG emissions and would be consistent with GHG reduction plans. Therefore, the proposed Project's incremental contribution would be ***less than cumulatively considerable.***

3.9 Hazards and Hazardous Materials

This section of the SEIR identifies potential impacts of implementing the proposed Project pertaining to hazards and hazardous materials. No NOP comment letters were received pertaining to this topic.

Determination of Adequacy of 1999 FEIS/FEIR

The proposed Project footprint and area of potential effect (APE), as well as the proposed new maximum gross pool elevation raise has not changed since evaluation in the 1999 FEIS/FEIR. The 1999 FEIS/FEIR did not identify any significant impacts associated with hazards or hazardous materials. Therefore, the following determinations are made:

Topic	Further Analysis Required?	1999 FEIS/FEIR Analysis Sufficient?
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?		✓
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?		✓
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?		✓
d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?		✓
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety		✓

hazard or excessive noise for people residing or working in the project area?		
f. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?		✓
g. Expose people or structures either directly or indirectly to a significant risk of loss, injury or death involving wildland fires?		✓

Discussion:

The 1999 FEIS/FEIR did not identify any significant impacts regarding impacts to or from hazards or hazardous materials. However, the proposed Project is subject to current rules and regulations pertaining to the use, transport and storage of potentially hazardous materials as well as current regulations pertaining to hazardous materials associated with demolition. SCE activities associated with the Transmission and Distribution Line work is also subject to current regulations.

Hazardous waste was evaluated in the 1999 FEIS / FEIR. Based on newer hazardous waste investigations (Corps 2010), updated records search and communication with Lake Success operations staff, there have been no changes regarding hazardous waste within the expanded pool as investigated in 1998.

LTRID would conduct further hazardous waste investigations during property fee acquisitions. For cost-shared projects, LTRID is responsible for ensuring that the development and execution of federal, state, and/or locally required hazardous waste response actions are accomplished at 100 percent non-project cost. An Environmental Site Assessment (ESA) would be conducted to identify recognized environmental conditions, including the presence or likely presence of any hazardous substances or petroleum products under conditions that indicate an existing release, a past release, or the material threat of a release into structures, the ground, and groundwater or surface waters of the property. The ESA would be prepared in accordance with the American Society for Testing and Materials (ASTM 2005); Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process; and ER 1165-2-132, HTRW Guidance for Civil Works Projects. Any required cleanup would have to be completed prior to the U.S. government acquiring fee title to the property.

There are no schools located within ¼ mile of any Project activities and no airports are located within two miles of the Project, thus no impact to these facilities is anticipated. In addition, the Project would not significantly impact an adopted emergency response plan or emergency evacuation plan. All construction activity would occur on the proposed Project site and roads adjacent to the Project site would remain open, eliminating any potential impact related to access for emergency vehicles. Therefore, the Project would not interfere with an adopted emergency response plan or emergency evacuation plan, and no impact would occur.

For a discussion regarding wildland fires, refer to Section 3.20 – Wildfire.

SCE Project Components

An Environmental Data Resources, Inc. (EDR) record search of known environmental hazards was completed for the transmission component of the Proposed Project, as well as a desktop review of findings from state electronic databases, including the State Water Resources Control Board (SWRCB) GeoTracker database; Department of Toxic Substances Control (DTSC) EnviroStor database; Division of Oil, Gas, and Geothermal Well Resources (DOGGR) Well Finder database; and National Pipeline Mapping System (NPMS). A review of the databases identified two sites within 1 mile of SCE's Proposed Project activities associated with the transmission line. The sites are summarized as follows:

- The EDR review identified an underground storage tank (UST) that is located at Oakley Ranch, 29053 Avenue 176, Porterville, California. This UST site is approximately 2,000 feet east of the proposed Project Survey Area. No releases from the UST or impacts to the soil or groundwater were identified in the EDR report (EDR, 2017).

- The EDR review identified a U.S. Mines site that is located at 14200 Road 284, Porterville, California. This site is approximately 5,000 feet south of the proposed Project Survey Area, and north of Highway 190. The U.S. Mines site is operated by Porterville Rock and Recycle, Inc. The site was reported to have historical violations that have a status of "closed." No impacts to the soil or groundwater as a result of the violations were identified in the EDR report (EDR, 2017).

A review of the SWRCB GeoTracker database, DTSC EnviroStor database, DOGGR Well Finder database, and NPMS did not identify other environmental sites within 1 mile of SCE's distribution or transmission Project activities.

The areas associated with the distribution portion of SCE's Proposed Project were included in the hazardous, toxic and radioactive wastes (HTRW) investigation performed by the Corps. The 1999 FEIS/FEIR included an HTRW investigation and an updated HTRW investigation was performed in 2010 (Corps 2010) which included updated records searches and communication with Lake Success operations staff. There have been no changes regarding HTRW as evaluated in the 1999 FEIS/FEIR.

SCE Construction

During construction of SCE's Proposed Project activities, limited quantities of hazardous materials such as vehicle fuels and other maintenance materials would be used and stored in construction staging areas. There is potential for incidents involving the release of gasoline, diesel fuel, oil, hydraulic fluids and lubricants, paints, solvents, adhesives, and cleaning chemicals. In addition, waste oils, and waste hydraulic fluids, are anticipated to be generated during construction activities. Accidental spills and leaks of hazardous materials or hazardous wastes during construction could potentially result in impacts to soil or groundwater. Helicopter fueling would occur at helicopter staging areas or at local airports. Spills and leaks of hazardous materials during helicopter construction activities due to improper handling and storage of helicopter fuels could potentially result in impacts to soil or groundwater. The use of hazardous materials and substances during construction would be subject to the federal, state, and local health and safety requirements for the handling, storage, transportation, and disposal of hazardous materials, summarized in the Regulatory Setting. Proper implementation of these requirements would reduce the potential for SCE's Proposed Project activities to pose a potential hazard to the public or the environment. Implementation of the SWPPP and SPCC Plan would reduce the chance of a spill and would have provisions to contain spills to avoid contamination of water bodies and groundwater.

SCE will implement a Hazardous Materials Business Plan (HMBP), Hazardous Materials Management Plan (HMMP) and Fire Management Plan (see mitigation measures) prior to construction. All construction workers would receive training according to the HMMP. Among other things, the HMBP and HMMP would outline hazardous material handling, use, storage, and disposal requirements, as well as hazardous waste management practices. The plans would be developed to ensure that all hazardous materials and wastes would be handled and disposed of according to applicable rules and regulations. The HMBP and HMMP would include procedures to address hazardous material storage, employee training requirements, hazard recognition, fire safety, first-aid/emergency medical procedures, hazardous material release containment/control procedures, hazard communication training, Personal Protective Equipment

training, and release reporting requirements. Compliance with applicable federal, state, and local regulations, and implementation of the SWPPP, HMPB, HMMP, and all the associated BMPs would reduce impacts to less than significant.

SCE would also develop a Worker Environmental Awareness Plan as part of the Worker Environmental Awareness Training, which would provide site personnel with instruction regarding the SPCC and SWPPP and proposed SCE Project-specific BMPs. The Worker Environmental Awareness Plan would also provide instructions to notify the foreman and regional Spill Response Coordinator in case of a hazardous material spill or leak from equipment, or upon the discovery of soil contamination.

During construction activities, subsurface utilities or structures could be encountered, which could result in a release of hazardous substances if the structures are damaged. However, subsurface utilities and structures would be avoided by screening for subsurface structures prior to any trenching or excavation activities. Screening activities would include the use of Underground Service Alert, visual observations, and buried line locating equipment. Therefore, SCE's Proposed Project activities would not create a significant hazard to the public or the environment, and impacts would be less than significant.

SCE Operation

Operation and maintenance of SCE's Proposed Project may require the limited use of certain materials such as fuels, oils, solvents, and other chemical products that could pose a potential hazard to the public or the environment during routine transport, use, or disposal. Normal operation of the Transmission line would be controlled remotely through SCE control systems, and manually in the field as required. During operation and maintenance of SCE's Proposed Project, vehicles and equipment used for routine inspections and emergency repair would require the use of fuel and lubricants. Routine maintenance activities would include washing or replacing insulators, repairing or replacing other hardware components, tree trimming, and brush and weed control. While SCE's Proposed Project would not require long-term operational use, storage, treatment, disposal, or transport of significant quantities of hazardous materials, hazardous materials would be used during maintenance activities. The use of these chemicals would be temporary and contained within vehicles and equipment. Furthermore, hazardous chemicals used would be brought to and removed from the site by maintenance personnel, rather than stored onsite for extended periods. Therefore, impacts would be less than significant.

Hazardous material impacts could be associated with potential spills during normal operation or routine or emergency maintenance along the transmission line corridor. However, given the minor amount of work involved with SCE's Proposed Project operation and maintenance, the most likely incidents involving these hazardous materials would be associated with extremely minor spills or drips. Potentially adverse environmental effects of such incidents would be mitigated by thoroughly cleaning up minor spills as soon as they occurred. The impact would be ***less than significant.***

Therefore, the following determinations are made:

CEQA Guidelines Section 15162(a)(1-3)	YES	NO
1. Substantial changes are proposed in the project which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;		✓
2. Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.		✓
3. New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified shows any of the following: a. The project will have one or more significant effects not discussed in the previous EIR; b. Significant effects previously examined will be substantially more severe than shown in the previous EIR; c. Mitigation measures or alternatives previously found not to be feasible would in		✓

fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or d. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.		

Mitigation Measures:

The mitigation measures listed below are assigned to either the Lead Agency or SCE. The Lead Agency will be responsible for implementation and compliance with the measures listed under "New Mitigation Measures proposed by Lead Agency" and SCE will be responsible for implementation and compliance with the measures listed under "New Mitigation Measures proposed by SCE (Utility Modifications)".

1999 FEIS/FEIR: No mitigation measures pertaining to this topic were identified.

New Mitigation Measures proposed by Lead Agency:

HAZ-1 LTRID shall conduct further hazardous waste investigations during property fee acquisitions. An ESA would be conducted to identify recognized environmental conditions, including the presence or likely presence of any hazardous substances or petroleum products under conditions that indicate an existing release, a past release, or the material threat of a release into structures, the ground, and groundwater or surface waters of the property. The ESA would be prepared in accordance with the American Society for Testing and Materials (ASTM 2005); Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process; and ER 1165-2-132, HTRW Guidance for Civil Works

Projects. Any required cleanup would have to be completed prior to the U.S. government acquiring fee title to the property.

New Mitigation Measures proposed by SCE (Utility Modifications):

SCE HAZ-1 **Implement a Hazardous Materials Business Plan (HMBP) and Hazardous Materials Management Plan (HMMP).** A HMBP and HMMP would be prepared and implemented during construction to ensure that SCE's scope of work is executed in compliance with all applicable federal, state, and local laws and guidelines regarding handling of hazardous materials. The plans would outline hazardous material handling, use, storage, and disposal requirements, as well as hazardous waste management procedures. The plans would be developed to ensure that all hazardous materials and wastes associated with SCE's scope of work would be handled and disposed of according to applicable rules and regulations. The HMBP and HMMP would include programs to address hazardous material storage, employee training requirements, hazard recognition, fire safety, first-aid/emergency medical procedures, hazardous material release containment/control procedures, hazard communication training, personal protective equipment training, and release reporting requirements for SCE's scope of work. If onsite refueling is necessary to implement SCE's scope of work, BMPs should be implemented in accordance with the Spill Prevention Control and Countermeasures Plan (SPCC) and Storm Water Pollution Prevention Plan (SWPPP). Refueling stations and fuel tanks would be located, maintained and operated during construction in accordance with applicable laws and regulations pertaining to hazardous materials.

SCE HAZ-2 **Fire Management Plan**. A standard Fire Management Plan would be prepared and implemented during construction of SCE's scope of work. The plan would provide guidance for prevention, control, and extinguishment of fires. The plan would also provide smoking and fire related rules, storage and parking areas, usage of spark arrestors on construction equipment, and fire-suppression tools and equipment necessary for the execution of SCE's scope of work. The plan would also include the following measure:

- Cease work during Red Flag Warning events in areas where grassland or other vegetation would be susceptible to accidental ignition by SCE's scope of work activities that could ignite a fire (e.g., welding or use of equipment that could create a spark). During Red Flag Warning events, which are issued by the National Weather Service, all non-emergency construction and maintenance activities would cease in affected areas.

Cumulative Impacts:

The proposed action would minimize hazardous, toxic, and radiological waste from the area through the use of best management practices. After consultation with applicable federal and state regulatory agencies, HTRW sites affected by the proposed Project, including those on sites used to mitigate the loss of wildlife habitat values, must be remediated. Response actions must be acceptable to the U.S. Environmental Protection Agency and applicable state regulatory agencies, such as the California Environmental Protection Agency and the Regional Water Quality Control Board. Further investigations would be conducted and remediation plans would be developed in the preconstruction, engineering, and design phase of the Project. Therefore, the Project does not result in significant impacts associated with hazards or hazardous materials.

The scope for considering cumulative impacts to hazards and hazardous materials is generally site-specific rather than cumulative in nature because each project site has different hazardous considerations that would be subject to review. Construction of the individual development projects allowed under the land use designations of the Tulare County General Plan or other local planning authorities may involve the transportation, use, and/or disposal of hazardous materials, which may involve the use of equipment that contains hazardous materials (e.g., solvents and fuels, diesel-fueled equipment), or the transportation of excavated soil and/or groundwater containing contaminants from areas that are identified as being contaminated. Furthermore, some will inevitably transport or use hazardous materials within ¼ mile of a school, or other sensitive receptors such as hospitals and residences.

While some cumulative impacts will occur in the region as individual projects are constructed, State, federal and local regulations will reduce the risk to people in Tulare County. Considering the protection granted by local, State and federal agencies and their requirements for the use of hazardous materials in the region, as discussed above, the overall cumulative impact would be less than significant. As such, the proposed Project's incremental contribution to cumulative hazards and human health impacts would be ***less than cumulatively considerable***.

3.10 Hydrology and Water Quality

This section of the SEIR identifies potential impacts to hydrology, flooding and flood hazards, storm water management, and water supply and water quality associated with implementation of the proposed Project. No NOP comment letters were received pertaining to this topic.

Determination of Adequacy of 1999 FEIS/FEIR

The proposed Project footprint and area of potential effect (APE), as well as the proposed new maximum gross pool elevation raise has not changed since evaluation in the 1999 FEIS/FEIR. However, additional information is being provided herein regarding compliance with current rules and regulations pertaining to hydrology and water quality. Therefore, the following determinations are made:

Topic	Further Analysis Required?	1999 FEIS/FEIR Analysis Sufficient?
a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?		✓
b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?		✓
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: i. Result in substantial erosion or siltation on- or off- site; ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;		✓

iii. create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or iv. impede or redirect flood flows?		
d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?		✓
e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?		✓

Discussion:

Existing Hydrology and Water Quality Setting

The proposed Project is located in the western foothills of the Sierra Nevada mountain range in Frazier Valley (Amec Foster Wheeler, 2017), approximately 6 miles east of the City of Porterville within unincorporated Tulare County, California. Elevations of the Project site range from 650 to 700 feet above sea level. Lake Success, is a man-made reservoir that stores and supplies surface water to the Lower Tule River Irrigation District (LTRID). Lake Success was created by construction of the Success Dam across the Tule River by USACE in 1961 (USACE, 2017a). Success Dam and Lake are operated by the Corps for flood control and storage of irrigation water (USACE, 2017a).

The Tule River and Lake Success are located within the Tulare Lake Basin (Lakebed) drainage system. This basin includes the drainage area of the San Joaquin Valley south of the San Joaquin River. The Tulare Lakebed is part of a closed interior drainage system with no access to discharge into the sea. The Lakebed is located towards the south end of the San Joaquin Valley, where it receives water from the Kern, Tule, and Kaweah Rivers, as well as from southern distributaries of the Kings River. It was separated from the rest of the San Joaquin Valley by tectonic subsidence and alluvial fans extending out from Los Gatos Creek in the Coast Ranges and the Kings River in the Sierra Nevada. Above a threshold elevation of 207 to 210 feet, it can overflow into the San Joaquin River; however, no overflows have occurred after 1878 due to increasing diversions of tributary waters for agricultural irrigation and municipal water uses. The Tulare Lakebed was dry by 1899, except for residual wetlands and occasional floods. Over time, the decreasing lake size allowed agriculture to move into the productive Lakebed deposits in the valley. The basin comprises approximately 10.5 million acres, of which 3.25 million acres are in Federal ownership.

The closed nature of the Tulare Lake Basin allows minimal subsurface outflow, which leads to an accumulation of salts due to importation and evaporative uses of water. As a result, the largest water quality problem in the Tulare Lake Basin is the accumulation of salts. Overdrafting groundwater for municipal, agricultural, and industrial use compounds this problem. The Lakebed would continue to receive floodwaters from the Tule River, Kern, Kaweah, and parts of the Kings Rivers.

Regulatory Setting

Although the 1999 FEIS/FEIR did not identify any significant impacts regarding hydrology or water quality, the Project is subject to current hydrology and water quality regulations.

The Clean Water Act (CWA) is the federal law that regulates the discharge of pollutants into navigable waters. State water quality programs and regulations are chiefly the products of federal mandates put into effect through the CWA and managed by the EPA. The CWA requires states to establish numerical water quality criteria for a host of toxic discharges. In-stream water quality objectives and standards are contained in the state's region-based water quality control plans, more often referred to as basin plans. The regional water quality control board (WQCB) administers each hydrologic basin and associated basin plan. The Central Valley Regional Water Quality Control Board (CVRWQCB) administers Section 401 requirements of the CWA and the Water Quality Control Plan for the Tulare Lake Basin. The CVRWQCB attempts to maintain water quality through control of wastewater discharge.

In addition to the basin plans, the regional water quality control boards administer the EPA's National Pollutant Discharge Elimination System (NPDES) permits required by the CWA. In part, this regulation requires that discharges of stormwater associated with construction activity disturbing more than one acre is regulated as an individual discharge and must be permitted.

The Corps regulates structures and work in navigable waters of the U.S. that affect the navigable capacity of such waters under Section 10 of the Rivers and Harbors Act of 1899. The Corps also regulates the discharge of dredged or fill material into all regulated waters of the U.S., including wetlands, under Section 404 of the CWA. The Corps and the EPA both have responsibilities in administering this program and typically, issue permits for these regulated activities. Although The Corps does not issue itself permits for its own Civil Works projects, Corps regulations state that The Corps must apply the guidelines and substantive requirements of Section 404 to its activities.

Tulare County is located within the jurisdiction of the CVRWQCB. To regulate point sources of discharge, the agency administers the NDPES permit program. Types of point sources in Tulare

County include municipal wastewater, oil field wastewater, winery discharges, solid waste sites, and other industrial uses. Point source discharges must meet wastewater discharge requirements, or obtain a wastewater waiver. Non-point sources include drainage and percolation from agriculture, forestry, recreation, and stormwater runoff. Non-point sources are difficult to identify, but can be mitigated by best management practices. Based on the State of California's 2014/2016 303d list of impaired waterbodies, Lake Success is impaired for pH and the lower Tule River is impaired for Toxicity.

Lake Success is the only water of the United States (WOTUS) within the footprint of the proposed action. The Ordinary High Water Mark (OHWM) for this waterbody would be considered the elevation of the existing spillway's sill (655.1 feet NAVD88) and work under the OHWM falls under the jurisdiction of the CWA.

Supplemental Project Information

Water Quality

The proposed Project would construct a 10 foot-high concrete ogee weir across the emergency spillway, armor the bridge on California Highway 190 that passes over the lake, add rock slope protection to Frazier Dike to accommodate the increase in gross pool, adjust or flood-protect current recreation facilities, and relocate utilities. Phase 2 will also extend and widen the Tule Recreation Area boat ramps and raise/replace 15 transmission towers with 14 new hybrid structures and reconductor approximately two miles of transmission lines to meet minimum clearance criteria resulting from the increased gross pool. In addition, approximately 40 distribution poles will be either relocated or replaced due to the lake level rise. Some of this work would occur below the Ordinary High Water Mark (OHWM), which is equivalent to the current gross pool elevation and would fall under the CWA. Temporary land disturbance of greater than one acre would result from Project construction; therefore, the contactor would be required to prepare a NPDES storm water permit (Section 402 of the CWA). Stormwater runoff and spills of petroleum based products during construction activities have the potential to effect water quality conditions at Lake Success and downstream on the Tule River. The Corps is required to obtain a 401 Water Quality Certification and conduct a 404(b)(1) evaluation to comply with the CWA.

Construction activities would include enlarging Lake Success by raising the spillway elevation 10 feet with an ogee weir and excavating to widen the spillway from 200 feet to 365 feet. These changes would increase the capacity of the reservoir by 28,000 acre-feet. In compliance with the CWA and to avoid impacts, a site specific plan with measures addressing proper disposal of silt, debris, refuse, or other pollutants associated with construction on the water side of the spillway

would be implemented to prevent fill or rock material and road surface runoff from spilling into the reservoir. With implementation of BMPs required in the construction general permit and the water quality certification and measures, as applicable, effects to water quality are expected to be less than significant.

SCE Project Components

Construction of the SCE Transmission and Distribution Line Project components would disturb a surface area greater than one acre. Therefore, SCE would be required to obtain coverage under the Construction General Permit (CGP) and prepare a SWPPP. The SWPPP will include a site map, description of proposed construction activities, inspection and monitoring requirements, and the BMPs to be used to protect storm water runoff and water quality. The SWPPP will also contain specifications related to inspection, monitoring, and maintenance requirements to ensure that BMPs are correctly implemented to protect storm water runoff and water quality. The specifications for the types and frequency of inspections and monitoring requirements are dictated by the Risk Level or Type (1, 2, or 3) that the project is determined to be by the risk determination performed during SWPPP development.

Commonly used BMPs are storm water runoff quality control measures (perimeter, erosion, and sediment controls), dewatering procedures, good housekeeping, and concrete waste management. The SWPPP would be based on final engineering design and would include all Project components.

SCE would also prepare and implement a Hazardous Materials Management Plan during construction (as described in Section 3.9 Hazards and Hazardous Materials), which would outline hazardous material handling, use, and storage requirements, as well as include procedures to implement in the case of a hazardous material release. Personnel would be trained on the individual responsibilities under the Clean Water Act, the SWPPP, site-specific BMPs, the locations of Safety Data Sheets for the Project, and steps to take in case of a hazardous materials spill or leak or the discovery of groundwater contamination. Implementation of this Plan, along with the BMPs identified in the SWPPP, would reduce the potential for water quality degradation during proposed Project construction to less-than-significant levels.

Wastewater would be generated by construction workers over the approximately 10-month construction duration of SCE's proposed Project components. However, the amount of wastewater generated during the short construction period would be minimal and would be contained within portable restrooms and treated and disposed of by a licensed contractor. The

portable restrooms will be managed in compliance with the SWPPP. No wastewater would be discharged from the site. Thus, impacts would be less than significant.

Water Supply

During construction, the proposed Project would use water from local sources for dust control, cleanup, and construction crew member use (consumption and temporary portable restrooms). Water use during construction would be temporary and would not substantially deplete groundwater supplies.

One of the objectives of the Project is to increase water storage capacity of Lake Success. The Lower Tule River Irrigation District and affiliated local irrigation districts in the area have expressed a need for increased water supply in the basin. The ever-changing cycle of wet and dry years cases the area to be vulnerable to inadequate irrigation water supply. During dry years, groundwater pumping is relied upon heavily for irrigation needs. Additional irrigation storage space would increase the ability of the irrigation districts to make better use of the existing water supply of the area. Increased storage capacity would allow holding water for a longer period in the irrigation season that otherwise would be released and could cause damage in the Tulare Lakebed, thus making it available for irrigation purposes at a time that is appropriate for crop needs. It also reduces need for groundwater pumping, which reduces overdraft, costs of pumping, and ground subsidence. Thus, the Project will not deplete groundwater supplies and the impact is considered less than significant.

SCE Project Components

Groundwater could be encountered during construction of SCE's Transmission and Distribution Line Project components. Groundwater encountered would be pumped and dispersed onsite or disposed of at an offsite disposal facility, in accordance with applicable laws. The Project-specific SWPPP would also include BMPs addressing dewatering, designed to ensure that the dewatering occurs in compliance with CVRWQCB permits and that dewatering discharges do not cause erosion at the discharge point. When conducted in compliance with CVRWQCB permits, dispersion of pumped groundwater onto surface areas near construction sites would effectively replace the groundwater removed, resulting in no net change in aquifer volume or groundwater table level. If groundwater is disposed of at an offsite facility, groundwater would be removed, but the impact would be temporary relative to the annual cycle of precipitation and insignificant given the duration of SCE's construction activities (10 months) and excavation depths. Impacts to groundwater supplies would therefore be less than significant.

Flooding

Flooding is a major risk and concern to citizens living in the areas downstream of Lake Success. Flooding downstream of the lake can cause extensive damage to residences, valuable agricultural farmland, and public facilities. Additional storage capacity of Tule River flows would offer opportunities to increase flood protection to downstream areas in the City of Porterville and the Tulare Lakebed.

The winter rain floods generally occur from November through April and are characterized by sharp peaks with most of the volume occurring within a few days. The snow melt floods occur from April through June and have a much larger volume, but the runoff occurs over a number of months. Peak snow melt flows never exceed channel capacity and cause overland flooding. However, they may exceed irrigation and spreading demands for extended periods of time. When flood releases from the Richard L. Schafer Dam exceed irrigation and spreading demands, the excess water flows into the Tulare Lakebed. The average annual runoff in the Tule River system is 145,020 acre-feet. The peak recorded rain flow into Lake Success was 76,900 cfs in December 1966.

To date, four of the highest peak flows of record at the Richard L. Schafer Dam site have occurred since 1950, going back to the first account of flooding in 1861. The largest rain flood of record was in December 1966, the second largest snowmelt of record was April-July 1969, and the largest of this century was 1983, all of which have occurred since the construction of the dam in 1961. The resulting flood damages indicate that although the existing dam provides substantial protection, a large flood greater than the existing level of protection would cause significant damages.

Based on historic floods and increased frequency of storms, there are high risks for serious flooding. This can be addressed by providing increased flood protection for the City of Porterville, the agricultural land along the Tule River, and the Tulare Lakebed Region.

Before the early 1900's, flood damage was nominal because of sparse urban development in the alluvial flood plain, although some of the floods were very large. Due to the increased development over the years, the more recent floods have caused substantial damage to homes, businesses, public facilities and utilities, and highly developed agricultural land. Future building development in the flood plain is required to be elevated above the 100-year flood elevation within the Federal Emergency Management Agency (FEMA) designated flood hazard area.

Richard L. Schafer Dam controls flows to a release of 3,200 cfs (reach 2 damages start at 2,950 cfs). The dam provides about a 1 in 50 chance of flooding to the City of Porterville (a 1 in 14 chance of flooding west of the City of Porterville, and 1 in 3.3 chance of flooding in the Tulare Lakebed).

The potential for flooding still exists from larger floods. The existing dam has 82,300 acre-feet of joint-use flood control and water conservation space. Flows over the existing spillway in excess of approximately 7,500 cfs would fail Tule River channel levees downstream of the dam. The overflow would pass through two abandoned gravel pits before entering the urbanized areas east of the City of Porterville.

The source of flood water in the flood plain is primarily from Tule River overflows. Significant flooding occurs from Porter Slough in the City of Porterville for 80-year and higher flood events due to the limited channel capacity in the downtown area.

The depth of flooding in east Porterville at Vista Drive ranges from 0.5 feet for the 80-year flood event to 2 feet for the 250-year event. Within central City of Porterville, depth of flooding ranges from 0.5 feet for the 100-year event to 1 foot for the 250-year event. West of the City of Porterville upstream of the Friant-Kem Canal, depth of flooding ranges from 0.5 feet for the 80-year event to 1.5 feet for the 250-year event. South of the City of Porterville, depth of flooding ranges from 1.5 feet for the 250-year event to 3 feet for the 500 year event.

Downstream of Highway 65 there is extensive overflows from the Tule River into the surrounding flood plain. The Friant-Kem Canal acts as a barrier across the flood plain and causes ponding upstream. Flood flows occur as sheet flow between the Friant-Kem Canal and Lakeland Canal east of Corcoran. Flood flows into the Tulare Lakebed are from the Tule River channel. To the extent that capacity allows, flood flows in the Lakebed are pumped to the South Flood Area detention ponds (South Wilbur and Hacienda cells). Flood flows that exceed the capacity of the conveyance system or detention ponds ends up flooding cropped areas in the Lakebed.

Between the City of Porterville and the Tulare Lakebed, the Tule River flood plain breaks out into an alluvial fan which is mainly agricultural. Approximately 22 miles downstream from the City of Porterville, Elk Bayou (a distributary of the Kaweah River) enters the Tule River.

As indicated herein and as analyzed in the 1999 FEIS/FEIR, one of the objectives of the proposed Project is to reduce flooding. Therefore, the impact is considered less than significant.

SCE Project Components

As discussed above, during construction of SCE's Transmission and Distribution Line Project components, SCE would implement SWPPP BMPs to control surface runoff and to reduce effects of alteration of stream flows during temporary ground disturbance. Implementation of the BMPs would reduce the potential for SCE's Proposed Project activities to affect surrounding drainage

patterns, thus reducing the likelihood of on- or offsite changes in flooding potential. This impact would be less than significant.

Because SCE's Proposed Project components would replace existing facilities, SCE's Proposed Project would generally not alter nearby drainage patterns. Disturbance areas around removed structures would be compacted and smoothed to match the surrounding grade. In addition, as part of the postconstruction requirements in the CGP, SCE would be required to, at a minimum, stabilize all disturbed areas to minimize post-construction changes in drainage patterns. Therefore, SCE's Proposed Project would not substantially alter the existing drainage pattern of the site or area, incl**u**ding through the alteration of the course of a stream or river, or a substantial increase in the rate or amount of surface runoff in a manner which would result in flooding on- or offsite resulting in impact from operation. The impact is considered ***less than significant***.

Therefore, the following determinations are made:

CEQA Guidelines Section 15162(a)(1-3)	**YES**	**NO**
1. Substantial changes are proposed in the project which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;		✓
2. Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.		✓
3. New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified shows any of the following: a. The project will have one or more significant effects not discussed in the previous EIR; b. Significant effects previously examined will be substantially more severe than shown in the previous EIR;		✓

c. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or d. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.		

Mitigation Measures:

The mitigation measures listed below are assigned to either the Lead Agency or SCE. The Lead Agency will be responsible for implementation and compliance with the measures listed under "New Mitigation Measures proposed by Lead Agency" and SCE will be responsible for implementation and compliance with the measures listed under "New Mitigation Measures proposed by SCE (Utility Modifications)".

1999 FEIS/FEIR: No mitigation measures pertaining to this topic were identified.

New Mitigation Measures proposed by Lead Agency:

HYD-1 Prior to construction, the contractor would be required to prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) as part of the construction general permit from the CVRWQCB. This would also include a spill prevention plan detailing the construction activities to take place, BMPs to be implemented to prevent any discharges of stormwater into waterways, and inspection and monitoring activities that would be conducted to address spills and maintain stormwater BMPs. The following standard BMPs would be expected to be implemented to avoid and minimize the potential effects on water quality,

ensuring that construction of the proposed action would have less than significant effects on these resources:

- Appropriate erosion control measures would be incorporated into the SWPPP by the construction contractor in order to prevent sediment from entering waterways and to minimize temporary turbidity impacts. Examples include, but are not limited to: straw bales/wattles, erosion blankets, silt fencing, silt curtains, mulching, revegetation, and temporary covers. Sediment and erosion control measures would be maintained by the contractor during construction at all times. Control measures would be inspected periodically by the construction contractor, particularly during and after significant rain events.
- The contractor would use a water truck or other appropriate measures to control fugitive dust on haul roads, construction areas, and stockpiles.
- A fuels spill management plan would be developed for the Project by the construction contractor and would be implemented by the contractor.
- Construction equipment and vehicles would be fueled and maintained in specified staging areas only, which would be designed to capture potential spills. These areas cannot be near any ditch, stream, or other body of water or feature that may convey water to a nearby body of water.
- Fuels and hazardous materials would not be stored on site. Any spills of hazardous material would be cleaned up immediately by the construction contractor.
- Construction vehicles and equipment would be inspected frequently and appropriately maintained by the construction contractor to help prevent dripping of oil, lubricants, or any other fluids.
- Construction activities would be scheduled by the contractor to avoid as much of the wet season as practicable. Construction personnel would be trained in storm water pollution prevention practices by the construction contractor.
- In areas proposed for revegetation, initiation and completion of revegetation work would be done by the contractor in a timely manner to control erosion.

New Mitigation Measures proposed by SCE (Utility Modifications): No new or additional mitigation measures are necessary. SCE will comply with existing rules and regulations pertaining to preparation of a SWPPP and implementations of BMPs.

Cumulative Impacts:

The scope for considering cumulative impacts to hydrology and water quality are the geographic areas within the Tulare Basin as well as areas covered by the Tulare County General Plan / EIR and the City of Porterville General Plan / EIR. Construction activities have the potential to temporarily degrade water quality through the direct release of soil and construction materials into water bodies or the indirect release of contaminants into water bodies through activities. Related projects are not likely to be under construction during the same timeframe as this Project. As Lake Success is on Federal land, and the proposed action would be at the outflow of the lake, concurrent activities that could affect water quality are under the jurisdiction of the Corps, and would be appropriately coordinated. However, if construction occurs downstream of the proposed action during the same timeframe water quality could be diminished primarily due to increased turbidity, if the proposed action's BMPs fail.

Projects that further urban development could increase runoff as the amount of impervious surfaces is increased. Potential new housing developments may cause more stormwater runoff laden with contaminants common in urban/suburban areas (i.e. pesticides, lawn fertilizers, hydrocarbons). The increased volume of municipal sewage from the new developments could also introduce more pollutants to waters within the Tulare Basin. The method by which treated wastewater is discharged would determine the severity of the impact to water quality from new and proposed residential subdivisions near the Project area. All projects would be required to coordinate with the RWQCB and overall water quality would be required to meet the Basin Plan objectives. The proposed Project activities would result in less-than-significant effects to water quality. Degradation of water quality from the Project would be short term and limited to the construction period.

The Project would provide beneficial impacts to water supply and flooding, as the primary objectives of the Project include increased water storage capacity and a decrease in flooding impacts. Thus, there are no cumulative impacts associated with these topics.

Therefore, the proposed Project's incremental contribution to cumulative hydrology and water quality impacts would be ***less than cumulatively considerable***.

3.11 Land Use

This section of the SEIR evaluates land use compatibility within the Tulare County General Plan / EIR and the City of Porterville General Plan / EIR and if the proposed Project would cause a division within an established community. No NOP comment letters were received pertaining to this topic.

Determination of Adequacy of 1999 FEIS/FEIR

The proposed Project footprint and area of potential effect (APE), as well as the proposed new maximum gross pool elevation raise has not changed since evaluation in the 1999 FEIS/FEIR. The 1999 FEIS/FEIR did not identify any significant impacts associated with land use. However, additional information is being provided herein regarding land use impacts.

Topic	Further Analysis Required?	1999 FEIS/FEIR Analysis Sufficient?
a. Physically divide and established community?		✓
b. Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?		✓

Discussion:

The 1999 FEIS/FEIR did not identify any significant impacts regarding land use. The land use within the vicinity of the reservoir consists primarily of grazing land and natural vegetation. There is no established community in the immediate vicinity. Farmland of local importance exists around the north, middle, and south forks of the Tule River Basin.[1]

Lake Success falls within the boundaries of the Tulare County General Plan (2010). This plan includes a comprehensive statement of the development policies and standards that prescribe

[1] California Department of Conservation. California Important Farmland Finder. https://maps.conservation.ca.gov/DLRP/CIFF/. Accessed July 2020.

land use and circulation patterns for the foothill region of the county. The plan encompasses 675,641 acres of land bounded on the east by the federally-owned parks in the Sierra Nevada and some privately owned lands on the San Joaquin Valley floor. Nearly 85 percent of the land within this region is dedicated to agricultural uses. The lands that are developable are located mainly along transportation corridors where geographic and geological characteristics are conducive to development. In total, less than one percent of land within this region is vacant or unused.

By raising the lake's gross pool elevation, the proposed Project would affect approximately 609 acres of land around the lake. With the Project, residential properties would be affected within the reservoir area. Three homes would have to be acquired and removed because of the proposed increase in water level at Lake Success. Public Laws 91-646 and 100-17 require that individuals relocated from Federal projects be compensated for any losses. People who live within the new flowage easements would be eligible for compensation by the Corps or the non-Federal sponsor. Tenants as well as property owners are eligible for compensation. These laws provide for relocation assistance and possibly severance damages.

The Corps owns about 4,178 acres of land near Lake Success, of which 157 acres would be within the proposed increase in gross pool elevation. The affected Corps land does not include the 130.9-acre Boat Island located in Lake Success. An additional 452 acres of private land would be inundated. Most of the private land is grassland; 1.5 acres are citrus orchards. A total of 575 acres of land would also need to be set aside for habitat mitigation.[2] These acres would be managed for wildlife and would be protected in perpetuity.

SCE Project Components

For land use assessment regarding the SCE's Proposed Project, no local land use plans, policies, or regulations requiring discretionary approval would apply to the proposed Project because CPUC has sole and exclusive jurisdiction over the siting and design of the Proposed Project components located in the State of California. Pursuant to CPUC G.O. 131-D, Section XIV.B, "Local jurisdictions acting pursuant to local authority are preempted from regulating electric power line projects, distribution lines, substations, or electric facilities constructed by public utilities subject to the CPUC's jurisdiction." Additionally, utility facilities are considered compatible with agricultural use according to the Tulare County General Plan. Policies relevant to utility lines in the Tulare County General Plan are summarized in Table 3.11-1.

[2] United States Army Corps of Engineers. 1999. Tule River Basin Investigation, California. Final Feasibility Report and Final Environmental Impact Statement. Environmental Impact Report. Sacramento, California. 476 pgs.

Table 3.11-1 – Tulare County General Plan, Policies and Goals

General Plan Policy	Description
PF-6.1 Plans for Jurisdictions, Agencies, District, Utilities, and Native American Tribes	The County shall work with Tulare County cities; adjacent counties and cities; federal, state, and regional agencies; local districts; utility providers; Native American tribes; and the military to ensure that their plans are consistent with Tulare County's General Plan to the greatest extent possible.
PF-6.2 Intergovernmental Coordination	The County shall work with federal, state, and regional agencies; local districts; utility providers; Native American tribes; and the military to ensure that the County and the public are involved, as appropriate, throughout any planning process and that agency and public input is requested.
LU-2.1 Agricultural Lands	The County shall maintain agriculturally designated areas for agriculture use by directing urban development away from valuable agricultural lands to cities, unincorporated communities, hamlets, and planned community areas where public facilities and infrastructure are available.
LU-2.3 Open Space Character	The County shall require that all new development requiring a County discretionary approval, including parcel and subdivision maps, be planned and designed to maintain the scenic open space character of open space resources including, but not limited to, agricultural areas, rangeland, riparian areas, etc., within the view corridors of highways. New development shall use natural landforms and vegetation in the least visually disruptive way possible and use design, construction, and maintenance techniques that minimize the visibility of structures on hilltops, hillsides, ridgelines, steep slopes, and canyons.
PFS-9.3 Transmission Corridors	The County shall work with CPUC and power utilities so that transmission corridors meet the following minimum requirements: 1. Transmission corridors shall be located to avoid health impacts on residential lands and sensitive receptors.

General Plan Policy	Description
	2. Transmission corridors shall not impact the economic use of adjacent properties.
PFS-9.4 Power Transmission Lines	The County shall work with CPUC and power utilities in the siting of transmission lines to avoid interfering with scenic views, historic resources, and areas designated for future urban development.

The proposed Project would have ***less than significant impacts*** on land use since it would not result in land uses that are incompatible with existing and planned land uses in the area, it would not divide an established community, and it would not result in inconsistency with land use designations or goals as set forth in the Tulare County General Plan.

Therefore, the following determinations are made:

CEQA Guidelines Section 15162(a)(1-3)	YES	NO
1. Substantial changes are proposed in the project which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;		✓
2. Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.		✓
3. New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified shows any of the following: a. The project will have one or more significant effects not discussed in the previous EIR;		✓

b. Significant effects previously examined will be substantially more severe than shown in the previous EIR; c. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or d. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.		

Mitigation Measures:

1999 FEIS/FEIR: No mitigation measures pertaining to this topic were identified.

New Mitigation Measures proposed by Lead Agency: No new or additional mitigation measures are necessary.

New Mitigation Measures proposed by SCE (Utility Modifications): No new or additional mitigation measures are necessary.

Cumulative Impacts:

Cumulative land use and planning impacts, such as the potential for conflicts with adjacent land uses and consistency with adopted plans and regulations, are typically site- and project-specific. As discussed above, the proposed Project would not conflict or result in an incompatible use with existing and planned land uses in the area, it would not divide an established community, and it would not result in inconsistency with land use designations or goals as set forth in the Tulare County General Plan. Therefore, the Project's contribution to cumulative land use planning impacts is ***less than cumulatively considerable***.

3.12 Mineral Resources

This section of the SEIR identifies potential impacts of implementing the proposed Project on mineral resources. No NOP comment letters were received pertaining to this topic.

Determination of Adequacy of 1999 FEIS/FEIR

The proposed Project footprint and area of potential effect (APE), as well as the proposed new maximum gross pool elevation raise has not changed since evaluation in the 1999 FEIS/FEIR. The 1999 FEIS/FEIR did not identify any significant impacts associated with mineral resources. However, additional information is being provided herein regarding impacts to mineral resources. Therefore, the following determinations are made:

Topic	Further Analysis Required?	1999 FEIS/FEIR Analysis Sufficient?
a. Would the project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?		✓
b. Would the project result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?		✓

Determination:

The 1999 FEIS/FEIR did not identify any significant impacts regarding mineral resources. Sections 2761(a) and (b) and 2790 of the Surface Mining and Reclamation Act (SMARA) provide for a mineral lands inventory process termed classification-designation. The California Division of Mines and Geology, and the State Mining and Geology Board are the state agencies responsible for administering this process. The primary objective of the process is to provide local agencies, such as cities and counties, with information on the location, need, and importance of minerals within their respective jurisdictions.

Areas are classified on the basis of geologic factors, without regard to existing land use and land ownership. The areas are categorized into four mineral resource zones (MRZs). Of the four categories, lands classified as MRZ-2 are of the greatest importance because they identify significant mineral deposits of a particular commodity. MRZ-3 areas are also of interest because they identify areas that may contain additional resources of economic importance. Areas designated by the Mining and Geology Board as "regionally significant" are incorporated by regulation into Title 14, Division 2 of the California Code of Regulations.

Lake Success is outside of the SMARA study area.[1] Mineral Resource Zone – 2 is on the Tule River, approximately 2.2 miles from the Richard L. Schafer Dam and the Mitchell Brown Engineering, Tule River Pit, an active aggregate producer (mineral resource recovery site), is on the Tule River, approximately 0.75 miles downstream of the Richard L. Schafer Dam.[2] The lake expansion area as a result of Project implementation will not encroach on any established mineral resource zone or mineral resource recovery site, as the nearest known sites are protected by the Richard L. Schafer Dam. Therefore, the following determinations are made:

CEQA Guidelines Section 15162(a)(1-3)	YES	NO
1. Substantial changes are proposed in the project which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;		✓
2. Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.		✓
3. New information of substantial importance, which was not known and could not have been known with the exercise of		✓

[1] California Department of Conservation. Maps and Data. Mineral Hazards. https://maps.conservation.ca.gov/cgs/informationwarehouse/mlc/. Accessed July 2020.
[2] City of Porterville. Planning Division. Mineral Conservation General Plan Map. http://www.ci.porterville.ca.us/depts/communitydevelopment/documents/MineralResourceZones.pdf. Accessed July 2020.

reasonable diligence at the time the previous EIR was certified shows any of the following: a. The project will have one or more significant effects not discussed in the previous EIR; b. Significant effects previously examined will be substantially more severe than shown in the previous EIR; c. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or d. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.		

Mitigation Measures:

1999 FEIS/FEIR: No mitigation measures pertaining to this topic were identified.

New Mitigation Measures proposed by Lead Agency: No new or additional mitigation measures are necessary.

New Mitigation Measures proposed by SCE (Utility Modifications): No new or additional mitigation measures are necessary.

Cumulative Impacts:

The scope for considering cumulative impacts to mineral resources is generally site-specific rather than cumulative in nature. As discussed above, there are no known mineral resources within the Project area and as such, Project implementation would not cumulatively impact any known

mineral resource. While some cumulative impacts may occur in the region as individual projects are constructed, State and federal regulations, as well as local policy documents such as the Tulare County General Plan / EIR and City of Porterville General Plan / EIR will reduce impacts to mineral resources in the region. Therefore, the proposed Project's incremental contribution to cumulative mineral resource impacts would be ***less than cumulatively considerable***.

3.13 Noise

This section of the SEIR identifies potential impacts of implementing the proposed Project relative to generation of noise and vibration. No NOP comment letters were received pertaining to this topic.

Determination of Adequacy of 1999 FEIS/FEIR

The proposed Project footprint and area of potential effect (APE), as well as the proposed new maximum gross pool elevation raise has not changed since evaluation in the 1999 FEIS/FEIR. The 1999 FEIS/FEIR did not identify any significant impacts associated with noise or vibration. However, additional information is being provided herein regarding impacts to from noise and vibration. Therefore, the following determinations are made:

Topic	Further Analysis Required?	1999 FEIS/FEIR Analysis Sufficient?
a. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?		✓
b. Generation of excessive groundborne vibration or groundborne noise levels?		✓
c. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?		✓

Discussion:

Although the 1999 FEIS/FEIR did not identify any significant impacts regarding noise or vibration, the Project is subject to current noise and vibration regulations. Lake Success is vastly surrounded by a natural environment. The nearest sensitive receptors to the spillway

construction area are two residents, located 0.35 and 1.9 miles away, respectively, and local wildlife and recreationists using the reservoir area. Other construction areas associated with the recreation area improvements, Highway 190 bridge abutment protection, and Frazier Dike improvements are located further than 1,000 feet from the nearest sensitive receptor. The nearest sensitive receptors to the SCE Transmission construction areas are approximately 1,000 feet east of the Springville Substation (and associated construction staging area), and approximately 2,000 feet northeast of the Transmission Line right-of-way. However, sensitive receptors are located in proximity to the SCE Distribution poles that will be relocated as part of the Project. The existing noise conditions in the vicinity of the Project site are influenced primarily by surface transportation noise emanating from vehicle traffic on area roadways (e.g., Highway 190 and Highway 65). Noise from surrounding operations (e.g., watercraft on Lake Success), in addition to noise from outdoor activities areas (e.g., people talking, dogs barking, operation of landscaping and agricultural equipment) also contribute, to a lesser extent, to the existing noise environment.

Once the Project is constructed, there will be no new sources of noise that aren't already occurring in the Project area. Thus, operational noise effects are not anticipated. Therefore, the primary direct and indirect effects are related to temporary construction activities.

The Noise Element (10.8) of the 2030 Update, Tulare County General Plan (2012) contains policies designed to accomplish the following goals: to protect the citizens of Tulare County from the harmful effects of exposure of excessive noise, and to protect the economic base of Tulare County by preventing encroachment incompatible land uses near noise-producing industries, railroads, airports and other sources. The Tulare County General Plan limits construction related noise to normal business hours Monday through Saturday (7 a.m. to 7 p.m.). However, the Tulare County General Plan Noise Element (2012) establishes the hourly equivalent continuous sound level (commonly denoted L_{eq}) resulting from the development of new noise-sensitive land uses or new noise-generating sources shall not exceed maximum A-weighted noise level (commonly denoted L_{max}) of 70 dB(A) during the day or 60 dB(A) during the night.

Construction Noise

Noise and vibration impacts would be limited to short-term construction with limits in time and location. Noise and vibration would be generated by heavy equipment during daytime hours. The noise would be limited to the area surrounding the construction sites at the spillway, recreation areas, Transmission Line right-of-way, Distribution Line right-of-way, Frazier Dike, and HWY 190 bridge.

Proposed Project construction-related activities will involve temporary noise sources and are anticipated to begin in 2021 through 2022. Typical construction related equipment associated with the reservoir capacity expansion and SCE Transmission and Distribution Line construction activities are shown in Table 3.13-1.

Table 3.13-1
Typical Construction Equipment Noise Levels

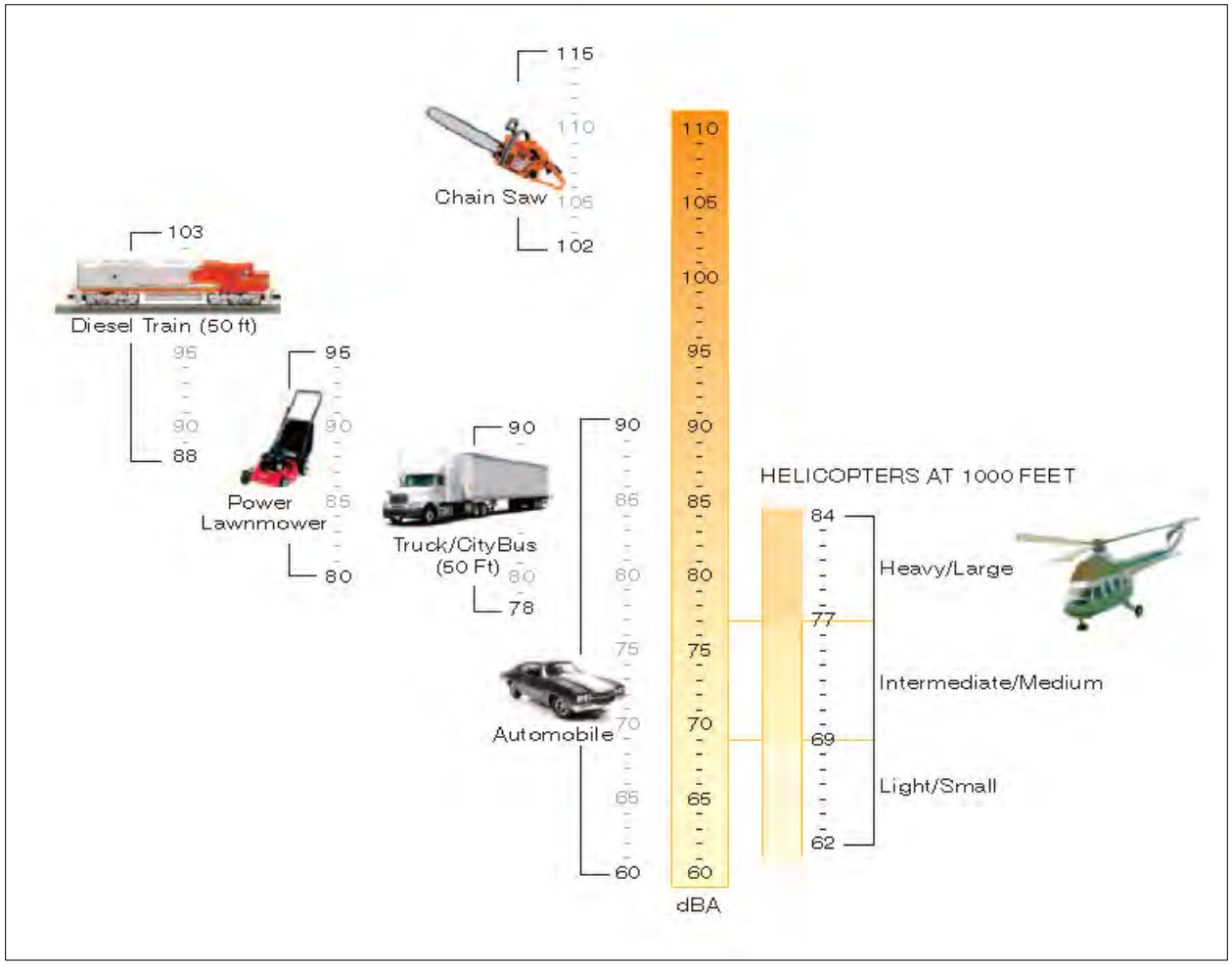
Equipment Description	Specified Lmax at 50 Feet (dBA)
All other equipment greater than 5 horsepower	85
Auger Drill Rig	85
Backhoe	80
Bar Bender	80
Blasting	94
Boring Jack Power Unit	80
Chain Saw	85
Clam Shovel (dropping)	93
Compactor (ground)	80
Compressor (air)	80
Concrete Batch Plant	83
Concrete Mixer Truck	85
Concrete Pump Truck	82
Concrete Saw	90
Crane	85
Dozer	85
Drill Rig Truck	84
Drum Mixer	80
Dump Truck	84
Excavator	85
Flat Bed Truck	84
Front End Loader	80
Generator	82
Gradall	85
Grader	85
Grapple (on backhoe)	85
Horizontal Boring Jack	80
Hydra Break Ram	90
Impact Pile Driver	95
Jackhammer	85

Man Lift	85
Mounted Impact Hammer (hoe ram)	90
Pavement Scarafier	85
Paver	85
Pickup Truck	55
Pneumatic Tools	85
Pumps	77
Refrigerator Unit	82
Rivet Buster/chipping gun	85
Rock Drill	85
Roller	85
Sand Blasting (single nozzle)	85
Scraper	85
Shears (on backhoe)	85
Slurry Plant	78
Slurry Trenching Machine	82
Soil Mix Drill Rig	80
Tractor	84
Vacuum Excavator (vac-truck)	85
Vacuum Street Sweeper	80
Ventilation Fan	85
Vibrating Hopper	85
Vibratory Concrete Mixer	80
Vibratory Pile Driver	95
Warning Horn	85
Welder/Torch	73
Source: FHWA, 2006	

Helicopter Noise

Helicopters may be required to support structure placement, hardware installation, and wire-stringing operations associated with SCE's Transmission and Distribution Line construction activities. Medium-lift helicopters may be used to place structures, while light-duty helicopters would be expected to support the stringing phase of construction. Helicopter operations are expected to be limited to daylight hours. A contractor staging area that may be used to support helicopter activity is located approximately 1,000 feet from the closest residence. Helicopter activities represent a temporary daytime activity. Figure 3.13-1 shows a comparison of noise from helicopters to those of other common construction noise sources at a distance of 1,000 feet. As shown in the Figure, helicopter noise is within the range of other construction equipment associated with the Project.

Figure 3.13-1
Helicopter Noise Comparison



Source: SCE's Proponents Environmental Assessment (July 2020), page 4.12-10

Vibration

The vibration resulting from various pieces of construction equipment was established by the Federal Transit Administration (FTA) as shown in Table 3.13-2. Vibration impact thresholds are not established, however, the California Energy Commission staff in their analysis typically reference the FTA guidance manual criteria for damage (FTA, 2006). In addition to the FTA guidance manual, the Federal Railroad Administration (FRA, 2005, 2012) provides thresholds for various land uses. Both the FTA and FRA provide a methodology for the assessment for potential vibration resulting from rail operations, in addition to potential vibrations from construction activities. Caltrans has also published a "Transportation and Construction Vibration Guidance Manual" (Caltrans, 2013). Caltrans has not established a standard for vibration, rather they present a range of potential criteria. For continuous vibration from traffic, the California Energy

Commission Staff's proposed criteria of a peak particle velocity (PPV) of 0.2 inches per second (in/sec) is indicated in the Caltrans guidance to be "annoying" but not "unpleasant," and a level of 0.1 in/sec is indicated as "Begins to Annoy." It is also noted that "thresholds for perception and annoyance are higher for transient vibration than for continuous vibration." Construction does not represent a continuous source of vibration and is also a short-term and limited to daytime hours; therefore, it is not unreasonable to expect people to be less sensitive to it and for a higher threshold be considered.

Table 3.13-2
Vibration Source Levels for Construction Equipment

Equipment Description	PPV at 25 feet (in/sec)	Approximate Lv at 25 feet*
Hoe Ram	0.089	87
Large bulldozer	0.089	87
Calsson drilling	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58
* RMS velocity in decibels (Vcb) are 1 micro-inch/second		

Table 3.13-2 shows that the for the type of equipment anticipated for this Project, the Peak Particle Velocity (PPV), does not exceed the 0.2 in/sec damage criteria for non-engineered timber or masonry structures. The 2013 Caltrans "Transportation and Construction Vibration Guidance Manual" also refers to a National Cooperative Highway Research Program (NCHRP) report published in September 2012 entitled "Current Practices to Address Construction Vibration and Potential Effects to Historic Buildings Adjacent to Transportation Projects." This document is a contractor's report conducted with funding provided through NCHRP Project 25-25 (Task 72) and provides a "Flow Chart for Recommended Approach for Addressing Construction Vibration Impacts on Historic Buildings" that also references FTA's guidance. This flowchart states that if the project does not include heavy vibration generating equipment (i.e., pile driving, hoe rams, vibratory rollers, and blasting), then vibration is not an issue; or if non-blasting sources of vibration (i.e., pile driving, hoe rams, and vibratory rollers) are at least 500 feet away, then vibration is also not an issue. As the Project does not involve construction equipment that will produce significant vibration impacts within 500 feet of any residences or other sensitive structures, the Project would not result in excessive groundbourne vibration levels.

Determination:

The distinction between short-term construction noise impacts and long-term operational noise impacts is a typical one in both CEQA documents and local noise ordinances, which generally recognize the reality that short-term noise from construction is inevitable and cannot be mitigated beyond a certain level. Thus, local agencies frequently tolerate short-term noise at levels that they would not accept for permanent noise sources. A more severe approach would be impractical and might preclude the kind of construction activities that are to be expected from time to time in public environments. Most residents near public use areas recognize this reality and expect to hear construction activities on occasion.

During the proposed Project construction, noise from construction related activities will contribute to the noise environment in the immediate vicinity. Activities involved in construction will generate maximum noise levels, as indicated in Table 3.13-1, ranging from 73 to 91 dBA at a distance of 50 feet. However, as noted herein, Tulare County does not establish a numeric limit for construction noise, rather it restricts hours of construction when construction activities are near sensitive receptors. In addition, there are no local land use plans, policies, or regulations requiring discretionary approval would apply to SCE's construction activities because, pursuant to G.O. 131-D, the California Public Utilities Commission (CPUC) has sole and exclusive jurisdiction over the siting and design of such facilities. However, mitigation measures and best management practices are included to reduce impacts associated with noise and vibration from construction.

Construction activities would adhere to the allowable construction work hours specified in the mitigation measures, when feasible. In the event that construction activities are necessary on days or hours outside of Tulare County noise requirements (for example, if existing electricity lines must be taken out of service for the work to be performed safely and the line outage must be taken at night for system reliability reasons, or if construction needs require continuous work), SCE would provide 5-day advanced notification, including a general description of the work to be performed, location, and hours of construction anticipated, to any applicable/impacted local jurisdiction and residents within 300 feet of the anticipated work, as well as route all after-hours construction traffic away from residences, schools, and recreational facilities to the maximum extent feasible. These requirements may be waived in the event that emergency and/or potentially unsafe work conditions would be created by limiting construction activities to those hours specified by ordinance. Therefore, no conflicts would occur related to applicable local noise ordinances and the Project would result in noise and vibration impacts that are ***less than significant.***

Therefore, the following determinations are made:

CEQA Guidelines Section 15162(a)(1-3)	YES	NO
1. Substantial changes are proposed in the project which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;		✓
2. Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.		✓
3. New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified shows any of the following: a. The project will have one or more significant effects not discussed in the previous EIR; b. Significant effects previously examined will be substantially more severe than shown in the previous EIR; c. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or d. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant		✓

	effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.		

Mitigation Measures:

The mitigation measures listed below are assigned to either the Lead Agency or SCE. The Lead Agency will be responsible for implementation and compliance with the measures listed under "New Mitigation Measures proposed by Lead Agency" and SCE will be responsible for implementation and compliance with the measures listed under "New Mitigation Measures proposed by SCE (Utility Modifications)".

1999 FEIS/FEIR: No mitigation measures pertaining to this topic were identified.

New Mitigation Measures proposed by Lead Agency:

NOI-1 All contractor construction equipment will comply with Tulare County noise level performance standards (Tulare County 2012). All construction will occur Monday through Saturday between 7 a.m. and 7 p.m.

NOI-2 No construction shall occur on Sundays or national holidays without a permit from the County to minimize noise impacts associated with development near sensitive receptors.

NOI-3 Monitor construction noise for the project duration. The most potentially affected of the four sensitive receptors at the following locations would be selected: residences (two receptors), and the west side recreation area (one receptor), and primary haul routes (two sensitive locations). Summaries of measured noise levels would be provided weekly or more often, if noise complaints arise.

NOI-4 Equip all equipment with noise control devices (e.g., mufflers), in accordance with manufacturers' specifications.

NOI-5 Inspect all equipment periodically to ensure proper maintenance and presence of noise control devices (e.g., lubrication, mufflers that do not leak, and shrouding).

NOI-6 Prevent equipment from idling more than five minutes.

NOI-7 Conspicuously post a 24-hour contact number around the project site, and supply to nearby residents. The disturbance coordinator would receive all public

complaints and be responsible for determining the cause of the complaint and implementing any feasible measures to alleviate the problem.

NOI-8 Encourage the hauling of material along sensitive routes only from 8 AM to 5 PM (daytime hours).

NOI-9 Discourage the use of engine braking ("jake brakes") along sensitive routes.

NOI-10 Encourage truckers to reduce engine noise when shifting in noise sensitive areas, and post these areas.

New Mitigation Measures proposed by SCE (Utility Modifications): No new or additional mitigation measures are required for SCE's scope of work.

Cumulative Impacts

The scope for considering cumulative impacts to noise is generally site-specific rather than cumulative in nature because each project site has different noise considerations that would be subject to review. Impacts from elevated noise only would exist where there are sensitive noise receptors that be adversely affected by exposure to elevated noise. Future development within nearby jurisdictions could increase noise exposure of noise sensitive receptors to elevated noise levels. Construction of the individual development projects allowed under the land use designations of Tulare County's General Plan may result in the generation of site-specific noise increases from stationary noise sources, and may contribute incrementally to noise from mobile sources. Additionally construction noise from individual development projects allowed under Tulare County's General Plan may result in the generation of site-specific noise increases.

As indicated herein, the Project will not result in permanent increases in noise or vibration levels. In addition, temporary construction noise does not constitute a significant impact either at the project-level or cumulative level. Therefore, the proposed Project's incremental contribution to cumulative noise impacts would be ***less than cumulatively considerable***.

3.14 Population and Housing

This section of the SEIR identifies potential impacts of implementing the proposed Project on population and housing. No NOP comment letters were received pertaining to this topic.

Determination of Adequacy of 1999 FEIS/FEIR

The proposed Project footprint and area of potential effect (APE), as well as the proposed new maximum gross pool elevation raise has not changed since evaluation in the 1999 FEIS/FEIR. The 1999 FEIS/FEIR did not identify any significant impacts associated with population and housing. However, additional information is being provided herein regarding impacts to population and housing. Therefore, the following determinations are made:

Topic	Further Analysis Required?	1999 FEIS/FEIR Analysis Sufficient?
a. Would the project induce substantial unplanned population growth in an area, either directly or indirectly?		✓
b. Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?		✓

Discussion:

The 1999 FEIS/FEIR did not identify any significant impacts regarding population and housing. Centrally located within the State of California, Tulare County is situated in a geographically diverse region. Tulare County is one of the largest counties in the San Joaquin Valley. The County includes an area of 4,863 square miles. Mountain peaks of the Sierra Nevada range rise to more than 14,000 feet in its eastern half. Meanwhile, the extensively cultivated and fertile valley floor in the western half has allowed Tulare County to become the third-leading producer of agricultural commodities in the United States (Tulare County Farm Bureau). In addition to substantial packing/shipping operations, light and medium manufacturing plants are increasing in number and are becoming an important factor in the county's total economic picture.

The City of Porterville is located about six miles west of the Richard L. Schafer Dam. The City of Porterville is the focal point of this study as it is the City that is the primary beneficiary of flood protection, recreational use, and water supply provided by Lake Success. As of January 1, 2019, there were 59,145 people and 16,364 housing units within the City of Porterville. The Tule Indian Reservation boundary, which crosses the South Fork of the Tule River, is approximately five miles upstream of the Project area.

The Project will require acquisition of three residences that will be impacted by the raised gross pool elevation. These residences would be removed after acquisition to accommodate the Project. Public Laws 91-646 and 100-17 require that individuals relocated from Federal projects be compensated for any losses. People who live within the new flowage easements would be eligible for compensation by the Corps or the non-Federal sponsor. Tenants as well as property owners are eligible for compensation. These laws provide for relocation assistance and possibly severance damages. A total of 44 privately owned parcels comprising 452 acres around the lake would be impacted by raising the spillway elevation and would be purchased. In limited circumstances, a flowage easement could be used instead of fee title acquisition. The majority of the parcels are owned by five individuals. The City of Porterville currently has a 6.7% vacancy rate in housing units[1] and as such, could provide potential housing options for the three displaced households.

Therefore, the following determinations are made:

CEQA Guidelines Section 15162(a)(1-3)	YES	NO
1. Substantial changes are proposed in the project which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;		✓
2. Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial		✓

[1]Census 2020 California Hard-to-Count Fact Sheet. Porterville City in Tulare County. https://census.ca.gov/wp-content/uploads/sites/4/2019/06/Porterville.pdf

increase in the severity of previously identified significant effects.		
3. New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified shows any of the following: a. The project will have one or more significant effects not discussed in the previous EIR; b. Significant effects previously examined will be substantially more severe than shown in the previous EIR; c. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or d. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.		✓

Mitigation Measures:

1999 FEIS/FEIR: No mitigation measures pertaining to this topic were identified.

New Mitigation Measures proposed by Lead Agency: No new or additional mitigation measures are necessary.

New Mitigation Measures proposed by SCE (Utility Modifications): No new or additional mitigation measures are necessary.

Cumulative Impacts:

The scope for considering cumulative impacts to population and housing are the geographic areas covered by the Tulare County General Plan / EIR, the City of Porterville General Plan / EIR, and as well as all of Tulare County. Tulare County is the boundary for consideration of cumulative impacts on population and housing because land use decisions at the County level involve provisions for housing and most data regarding population and housing is aggregated at the county level. The proposed Project does not include construction of any housing and is not anticipated to induce population growth. The Project will result in the acquisition of three residences, which will be compensated for at market rate value. These effects are not considered cumulatively considerable because there is adequate replacement housing within the City of Porterville and Tulare County. The Project's contribution to cumulative population and housing impacts are ***less than cumulatively considerable***.

3.15 Public Services

This section of the SEIR identifies potential impacts of implementing the proposed Project on public services. No NOP comment letters were received pertaining to this topic.

Determination of Adequacy of 1999 FEIS/FEIR

The proposed Project footprint and study area, as well as the proposed new maximum gross pool elevation raise has not changed since evaluation in the 1999 FEIS/FEIR. The 1999 FEIS/FEIR did not identify any significant impacts associated with public services. However, additional information is being provided herein regarding impacts to public services. Therefore, the following determinations are made:

Topic	Further Analysis Required?	1999 FEIS/FEIR Analysis Sufficient?
a. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services: • Fire protection? • Police protection? • Schools? • Parks? • Other public facilities?		✓

Discussion:

Existing Setting

The proposed Project is located in the western foothills of the Sierra Nevada mountain range approximately 6 miles east of the City of Porterville within unincorporated Tulare County, California. Elevations of the Project site range from 650 to 700 feet above sea level. The area surrounding the proposed Project and Lake Success is characterized by recreation and agricultural land uses, with scattered residences. The Project area is dominated visually by Lake Success and the surrounding grassy hills. Man-made features in the area include the existing roadways, utilities (SCE Transmission and Distribution Lines), the reservoir dam, camping/recreation areas, parking areas and associated improvements. Public services were identified through review of the Tulare County General Plan, school district websites, and aerial imagery.

Police

Police and law enforcement services in the proposed Project study area are provided by the Tulare County Sheriff's Department. According to the 2014-2015 Tulare County Sheriff's Department Annual Report, the department is made up of 592 sworn personnel and 252 support staff. The Patrol Services unit is composed of an Aviation Unit, Boat Patrol, Dive Team, Search and Rescue, and Volunteers.

The nearest Sheriff's Department Substation to the proposed Project is located at 379 North 3rd Street, Porterville, CA 93257. The Porterville Sheriff's Department Substation is approximately 7 miles from Lake Success.

Lake Success is patrolled by the Tulare County Sheriff's Department Boat Patrol. The Sheriff's Department coordinates with nearby emergency services, as needed.

Fire

Fire services in the proposed Project study area are provided by the Tulare County Fire Department and California Department of Forestry and Fire Protection. The Tulare County Fire Department is made up of over 400 Emergency Services personnel. The department responds to approximately 12,000 calls for service each year, mostly involving medical emergencies. The Department's Station #20 is located approximately 4.4 miles from Lake Success Park and the southern extent of the proposed Project, while the Department's Station #22 is located approximately 9 miles from the northern extent of the proposed Project. Addresses are as follows:

- Tulare County Fire Department Station #20: 151 East Success Drive, Porterville, CA 93257
- Tulare County Fire Department Station #22: 35659 Highway 190, Springville, CA 93265

Fire hazards are prevalent in the area due to the rural characteristics of the proposed Project study area. According to the CAL FIRE Fire Hazard Severity Zone map, the proposed Project study area contains moderate and high hazard areas.[1]

Schools

The proposed Project area is within the Porterville Unified School District and Alta Vista Elementary School District. There are no schools located within 2 miles of the proposed Project footprint; however, the proposed Project footprint is within a geography designated for the schools described in Table 3.15-1, Schools.

Table 3.15-1 – Schools in the Project Vicinity[2]

Schools	Address	Approximate Distance from the Proposed Project
Vandalia Elementary School	271 E. College Avenue Porterville, CA 93257	5 miles
Alta Vista Elementary School	2293 E. Crabtree Avenue Porterville, CA 93257	2.5 miles
Citrus South Elementary School	31374 Success Valley Drive Porterville, CA 93257	2.75 miles
Pioneer Middle School	225 E. College Avenue Porterville, CA 93257	5 miles
Porterville High School	465 West Olive Avenue Porterville, CA 93257	5.5 miles
Granite Hills High School	1701 E. Putnam Avenue Porterville, CA 93257	2.75 miles

[1] Cal Fire. Office of the State Fire Marshal. https://osfm.fire.ca.gov/divisions/wildfire-planning-engineering/wildland-hazards-building-codes/fire-hazard-severity-zones-maps/. Accessed July 2020.
[2] Porterville Unified School District. 2018. *School Locator*. http://www.schoolworksgis.com/PUSD/schoollocator.html. Accessed July 2020.

Parks

Bartlett Park, located downstream of Success Dam and approximately 1.5 miles south of the proposed Project, is maintained by the Tulare County Parks and Recreation Department. The park is open to the public year-round and features horseshoe pits, playgrounds, volleyball courts, swings, ponds, a baseball field, picnic areas, and restrooms. Access to Bartlett Park is from Avenue 146, which is identified as an existing paved access road for the proposed Project. Lake Success Park is approximately 1.66 acres and is located near the western shore of Lake Success, just east of Avenue 146.

Hospitals

The nearest hospital to the proposed Project study area is Sierra View Medical Center, located in Porterville, California. Sierra View Medical Center is a 167-bed, full-service acute care facility with a 24-hour emergency department.

Proposed Project

The proposed Project includes modifying the existing spillway by constructing a concrete ogee weir which will increase the gross pool elevation by ten feet, which will in turn increase the existing water storage capacity and increase the reservoir surface area. In addition to reinforcing the Highway 190 bridge abutments and Frazier Dike, the increased pool elevation will require structures and supporting utilities at both the Rocky Hill and Tule Recreation Areas to be relocated or flood protected. Relocated or modified structures include restroom facilities, parking areas, boat ramps, pumphouse facilities, a storage tank, well, and metal shed. SCE's Transmission and Distribution facilities will also need to be replaced and/or modified as a result of the Project. Other than increasing the maximum gross pool elevation, the Project primarily consists of relocation of or modification to existing facilities.

During construction, the need for law enforcement services during construction would be unlikely, except in the event of an emergency or construction material theft. Portions of the proposed Project study area are located in high and moderate Fire Hazard Severity Zones; however, construction activities would be conducted according to standard fire prevention protocols. The need for hospital services may occur during the construction phase of the proposed Project; however, it is anticipated that such a need would occur only occasionally. The temporary and short-term nature of construction of the proposed Project could require a limited amount of accommodations for workers. There may be a need for temporary accommodations such as local hotels or motels; however, it is anticipated that these construction workers would not trigger any

additional demand for services such as schools. The evaluation of potential impacts to parks is provided in Chapter 3.16 of this SEIR.

Operation of the proposed Project would not directly or indirectly induce any population growth or increase for police or fire services, an increase in school enrollment, or an increase use in hospitals or other public facilities that would result in construction of new facilities, impacts on the maintenance of acceptable service ratios, response times, or other performance objectives. Rehabilitation of existing and construction of new access roads conducted as part of the proposed Project has the potential to improve response times for emergency services, particularly in response to wildfires near the proposed Project.

Therefore, the following determinations are made:

CEQA Guidelines Section 15162(a)(1-3)	YES	NO
1. Substantial changes are proposed in the project which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;		✓
2. Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.		✓
3. New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified shows any of the following: a. The project will have one or more significant effects not discussed in the previous EIR; b. Significant effects previously examined will be substantially more severe than shown in the previous EIR;		✓

c. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or d. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.		

Mitigation Measures:

1999 FEIS/FEIR: No mitigation measures pertaining to this topic were identified.

New Mitigation Measures proposed by Lead Agency: No new or additional mitigation measures are necessary.

New Mitigation Measures proposed by SCE (Utility Modifications): No new or additional mitigation measures are necessary.

Cumulative Impacts:

The scope for considering cumulative impacts to public services is generally area-specific rather than cumulative in nature because each project site has different considerations that would be subject to review. The service area for Tulare County's services is considered the cumulative analysis area. Cumulative growth that would occur over the life of the Tulare County General Plan / EIR will result in increased demand for public services. As the demand for public services increases, there will likely be a need to increase staffing and equipment in order to maintain acceptable performance standards. Cumulative impacts to public services are primarily related to other construction projects that could occur during the same time frame as those considered for this Project and within the same vicinity as this Project. Because the Project does not result in significant long-term impacts to public services, the Project's

incremental contribution to cumulative impacts to public services would be ***less than cumulatively considerable***.

3.16 Recreation

This section of the SEIR identifies potential impacts of implementing the proposed Project on recreation. No NOP comment letters were received pertaining to this topic.

Determination of Adequacy of 1999 FEIS/FEIR

The proposed Project footprint and area of potential effect (APE), as well as the proposed new maximum gross pool elevation raise has not changed since evaluation in the 1999 FEIS/FEIR. The 1999 FEIS/FEIR did not identify any significant impacts to recreational facilities. However, additional information is being provided herein regarding potential impacts to recreational facilities. Therefore, the following determinations are made:

Topic	Further Analysis Required?	1999 FEIS/FEIR Analysis Sufficient?
a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?		✓
b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?		✓

Discussion:

The 1999 FEIS/FEIR did not identify any significant impacts regarding impacts to recreation, however, the proposed Project provides some design modifications and additional improvements to recreational facilities. Raising the gross pool causes the need for structures and supporting utilities at both the Rocky Hill and Tule Recreation Areas to be relocated or flood protected. The southern boat launching ramp at the Tule Recreation Area would not be relocated, but extended and widened, to match the existing ramp to ensure use at the new gross pool elevation. The northern parking area at the Tule Recreation Area would be expanded adjacent to the extended boat ramp to mitigate for the seasonal inundation of the southern parking lot. The

expansion would be approximately 250 feet by 450 feet, providing additional space for approximately 50 automobiles and 50 automobiles with trailers. Parking at the Tule Recreation Area is presently filled to capacity during busy weekends and holidays, causing some visitors to park vehicles in a hazardous manner on the narrow shoulder of nearby state Highway 190. The replacement parking area would help alleviate this hazard.

The Corps would protect in place the existing pumphouse and storage tank at the Tule Recreational Area by building a 3.5-foot tall earthen berm (Figure 3.16-1). The restroom immediately west of the pumphouse would be periodically inundated by the new, higher lake levels and would be relocated further away from the water (Figure 3.16-2). In addition, portable toilets would be placed on higher ground when the lower elevation restroom is inundated.

Figure 3.16-1: Proposed 3.5-foot Tall Earthen Berm to Protect Tule Recreation Area Pumphouse

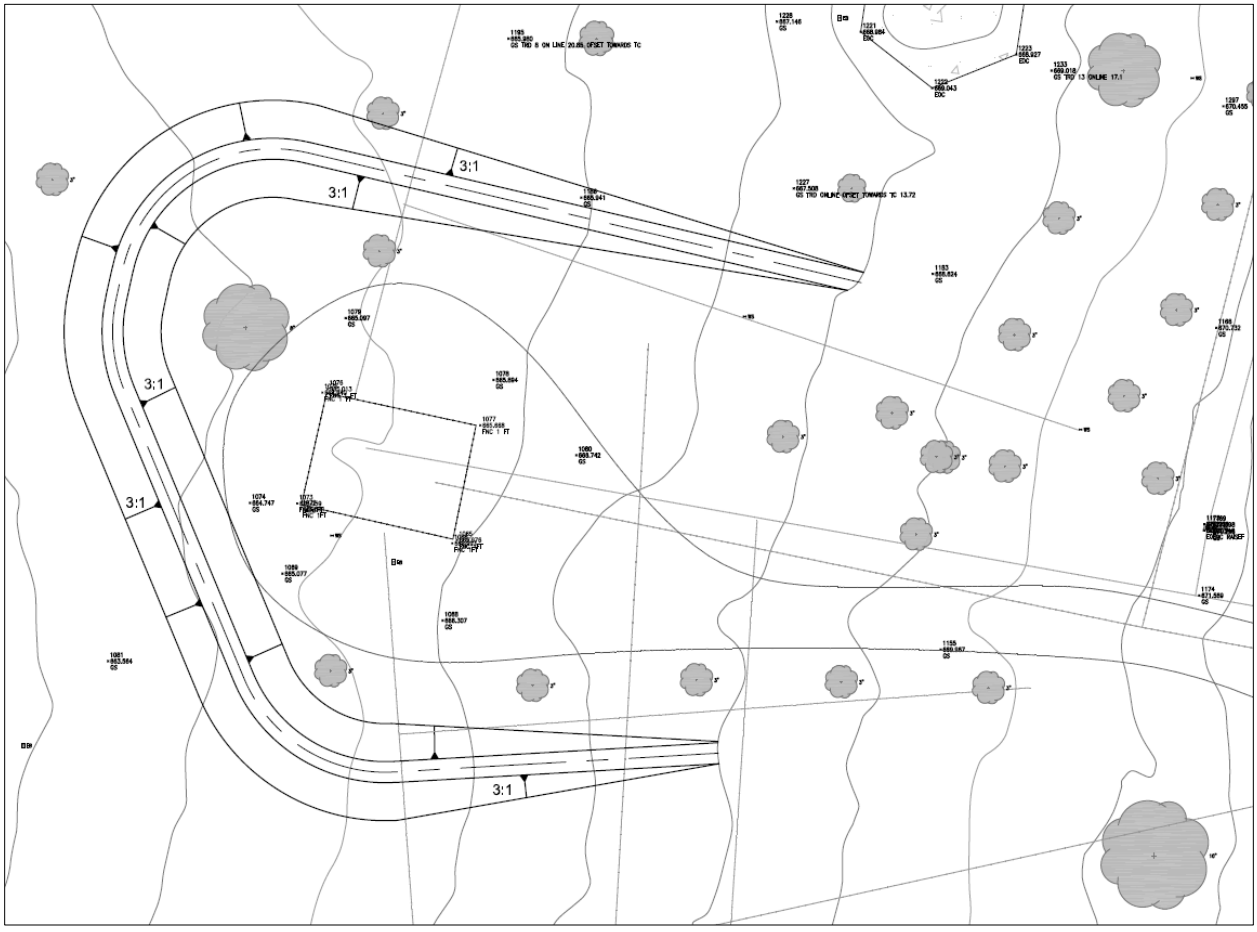
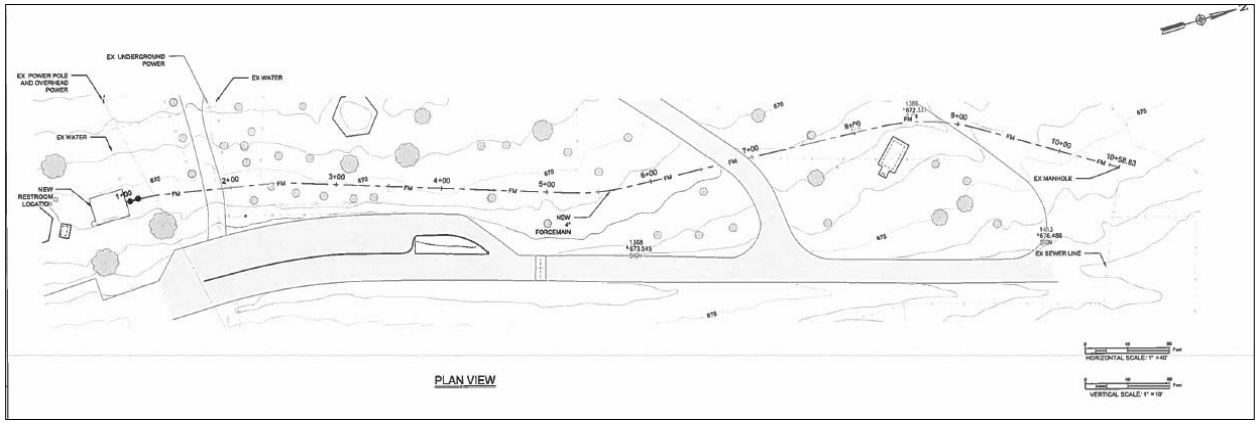


Figure 3.16-2: Location of New Sewer Main for Relocated Tule Recreation Area Restroom



At the Rocky Hill Recreational Area, the pumphouse, storage tank, well, metal shed and boat ramp would need to be relocated or modified to withstand the new gross pool levels. Located on the western side of Lake Success, the pumphouse, storage tank, well, and metal shed would be relocated (Figure 3.16-3) to higher elevation on Corps property. The boat launching ramp would not be relocated, but extended and widened, to match the existing ramp and ensure use at the new gross pool elevation. For access and use during higher gross pool levels, the road to Rocky Hill Recreational Area would be relocated (completed during Phase 1) and the existing parking lot would be enlarged. The existing restroom in the Rocky Hill Recreational Area would be protected in place so that it can be inundated periodically by the new gross pool and then cleaned after the pool recedes. Electrical lines needed for the restroom would be replaced as necessary. The Corps has no provisions to replace picnic areas and instead, picnicking areas would be reconditioned following seasonal flooding. A total of 30 family and six group picnic sites would be subject to seasonal inundation under the proposed Project.

Figure 3.16-3: Location of Relocated Pumphouse in Rocky Hill Recreation Area

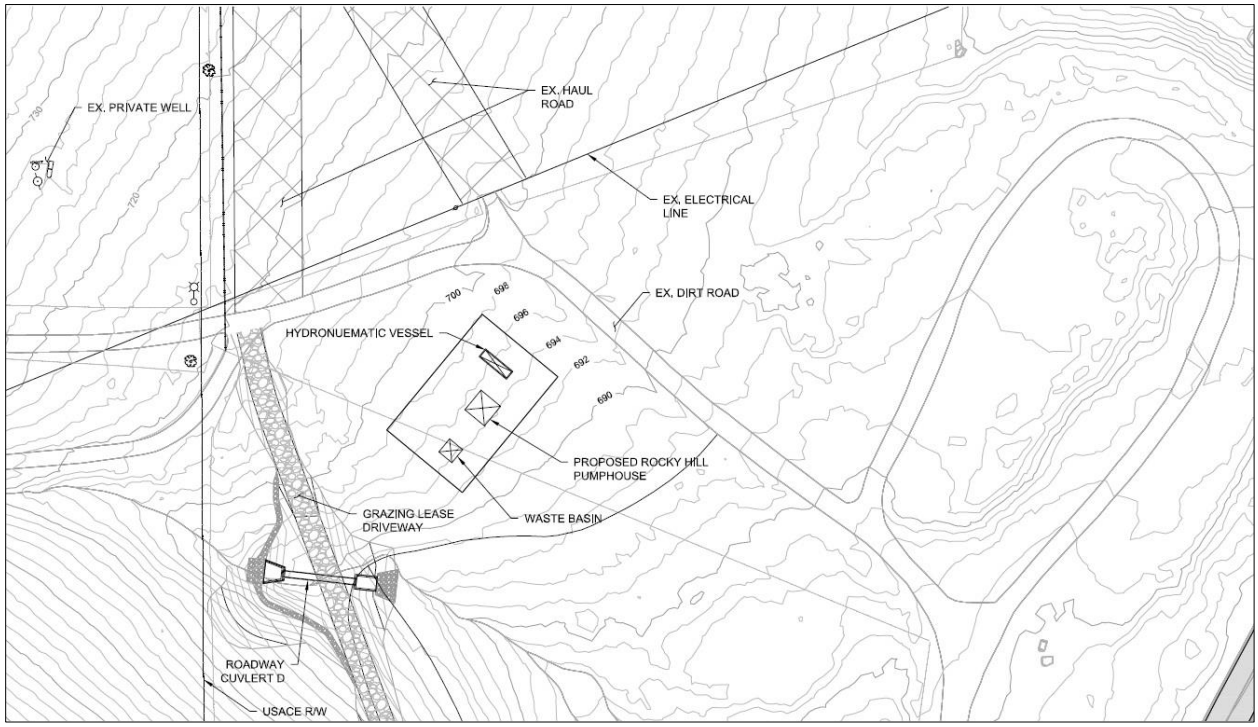


Table 3.16-1 shows a comparison of recreational facility modifications proposed in the 1999 FEIS/FEIR versus the proposed Project.

Table 3.16-1
Comparison of Recreational Facility Modifications

Facility	1999 FEIS/FEIR	Proposed Project
Tule Recreation Area	• Flood-proof two restrooms • Widen/extend boat ramp • Enlarge parking lot • Protect and/or relocate water and sewer systems	• Flood-proof one restroom and relocate one restroom • Widen/extend boat ramp • Enlarge parking lot • Protect water and sewer systems (no relocation)
Rocky Hill Recreation Area	• Flood-proof one restroom • Relocate water well, storage tank and metal shed	• Flood-proof one restroom • Relocate water well, storage tank and metal shed

		• Widen/extend boat ramp (Note: this boat ramp did not exist when the 1999 FEIS/FEIR was prepared, it was installed in the intervening years. It will be widened and extended to accommodate the raised gross pool).
Picnic Areas	• Loss of 30 family and 6 group picnic sites due to innundation. Sites will be reconditioned following seasonal flooding (if applicable).	• Loss of 30 family and 6 group picnic sites due to innundation. Sites will be reconditioned following seasonal flooding (if applicable).

As shown in Table 3.16-1, the modifications to recreational facilities under the proposed Project are substantially the same as what was analyzed in the 1999 FEIS/FEIR. The updated modifications consist of the following:

- Tule Recreation Area – the proposed Project will relocate one of the restrooms instead of providing flood-proofing measures.
- Rocky Hill Recreation Area – the proposed Project will widen/extend the existing boat ramp. As indicated in the table, this boat ramp did not exist when the 1999 FEIS/FEIR was prepared, as it was installed subsequent to that analysis. The proposed Project will widen and extend the existing boat ramp to accommodate the raised gross pool.

These minor modifications do not change the previous determination of "less than significant impacts" pertaining to recreational facilities. These activities are included in the environmental impact analysis of this current SEIR (Impact Sections 3.1 – 3.20) and any impacts and mitigation measures identified within this document also apply to these activities. Therefore, the following determinations are made:

CEQA Guidelines Section 15162(a)(1-3)	YES	NO
1. Substantial changes are proposed in the project which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;		✓
2. Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.		✓
3. New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified shows any of the following: a. The project will have one or more significant effects not discussed in the previous EIR; b. Significant effects previously examined will be substantially more severe than shown in the previous EIR; c. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or d. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project		✓

proponents decline to adopt the mitigation measure or alternative.		

Mitigation Measures:

The mitigation measures listed below are assigned to either the Lead Agency or SCE. The Lead Agency will be responsible for implementation and compliance with the measures listed under "New Mitigation Measures proposed by Lead Agency" and SCE will be responsible for implementation and compliance with the measures listed under "New Mitigation Measures proposed by SCE (Utility Modifications)".

1999 FEIS/FEIR: No mitigation measures pertaining to this topic were identified.

New Mitigation Measures proposed by Lead Agency:

REC-1 The construction contractor shall coordinate public announcement of construction schedule with local residents.

REC-2 The construction contractor shall ensure that temporary passage for residents and recreation is available during construction.

New Mitigation Measures proposed by SCE (Utility Modifications):

SCE REC-1 The public shall be notified of limited access to recreation facilities during construction and replacement of the transmission line. Notification shall include posting signage at areas to be closed and at Lake Success entrances, consistent with Lake Success safety guidelines, prior to construction activities.

Cumulative Impacts:

The scope for considering cumulative impacts to recreational facilities is generally area-specific rather than cumulative in nature because each project site has different recreational considerations that would be subject to review. The service area for Tulare County's recreational services is considered the cumulative analysis area. Cumulative growth that would occur over the life of the Tulare County General Plan / EIR will result in increased

demand for public services, including parks and recreational services. As the demand for recreation increases, there will likely be a need to increase staffing and equipment in order to maintain acceptable performance standards. The Project itself will enhance some recreational facilities associate with Lake Success. However, the proposed Project would have temporary impacts on recreation, due to potential temporary road closures accessing the Rocky Hill Recreation Area for construction activities. Cumulative impacts to recreation are primarily related to other construction projects that could occur during the same time frame as those considered for this Project and within the same vicinity as this Project. Temporary construction effects would be minimized through traffic control and coordination with the public and recreation agencies ensuring that any residual effects would be minimized. All obstacles and hazards to recreational users would be clearly identified by signs, flagging, and buoys. Because the Project does not result in significant long-term impacts to recreational facilities, the Project's incremental contribution to cumulative impacts to recreation would be ***less than cumulatively considerable***.

3.17 Transportation

This section of the SEIR identifies potential impacts of implementing the proposed Project on transportation. No NOP comment letters were received pertaining to this topic.

Determination of Adequacy of 1999 FEIS/FEIR

The proposed Project footprint and area of potential effect (APE), as well as the proposed new maximum gross pool elevation raise has not changed since evaluation in the 1999 FEIS/FEIR. The 1999 FEIS/FEIR did not identify any significant impacts associated with transportation. However, additional information is being provided herein regarding potential impacts to transportation. Therefore, the following determinations are made:

Topic	Further Analysis Required?	1999 FEIS/FEIR Analysis Sufficient?
a. Would the project conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?		✓
b. Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?		✓
c. Would the project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?		✓
d. Would the project result in inadequate emergency access?		✓

Discussion:

The 1999 FEIS/FEIR determined that no impacts to transportation were expected. State Route 190 is a lightly traveled highway going from Porterville, along Lake Success, to Springville and Eagle Mountain Casino. The casino, whose entrance is about 10 miles north of Lake Success, is operated on the Tule Indian Reservation. Highway 190 is the primary access for the casino, especially on

weekends. Springville, with a population of approximately 1,100, is residence to many commuters who travel State Route 190 to Porterville during the week. Worth Drive/Avenue 146 also connects the City of Porterville to Richard L. Schafer Dam at the southern end of the reservoir. This segment of Worth Drive/Avenue 146 is utilized by residents of two households and support 80,000 visitor days to the Rocky Hill Recreation Area. The Lake Success Recreation Area is accessible from the town of Strathmore via Avenue 196 to Avenue 176.

The proposed Project would result in a short-term increase in construction traffic on public roadways. After construction is complete, traffic and transportation resources are expected to resume normal operating conditions. Thus, potential transportation impacts pertain to temporary construction activities. The main haul route to Frazier Dike would go through Corps property and avoid public roads. The haul route to the Highway 190 bridge would follow Highway190. Armoring the bridge abutments could cause traffic delays in the area of the bridge. The spillway raise component of the Project would not impede traffic on Worth Drive/Avenue 146 during the ogee weir construction.

The Contractor would be responsible for preparing a Traffic Control Plan to minimize traffic flow interference from construction activities. The Plan would include appropriate placement of signs, flaggers, barricades, and traffic delineation to minimize disruption and ensure public safety. The Contractor would also be responsible for coordination with Tulare County, the City of Porterville, Caltrans, and other responsible agencies to reduce adverse effects on traffic (to include the development and implementation of a traffic mitigation plan). Additionally, the Contractor would be responsible for obtaining all applicable permits (including a Construction Encroachment Permit for work that would be performed on the public ROW). Although there would be an increase in traffic in the Project area during construction, this increase would be short-term and would be reduced to less than significant levels with implementation of mitigation measures.

Rock Revetment (Riprap) for Highway 190 Bridge Abutments

The 1999 FEIS/FEIR evaluated the installation of rock revetment (riprap) along the bridge abutments of Highway 190 for erosion protection above the existing rock revetment. Approximately 3,000 linear feet of riprap, bedding, and filter material would be placed to 669 feet elevation (NAVD88). Figure 2-7 in Chapter Two – Project Description shows the typical cross-section for rock revetment (riprap) placement. With implementation of this Project feature, impacts to the bridge are considered less than significant.

SCE Project Components

Construction of SCE's Project components is anticipated to take approximately 12-17 months to complete and would result in a temporary increase in local traffic as a result of construction-related workforce traffic, and equipment and material deliveries. All the construction activities will occur outside of the public ROW, and no road closures are expected for transmission construction; however, short-term, temporary road or lane closures could be required for distribution line construction.

Traffic-generating construction activities would consist of the daily arrival and departure of construction workers to the staging areas near the Springville Substation, as well as trucks hauling equipment and materials to the staging areas, and in some cases, directly to the work areas. SCE anticipates a total of 45 construction personnel working on any given day, resulting in a maximum of 45 daily roundtrips (90 one-way trips). Crews would work concurrently whenever possible; however, the estimated deployment and number of crew members would vary depending on factors such as material availability, resource availability, and construction scheduling. Carpooling will be encouraged; however, this maximum number has been used as a conservative analysis. Crews will park personal vehicles at staging yards prior to deployment to work areas in construction vehicles.

Construction activities are also anticipated to generate up to an estimated 22 truck trips per day. For this analysis, the truck trips were converted to passenger car equivalent trips at a ratio of 1.5 passenger cars for each truck, consistent with the Highway Capacity Manual 2010 guidelines (Transportation Research Board, 2010).

It is anticipated that construction crews will stay overnight in the City of Porterville, and most of the construction-related trips (vehicle and truck trips) would occur on the roadways between the Project sites and the Project construction staging areas. Within the City of Porterville, the construction-related traffic would be distributed across the regional and local road network.

Tulare County Association of Governments (TCAG), the County's congestion management agency, has established a threshold of Level of Service (LOS) D for urban areas and LOS C for rural areas. As described previously, Project construction would result in a temporary minimal increase in local traffic from construction-related workforce traffic and material deliveries. The Project-added trips represent a minimal increase in traffic compared to the existing roadway volumes, and no changes to the existing LOS are anticipated.

The Office of Planning and Research released a Technical Advisory on Evaluating Transportation Impacts in CEQA in December, 2018.[1] In that Technical Advisory, a "screening threshold" of 110 trips per day was suggested to allow lead agencies to quickly identify when a project should be expected to generate a less than significant impact with regards to vehicle miles traveled (VMT). As the proposed Project is expected to generate less than 110 trips per day, the Project will not generate significant amounts of VMT. Construction-related effects of the proposed Project on traffic patterns would be ***less than significant***

Therefore, the following determinations are made:

CEQA Guidelines Section 15162(a)(1-3)	**YES**	**NO**
1. Substantial changes are proposed in the project which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;		✓
2. Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.		✓
3. New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified shows any of the following: a. The project will have one or more significant effects not discussed in the previous EIR; b. Significant effects previously examined will be substantially more severe than shown in the previous EIR;		✓

[1] California Office of Planning and Research. https://www.opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf. Page 12. Accessed August 2020.

c. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or d. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.		

Mitigation Measures:

The mitigation measures listed below are assigned to either the Lead Agency or SCE. The Lead Agency will be responsible for implementation and compliance with the measures listed under "New Mitigation Measures proposed by Lead Agency" and SCE will be responsible for implementation and compliance with the measures listed under "New Mitigation Measures proposed by SCE (Utility Modifications)".

1999 FEIS/FEIR: No mitigation measures pertaining to this topic were identified.

New Mitigation Measures proposed by Lead Agency:

TRA-1 The construction contractor shall coordinate with affected residents and the landowners prior to construction.

TRA-2 The construction contractor shall place proper signage to warn and direct traffic, including signalmen, if necessary.

TRA-3 The construction contractor shall ensure that temporary passage for residents and recreation is available during construction.

New Mitigation Measures proposed by SCE (Utility Modifications): No new or additional mitigation measures are necessary.

Cumulative Impacts:

The scope for considering cumulative impacts can be both site-specific and/or cumulative in nature, depending on the extent of impacts resulting from project implementation. Construction of the proposed Project could overlap with the construction activities of other local projects that could result in short-term cumulative traffic level increases on some local and regional roadways. It is expected that traffic impacts from projects in the City of Porterville would be similar to the proposed Project in that impacts would be primarily from construction-related vehicles and material hauling to and from project sites. As indicated above, the Project will require coordination with various agencies pertaining to maintaining acceptable vehicular access in areas impacted by Project construction and once construction is complete, existing traffic patterns will remain. As such, the Project's impacts on transportation and traffic would be ***less than cumulatively considerable.***

3.18 Tribal Cultural Resources

This section of the SEIR evaluates the potential impacts to Tribal Cultural Resources (TCRs) associated with implementation of the proposed Project. No NOP comments were received pertaining to Tribal Cultural Resources.

Determination of Adequacy of 1999 FEIS/FEIR

The proposed Project footprint and area of potential effect (APE) has not changed since evaluation in the 1999 FEIS/FEIR. However, the CEQA Guidelines have been updated to include questions related to impacts to tribal cultural resources. Therefore, the following determinations are made:

Topic	Further Analysis Required?	1999 FEIS/FEIR Analysis Sufficient?
a. Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is: i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code section 5024.1. In applying the criteria set forth in subdivision (c) of the Public Resources Code section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	✓	

Discussion:

Because impacts to tribal cultural resources was not evaluated in the 1999 FEIS/FEIR, this SEIR evaluates potential Project-related impacts to tribal cultural resources.

Environmental Setting

The Project APE consists of the potential temporary or permanent disturbance areas identified in Chapter Two – Project Description, which consists of the areas of land surrounding Lake Success that will be impacted by the raised water level, including the associated improvements/modifications to the existing spillway, Highway 190 Bridge, Frazier Dike, recreational facilities, and associated stockpile/staging areas (Figures 2-1, 2-2, 2-3, 2-6, 2-8, 2-11, 2-12 and 2-13). The APE also encompasses the activities proposed by SCE for transmission and distribution modifications (Figures 2-14 and 2-15).

A Tribal Cultural Resource (TCR) is defined under Public Resources Code section 21074 as a site, feature, place, cultural landscape that is geographically defined in terms of size and scope, sacred place, and object with cultural value to a California Native American tribe that are either included and that is listed or eligible for inclusion in the California Register of Historic Resources or in a local register of historical resources.

Cultural resources are broadly defined as buildings, structures, objects, sites, districts, and archeological resources associated with human activity in prehistory or history. For the purposes of the current assessment, "prehistory" refers to a time period prior to the arrival of Spanish and other Euro-American explorers and settlers into the project area, when the area was inhabited only by Native American peoples, described below as the Prehistoric Setting.

Prehistoric Setting. Radiometric dating techniques place human habitation along portions of coastal California to well before 12,000 years ago. Areas along the shoreline of ancient Tulare Lake, in Kings County, also show evidence of early Holocene occupation, dating to 8,000 years before present (BP) or earlier. Based on archaeological and linguistic evidence, Native Americans ancestral to present-day Yokuts tribes lived the area around present-day Lake Success for 5,000 to 7,000 years. This area, where several forks of the Tule River converge, provided a rich base for human subsistence and permanent and semi-permanent settlements. Native American peoples occupying this region employed an economic strategy involving seasonal rounds, with the valley, foothills, and higher elevations of the Sierra Nevada range offering a wide variety of plant, animal, and other resources.

Beginning around 3,000 years ago, acorns increasingly gained dietary importance throughout California, and archaeological evidence indicates they were a staple of the local diet by 2,000-1,500 years BP. In the southern San Joaquin Valley and foothills, intensification of plant use and increased residential mobility is seen as corresponding with a period of widespread climate change in California around 1000 years ago, known as the Medieval Climatic Anomaly.

After around 800 years ago, land use practices again centered on permanent or semi-permanent villages. In the current project area this pattern likely continued to the contact period. Previous archaeological work around Lake Success has located several prehistoric sites, many of which comprise bedrock milling features used for processing acorns and other plant and mineral resources. While the cultural sequence within the project area remains relatively undefined, in general the prehistoric record suggests relatively high population densities (Berryman and Elsasser 1966:7).

Occasional European intrusion into the area began around A.D. 1772, but the absence of Spanish missions in the lower San Joaquin Valley somewhat limited early contact between native and non-native peoples. By way of example, the malaria epidemic of 1833, which devastated the northern San Joaquin Valley, appears not to have penetrated into the nearby Tulare Valley (Phillips 1993:94). Native American populations who escaped decimation by disease in this region were able to maintain seasonal rounds and trade contacts into the late nineteenth and early twentieth centuries.

Native American Ethno-history. The current Project area is located near the convergence of the Southern Valley and the Foothill Yokuts territories. The territory of the larger Southern Valley Yokuts reportedly extended from the Coastal Ranges to the west, Fresno to the North, the Tehachapi Foothills in the south and into the Sierra Foothills to the east almost to the current Tule River Indian Reservation. Of the Southern Valley Yokuts, the Koyeti lived along the lower Tule River, with several ethno-historic Koyeti situated along the Tule River in the vicinity of the Porterville. These included the Chokowisho, Tenalu, and Chetetik Nowsuh (Reddy et al. 2008:2.8).

Foothill Yokuts territory is thought to have covered a much smaller area consisting of fragmented areas around the Tule, Kings, San Joaquin, Fresno, Kaweah, and Poso Rivers. Foothill Yokuts Tribes located closest to Success Valley included the Yawdanchi near the North Fork of the Tule River and the Hoeynche situated along the South Fork of the Tule River. While the Project area is within known Yokuts boundaries, trade and interaction with other ethnically and linguistically distinct tribes, such as the Mono and Tübatulabal, was common.

In the 1850s, some Yokuts peoples, especially Foothill Yokuts, labored at agriculture on the Tule River Farm near the town of Porterville (Reddy et al. 2008). In 1864, the Tule River Farm became the Tule River Indian Reservation. In 1873, the reservation of the government-reformulated Tule River Tribe, now consisting of Yokuts, Mono, and Tübatulabal members, was re-located to a more mountainous, less economically-productive, area approximately 15 miles to the east and upslope from Porterville. Cultural resources dating to the ethno-historic period may be present in the Project area.

Historic-era Setting. The first documented contact between indigenous groups of the area and Europeans was in 1772, when Spanish explorers with the Fages party entered the region. Contact was largely limited in the following decades, until the early 19th century when the Spanish government and the Catholic Church began sending missionization expeditions into the southern San Joaquin Valley. These efforts to missionize the local Yokuts were not particularly successful. Conflicts between the European and native populations during the Mexican period of California history were more frequent than in the preceding period (Wallace 1978: 459-460).

Gold was discovered in the early 1850s east of the Success Valley in the Globe District and on Cow Mountain. In subsequent years, several gold and silver claims were staked in these areas, albeit with limited success. In 1859, the location of Porterville was established by Porter Putnam as a spot for his hotel and store. Both of the enterprises were built to service overland stagecoach traffic between San Francisco and Los Angeles. The town site also was an important supply stop along the route from the valley to gold mines northeast in the Sierra Nevada.

Even though gold and silver mining in Tulare County was not hugely successful, magnesite mining did later have an economic impact on the region. Magnesite deposits in the Porterville area were first discovered by W. P. Blake in 1853 during a U.S. expedition and survey for a railroad. Extraction of magnesite in the region did not begin in earnest until the early part the 1900s, following restrictions on foreign shipments of this mineral during European wars. At this time, the entire domestic production of magnesite was from California, with the vast majority of the mineral extracted from Tulare County in the areas around Porterville, Success, and Lindsay.

Although mining continued in subsequent decades to be a major industry in the San Joaquin Valley, agriculture and ranching also grew in economic importance, with large herds of cattle and sheep brought into the valley to graze. Ranching and agriculture continued to be primary sources of revenue for families in the Success Valley well into the 20th century. The establishment of agriculture and ranching in the Success Valley prompted several irrigation projects to be undertaken. One of the most notable of these near the Lake Success Project area was the Pioneer Ditch. The Pioneer Ditch was dug over a seven year period between 1860 and 1867 to provide

water a local flour mill, reduce flood damage, and later to turn turbines for electricity production for Porterville (Meighan et al. 1988).

In addition to irrigation, another major contributor to the success of the agricultural industry was rail transportation of goods and livestock to markets outside the region. The Southern Pacific Railroad was the first to reach Porterville in 1888. As a result, the town underwent a population increase, as well as an increase in exported fruit production and, to a lesser extent, other crops including raisins, grapes, and lemons (Reddy et al. 2008).

Construction of Richard L. Schafer Dam began in 1958 and was completed on May 15, 1961. The dam provides flood risk reduction benefits to the city of Porterville and other communities downstream of the dam. In addition, the dam helps protect several hundred thousand acres of valuable farmland to the west of the dam from damaging winter and spring floods. In 1999, during preparation of the Tule River Basin Investigation Feasibility Study and FEIS/FEIR (Corps 1999), Richard L. Schafer Dam was evaluated for historic significance and determined not eligible for inclusion on the National Register of Historic Places (NRHP), with consensus from the California State Historic Preservation Officer (SHPO) (October 15,1999 [COE990720A]). Given the passage of time since that previous determination, through correspondence dated September 18, 2019, the Corps reinitiated consultation with the SHPO regarding the determination that Richard L. Schafer Dam is not eligible for inclusion in the NRHP. The SHPO concurred with that determination through correspondence dated November 5, 2019.

Regulatory Setting

Assembly Bill (AB) 52

AB 52, which was approved in September 2014 and became effective on July 1, 2015, requires that CEQA lead agencies consult with a California Native American tribe that is traditionally and culturally affiliated with the geographic area of a proposed project, if requested by the tribe. A provision of the bill, chaptered in CEQA Section 21086.21, also specifies that a project with an effect that may cause a substantial adverse change in the significance of a TCR is a project that may have a significant effect on the environment.

Defined in Section 21074(a) of the Public Resources Code, TCRs are:

1. Sites, features, places, cultural landscapes, sacred places and objects with cultural value to a California Native American tribe that are either of the following:

a. Included or determined to be eligible for inclusion in the California Register of Historical Resources; or

b. Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1.

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

TCRs are further defined under Section 21074 as follows:

a. A cultural landscape that meets the criteria of subdivision (a) is a TCR to the extent that the landscape is geographically defined in terms of the size and scope of the landscape; and

b. A historical resource described in Section 21084.1, a unique archaeological resource as defined in subdivision (g) of Section 21083.2, or a "non-unique archaeological resource" as defined in subdivision (h) of Section 21083.2 may also be a TCR if it conforms with the criteria of subdivision (a).

Mitigation measures for TCRs must be developed in consultation with the affected California Native American tribe pursuant to newly chaptered Section 21080.3.2, or according to Section 21084.3. Section 21084.3 identifies mitigation measures that include avoidance and preservation of TCRs and treating TRCs with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource.

California Senate Bill 18

Senate Bill 18 was enacted in 2004 in order to "establish meaningful [government-to-government] consultations between California Native American tribal governments and California local governments at the earliest possible point in the local government land use planning process so that these places [referring to tribal cultural places] can be identified and considered" (Chapter 905, Statutes of 2004).

Senate Bill 18 outlines the mandatory government-to-government consultation process. It defines the role of local governments within this process and includes a timeframe for communication with California Native American tribes, which is to occur prior to the adoption or amendment of

any general plan or open-space designation (Government Code, Sections 65352.3, 65562.5). To assist with compliance, the Office of Historic Preservation has produced a set of Tribal Consultation Guidelines (2005).

National Historic Preservation Act of 1966

The National Historic Preservation Act (NHPA) of 1966, as amended (54 U.S.C. § 300101 et seq.), is the primary Federal legislation governing the preservation and protection of significant cultural resources. Title 54 U.S.C. § 306108, formerly and commonly known as Section 106 of the NHPA, requires Federal agencies to take into account the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment with regard to such undertakings. Undertakings are projects, activities, or programs funded in whole or in part under the direct or indirect jurisdiction of a Federal agency (54 U.S.C. § 300320). Historic properties are cultural resources that are included on, or eligible for inclusion on, the NRHP (54 U.S.C. § 300308).

Thresholds of Significance

The thresholds of significance for this section are established by the CEQA Checklist Item.

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

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

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

Impacts and Mitigation Measures

Impact 3.18-1: *Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape*

that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

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

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

Less Than Significant. A Tribal Cultural Resource (TCR) is defined under Public Resources Code section 21074 as a site, feature, place, cultural landscape that is geographically defined in terms of size and scope, sacred place, and object with cultural value to a California Native American tribe that are either included and that is listed or eligible for inclusion in the California Register of Historic Resources or in a local register of historical resources. As discussed herein, under Section 3.5 - Cultural Resources, criteria (b) and (d), no known archeological resources, ethnographic sites or Native American remains are located on the proposed Project site. As discussed under criterion (b), implementation of mitigation measures would reduce impacts to unknown archaeological deposits, including TCRs, to a less than significant level. As discussed under criterion (d), compliance with California Health and Safety Code Section 7050.5 would reduce the likelihood of disturbing or discovering human remains, including those of Native Americans.

As further described in Section 3.5 – Cultural Resources, the Corps has completed efforts to identify and evaluate historic properties in the APE for the Project; however, as described at 36 CFR § 800.1(c), the Corps must complete the Section 106 process for the entire undertaking, comprising all phases of the proposed Project, prior to approving the expenditure funds for the proposed actions covered under this SEIR. Given the extensive nature of the combined APE for all phases of the undertaking, which includes more than 300 acres on both public and private lands surrounding Lake Success, a phased approach to Section 106 compliance for the undertaking is required. In accordance with 36 CFR § 800.4(b)(2), in order to phase the identification and evaluation of historic properties under Section 106, execution of a Programmatic Agreement is required, pursuant to 36 CFR § 800.14(b)(1)(ii).

Ahead of the Tule River Basin Investigation Feasibility Study and 1999 FEIS/FEIR, initial efforts to identify historic properties in the Project area were conducted. Section 106 identification efforts

at that time consisted of archival research and cultural resources pedestrian surveys completed by the Institute of Archaeology at the University of California, Los Angeles (Meighan 1988). Nine prehistoric and two historic-era cultural resources were identified during those survey efforts, one of which—a bedrock milling station recorded as CA-TUL-971—was determined eligible for the NRHP (SHPO letter of July 12, 2002 [COE020423A]). That historic property is outside the APE for all phases of the Tule River Spillway Enlargement Project.

Additional historic properties' identification efforts covering portions of the Project APE have been completed since the certification of the 1999 FEIS/FEIR (e.g., Meighan et al. 1988; Reddy 2008; O'Day and Pfertsh 2017). With the exception of one historic-era resource (CA-TUL-970), identified as the Tulare Mining Company Mine or the Bartlett Mine, and recommended as "potentially eligible" for listing on the NRHP by O'Day and Pfertsh (2017:44), all cultural resources identified through previous investigations in the Project APE have been determined ineligible for NRHP inclusion, with SHPO consensus. CA-TUL-970 is located on the South Fork Tule River, outside of the Project APE.

The Corps notified the ACHP and California SHPO of the need for a Programmatic Agreement (PA) to govern the Section 106 process for the proposed Project and consulted with the SHPO on the PA development. The Corps also initiated Section 106 consultation regarding this undertaking and PA with the following Indian tribes and Native American communities identified by the California Native American Heritage Commission as having cultural resources interests in the APE: Tule River Indian Tribe, Santa Rosa Rancheria Tachi Yokut Tribe, Kern Valley Indian Community, Tubatulabals of Kern Valley, and Wuksache Indian Tribe/Eshom Valley Band. The PA was fully executed between the Corps and the SHPO on December 13, 2019 (Appendix D). The Corps will continue to consult with the SHPO and Native American interested parties throughout Project construction as described in the PA.

Through these initial and ongoing consultation efforts, the Project actions covered in this SEIR are consistent and compliant with AB 52. Any impacts to TCR would be considered ***less than significant***.

Mitigation Measures:

1999 FEIS/FEIR: This topic was not included in the 1999 FEIS/FEIR. As such, no mitigation measures pertaining to this topic were identified.

New Mitigation Measures proposed by Lead Agency: No new or additional mitigation measures are necessary pertaining to tribal cultural resources (other than related Lead Agency mitigation measures identified in Section 3.5 – Cultural Resources to protect cultural resources).

New Mitigation Measures proposed by SCE (Transmission and Distribution Modifications): No new or additional mitigation measures are necessary pertaining to tribal cultural resources (other than related SCE mitigation measures identified in Section 3.5 – Cultural Resources to protect cultural resources).

Cumulative Impacts:

The scope for considering cumulative impacts to tribal cultural resources are the geographic areas covered by the Tulare County General Plan and the City of Porterville General Plan, as well as the areas designated by the Native American Heritage Commission as having potential to impact tribal cultural resources (TCRs) as a result of the Project (the Project APE). As discussed above, the Project APE is not known to contain any TRCs, and ongoing consultation with potentially affected tribes will occur throughout Project development. In addition, mitigation measures identified in Section 3.5 – Cultural Resources are included to further ensure that potential impacts to TCRs remains less than significant. As the Project does not result in adverse impacts to TCRs, cumulative impacts are considered ***less than cumulatively considerable***.

3.19 Utilities and Service Systems

This section of the SEIR identifies potential impacts to utilities and service systems associated with implementation of the proposed Project. No NOP comment letters were received pertaining to this topic.

Determination of Adequacy of 1999 FEIS/FEIR

The proposed Project footprint and area of potential effect (APE), as well as the proposed new maximum gross pool elevation raise has not changed since evaluation in the 1999 FEIS/FEIR. However, additional information is being provided herein regarding compliance with current rules and regulations pertaining to utilities and service systems. Therefore, the following determinations are made:

Topic	Further Analysis Required?	1999 FEIS/FEIR Analysis Sufficient?
a. Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?		✓
b. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?		✓
c. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?		✓
d. Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?		✓
e. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?		✓

Discussion:

The proposed Project would construct a 10 foot-high concrete ogee weir across the emergency spillway, armor the bridge on California Highway 190 that passes over the lake, add rock slope protection to Frazier Dike to accommodate the increase in gross pool, adjust or flood-protect current recreation facilities, and relocate utilities. The Project will also extend and widen the Tule Recreation Area boat ramps; replace 15 existing lattice steel transmission towers with 14 new, higher H-frame structures; replace approximately 2.3 miles of transmission lines; and remove or relocate existing 12-kV distribution facilities all around the Lake Success area including the area along the Highway 190 bridge to meet minimum clearance criteria resulting from the increased gross pool. Other than increasing the maximum gross pool elevation, the Project primarily consists of relocation of or modification to existing facilities. As described in the 1999 FEIS/FEIR and further described below, the Project would not result in the construction of new or expanded water, wastewater treatment / stormwater drainage, electric power, natural gas, or telecommunication facilities. Some existing utility facilities will be replaced or altered as a described in Chapter Two – Project Description. However, these are not considered to be "new" facilities and any environmental impacts related to construction and operation of these replacement or improvement activities are analyzed within this SEIR under the various CEQA Appendix G topics.

Water Supply

During construction, the proposed Project would use water from local sources for dust control, cleanup, and construction crew member use (consumption and temporary portable restrooms). Water use during construction would be temporary and would not substantially deplete water supplies.

One of the objectives of the Project is to increase water storage capacity of Success Lake. The Tule River Irrigation District and affiliated local irrigation districts in the area have expressed a need for increased water supply in the basin. The ever-changing cycle of wet and dry years causes the area to be vulnerable to inadequate irrigation water supply. During dry years, groundwater pumping is relied upon heavily for irrigation needs. Additional irrigation storage space would increase the ability of the irrigation districts to make better use of the existing water supply of the area. Increased storage capacity would allow holding water for a longer period in the irrigation season that otherwise would be released and could cause damage in the Tulare lakebed, thus making it available for irrigation purposes at a time that is appropriate for crop needs. It also reduces need for groundwater pumping, which reduces overdraft, costs of pumping, and ground

subsidence. Thus, the Project will not deplete water supplies and the impact is considered less than significant.

SCE Project Components

Groundwater could be encountered during construction of SCE's Transmission and Distribution Line Project components. Groundwater encountered would be pumped and dispersed onsite or disposed of at an offsite disposal facility, in accordance with applicable laws. The Project-specific SWPPP would also include BMPs addressing dewatering, designed to ensure that the dewatering occurs in compliance with CVRWQCB permits and that dewatering discharges do not cause erosion at the discharge point. When conducted in compliance with CVRWQCB permits, dispersion of pumped groundwater onto surface areas near construction sites would effectively replace the groundwater removed, resulting in no net change in aquifer volume or groundwater table level. If groundwater is disposed of at an offsite facility, groundwater would be removed, but the impact would be temporary relative to the annual cycle of precipitation and insignificant given the duration of SCE's construction activities (10 months) and excavation depths. Impacts to water supplies would therefore be less than significant.

Wastewater

The proposed Project area is not within an area serviced by a public wastewater treatment system. These areas rely on individual septic systems that are typically maintained by a commercial service contract. The Central Valley Regional Water Quality Control Board (RWQCB) provides direct regulatory oversight of all activities that are deemed to have contaminated, or have the potential to contaminate, the waters of the state.

Construction of the Proposed Project would not generate substantial amounts of wastewater. During construction, portable restrooms would be provided onsite for use by construction workers. The portable restrooms would not be connected to sewer or wastewater systems and would be maintained by a licensed sanitation service. The licensed sanitation service would dispose of the waste at an offsite location and in compliance with standards established by the RWQCB. Construction of the Proposed Project would not involve discharging concentrated wastewater or large volumes of wastewater to a wastewater treatment facility that would exceed treatment requirements set forth by the RWQCB. No impacts associated with wastewater treatment requirements would occur.

Stormwater

Some of the proposed Project activities would occur below the Ordinary High Water Mark (OHWM), which is equivalent to the current gross pool elevation and would fall under the Clean

Water Act (CWA). Temporary land disturbance of greater than one acre would result from project construction; therefore, the contactor would be required to prepare a Stormwater Pollution Prevention Plan (SWPPP) and obtain a NPDES storm water permit (Section 402 of the CWA). Stormwater runoff and spills of petroleum based products during construction activities have the potential to effect water quality conditions at Success Lake and downstream on the Tule River. The Corp is required to obtain a 401 Water Quality Certification and conduct a 404(b)(1) evaluation to comply with the CWA.

Construction activities would include enlarging Lake Success by raising the spillway elevation 10 feet with an ogee weir and excavating to widen the spillway from 200 feet to 365 feet. These changes would increase the capacity of the reservoir by 28,000 acre-feet. In compliance with the CWA and to avoid impacts, a site specific plan with measures addressing proper disposal of silt, debris, refuse, or other pollutants associated with construction on the water side of the spillway would be implemented to prevent fill or rock material and road surface runoff from spilling into the reservoir. With implementation of BMPs required in the construction general permit and the water quality certification and measures, as applicable, effects to water quality are expected to be less than significant.

SCE Project Components

Construction of the SCE Transmission and Distribution Line Project components would disturb a surface area greater than one acre. Therefore, SCE would be required to obtain coverage under the Construction General Permit (CGP) and prepare a SWPPP. The SWPPP will include a site map, description of proposed construction activities, inspection and monitoring requirements, and the BMPs to be used to protect storm water runoff and water quality. The SWPPP will also contain specifications related to inspection, monitoring, and maintenance requirements to ensure that BMPs are correctly implemented to protect storm water runoff and water quality. The specifications for the types and frequency of inspections and monitoring requirements are dictated by the Risk Level or Type (1, 2, or 3) that the project is determined to be by the risk determination performed during SWPPP development.

Commonly used BMPs are storm water runoff quality control measures (perimeter, erosion, and sediment controls), dewatering procedures, good housekeeping, and concrete waste management. The SPCC and SWPPP would be based on final engineering design and would include all Project components.

SCE would also prepare and implement a Hazardous Materials Business Plan and Hazardous Materials Management Plan during construction, which would outline hazardous material

handling, use, and storage requirements, as well as include procedures to implement in the case of a hazardous material release (see Section 3.9, Mitigation SCE HAZ-1). Personnel would be trained on the individual responsibilities under the Clean Water Act, the SPCC, the SWPPP, site-specific BMPs, the locations of Safety Data Sheets for the Project, and steps to take in case of a hazardous materials spill or leak or the discovery of groundwater contamination. Implementation of these plans, along with the BMPs identified in the SPCC and SWPPP, would reduce the potential for water quality degradation during Proposed Project construction to less-than-significant levels.

Wastewater would be generated by construction workers over the approximately 12 to 17-month construction duration of SCE's proposed Project components. However, the amount of wastewater generated during the short construction period would be minimal and would be contained within portable restrooms and treated and disposed of by a licensed contractor. The portable restrooms will be managed in compliance with the SWPPP. No wastewater would be discharged from the site. Thus, impacts would be less than significant.

Solid Waste

Construction of the proposed Project would generate solid waste (in the form of construction debris) that would need to be disposed of at area landfills. Construction debris includes concrete, asphalt, wood, drywall, metals, and other miscellaneous and composite materials. Site preparation (vegetation removal and grading activities) and construction activities would generate construction debris, including wood, paper, glass, plastic, metals, cardboard, and green wastes. Much of this material would be recycled and salvaged to the maximum extent feasible. Materials not recycled would be disposed of at local landfills. The relatively small amount of solid waste generated during construction is not anticipated to have a significant impact on local landfill capacity. Project compliance with federal, State, and local statutes or regulations related to solid waste will result in a less than significant impact.

SCE Project Components

Construction waste materials and removed infrastructure components would require disposal during development of the Proposed Project. This waste may include treated temporary wooden poles replaced during construction, conductor wire, excavated materials, concrete from removed footings, and miscellaneous construction materials. Removal of lattice steel towers would involve removing structures, conductors, and associated hardware. Materials would be recycled as appropriate, and materials that cannot be recycled would be disposed of in accordance with all applicable federal, state, and local regulations. Depending on the condition of each pole, treated

wood poles removed as part of the Proposed Project would be reused, disposed of in a Class I hazardous waste landfill, or disposed of in the lined portion of an RWQCB-certified municipal landfill, in accordance with SCE's Treated Wood Management Program.

In general, soil and vegetative material excavated for the Proposed Project would be used as fill, backfill, made available for use by the landowner, reused, or disposed of offsite in accordance with applicable requirements. Soils and vegetative matter unsuitable for backfill use would be disposed of at appropriate disposal sites following sampling and accurate waste characterization. The existing capacity available at the landfills that would serve the Proposed Project would be adequate to accommodate the volume of waste expected to be generated during the construction phase. Impacts to landfills by construction of the Proposed Project would be less than significant. The operation and maintenance of the proposed Project would generate negligible waste. Operation and maintenance would not significantly differ from existing conditions and would generate a relatively small amount of waste. Because solid waste generation is expected to be equivalent to existing operations, there would be no impact.

Electric Power, Natural Gas and Telecommunications

As described in the 1999 FEIS/FEIR and further described herein, the Project would not result in the construction of new or expanded electric power, natural gas, or telecommunication facilities. Some existing utility facilities will be replaced or altered as a described in Chapter Two – Project Description. However, these are not considered to be "new" facilities and therefore will result in a ***less than significant impact.***

Therefore, the following determinations are made:

CEQA Guidelines Section 15162(a)(1-3)	YES	NO
1. Substantial changes are proposed in the project which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;		✓
2. Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial		✓

increase in the severity of previously identified significant effects.		
3. New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified shows any of the following: a. The project will have one or more significant effects not discussed in the previous EIR; b. Significant effects previously examined will be substantially more severe than shown in the previous EIR; c. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or d. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.		✓

Mitigation Measures:

The mitigation measures listed below are assigned to either the Lead Agency or SCE. The Lead Agency will be responsible for implementation and compliance with the measures listed under "New Mitigation Measures proposed by Lead Agency" and SCE will be responsible for implementation and compliance with the measures listed under "New Mitigation Measures proposed by SCE (Utility Modifications)".

1999 FEIS/FEIR: No mitigation measures pertaining to this topic were identified.

New Mitigation Measures proposed by Lead Agency:

UTI-1 Prior to construction, the contractor shall be required to prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) as part of the construction general permit from the CVRWQCB. This would also include a spill prevention plan detailing the construction activities to take place, BMPs to be implemented to prevent any discharges of stormwater into waterways, and inspection and monitoring activities that would be conducted to address spills and maintain stormwater BMPs. The following standard BMPs would be expected to be implemented to avoid and minimize the potential effects on water quality, ensuring that construction of the proposed action would have less than significant effects on these resources:

- Appropriate erosion control measures would be incorporated into the SWPPP by the construction contractor in order to prevent sediment from entering waterways and to minimize temporary turbidity impacts. Examples include, but are not limited to: straw bales/wattles, erosion blankets, silt fencing, silt curtains, mulching, revegetation, and temporary covers. Sediment and erosion control measures would be maintained by the contractor at all times during construction. Control measures would be inspected periodically by the construction contractor, particularly during and after significant rain events.
- The contractor would use a water truck or other appropriate measures to control fugitive dust on haul roads, construction areas, and stockpiles.
- A fuels spill management plan would be developed for the project by the construction contractor and would be implemented by the contractor.
- Construction equipment and vehicles would be fueled and maintained in specified staging areas only, which would be designed to capture potential spills. These areas cannot be near any ditch, stream, or other body of water or feature that may convey water to a nearby body of water.
- Fuels and hazardous materials would not be stored on site. Any spills of hazardous material would be cleaned up immediately by the construction contractor.
- Construction vehicles and equipment would be inspected frequently and appropriately maintained by the construction contractor to help prevent dripping of oil, lubricants, or any other fluids.
- Construction activities would be scheduled by the contractor to avoid as much of the wet season as practicable. Construction personnel would be trained in storm water pollution prevention practices by the construction contractor.
- In areas proposed for revegetation, initiation and completion of revegetation work would be done by the contractor in a timely manner to control erosion.

New Mitigation Measures proposed by SCE (Utility Modifications): No new or additional mitigation measures are necessary. SCE will comply with existing rules and regulations pertaining to preparation of a SWPPP and implementations of BMPs.

Cumulative Impacts:

The scope for considering cumulative impacts to utilities and service systems are the geographic areas covered by the Tulare County General Plan / EIR and the City of Porterville General Plan / EIR. Cumulative growth that would occur over the life of the Tulare County General Plan / EIR and/or the City of Porterville General Plan / EIR will result in increased demand for utilities and service systems. As the demand for these services increases, there will likely be a need to increase staffing and equipment in order to maintain acceptable performance standards. Cumulative impacts to utilities and service systems are primarily related to other construction projects that could occur during the same time frame as those considered for this Project and within the same vicinity as this Project. Because operation of the Project does not result in significant long-term impacts to these facilities, the Project's incremental contribution to cumulative impacts to utilities and service systems would be ***less than cumulatively considerable***.

3.20 Wildfire

This section of the SEIR evaluates the potential impacts to Wildfire associated with implementation of the proposed Project. No NOP comments were received pertaining to wildfire.

Determination of Adequacy of 1999 FEIS/FEIR

The proposed Project footprint and area of potential effect (APE), as well as the proposed new maximum gross pool elevation raise has not changed since evaluation in the 1999 FEIS/FEIR. However, the CEQA Guidelines have been updated to include questions related to impacts to wildfire. Therefore, the following determinations are made:

Topic	Further Analysis Required?	1999 FEIS/FEIR Analysis Sufficient?
a. Would the project substantially impair an adopted emergency response plan or emergency evacuation plan?	✓	
b. Would the project, due to slope, prevailing winds, and other factors, exacerbate wildfire risk, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	✓	
c. Would the project require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	✓	
d. Would the project expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	✓	

Discussion:

The 1999 FEIS/FEIR did not address potential impacts to wildfire because it was prepared prior to the 2018 amendment to the State CEQA Guidelines requiring the evaluation of environmental impacts related to wildfire. Therefore, this section provides a comprehensive analysis of wildfire associated with the proposed Project.

Environmental Setting

The proposed Project is located in the western foothills of the Sierra Nevada mountain range approximately 6 miles east of the City of Porterville within unincorporated Tulare County, California. Elevations of the Project site range from 650 to 700 feet above sea level. The area surrounding the proposed Project and Lake Success is characterized by recreation and agricultural land uses, with scattered residences. Landform in the Project area is dominated by Lake Success and the surrounding grassy hills. Man-made features in the area include the existing roadways, utilities (SCE transmission and distribution lines), the reservoir dam, camping/recreation areas, parking areas and associated improvements. SCE's Proposed Project components are located primarily within the existing right-of-way (ROW) for the existing Magunden-Springville No. 1 and No. 2 Transmission Lines, beginning at the Springville Substation, located north of Lake Success at the intersection of Avenue 176 and Frazier Dike, and following the existing north/south alignment approximately 2.3 miles southward across the western portion of Lake Success. The proposed Project also includes possible relocation or removal of existing SCE distribution facilities within the highest lake elevation rise. These facilities occur around the lake and along the Highway 190 bridge. The Magunden-Springville No. 1 and No. 2 Transmission Lines and a portion of the distribution facilities are located on land under the jurisdiction of the Corps Sacramento District, while the remainder of the distribution facilities are located on private land.

Emergency Response Plans and Emergency Evacuation Plans

Fire services in the proposed Project area are provided by the Tulare County Fire Department and California Department of Forestry and Fire Protection. The Tulare County Fire Department is made up of more than 400 Emergency Services personnel. The department responds to approximately 12,000 calls for service each year, mostly involving medical emergencies.[1] The Department's Station Number (#) 20 is located approximately 4.4 miles from Lake Success Park

[1] Tulare County Fire Department. Our Services. https://tularecounty.ca.gov/fire/. Accessed July 2020.

and the southern extent of the proposed Project, while the Department's Station #22 is located approximately 9 miles from Springville Substation and the northern extent of the proposed Project. Addresses are as follows:

- Tulare County Fire Department Station #20: 151 East Success Drive, Porterville, CA 93257
- Tulare County Fire Department Station #22: 35659 Highway 190, Springville, CA 93265

Fire hazards are prevalent in the area due to the rural characteristics of the proposed Project area. According to the CAL FIRE Fire Hazard Severity Zone map, the proposed Project study area contains Moderate and High hazard areas (see Figure 3.20-1, Fire Hazard Severity Zones). The proposed Project study area is also within the California Public Utility Commission's (CPUC) designated Fire Threat Area Tier 2 – Elevated district, as shown in Figure 3.20-1. Tier 2 indicates there is an elevated risk from utility associated wildfires.[2]

Landslides and Slope Intensity

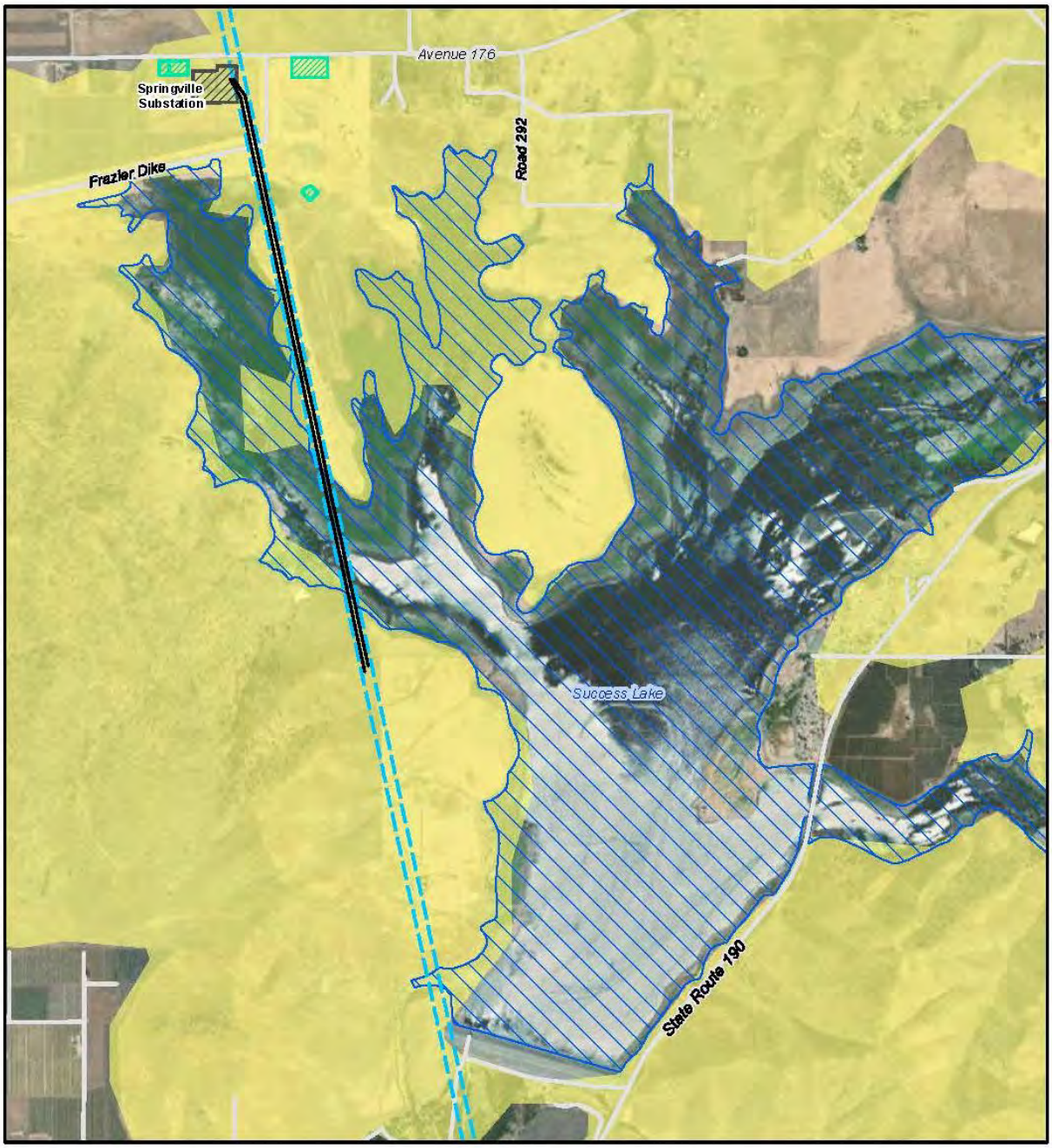
Based on a geotechnical study, including four geotechnical borings along the proposed Project, Amec Foster Wheeler (2017 data report) reported that surficial materials are generally clay and sandy clay extending to depths of 2 to 7.8 feet below ground surface, the area is relatively level, the potential for slope stability hazard is low, the geologic materials are very dense, and the potential for liquefaction is low.

Wildfire History

SCE completed a query of publicly-available databases in June 2020 to determine whether any reportable fires occurred within 5 miles of the proposed Project study area for the time period of 1992 through 2017. Fire information was obtained from a variety of sources, including California Department of Forestry and Fire Protection (CAL FIRE) and federal data; the information represents the time period of available public data. SCE identified 11 reportable fires and 796 smaller fires that occurred within 5 miles of the proposed Project study area from 1992 to 2017. Data after 2017 was not yet available time at the time of the data query. Refer to Table 3.20-1 – Proposed Project Wildfire History, 1992 – 2017.

[2] Cal Fire. Office of the State Fire Marshal. https://osfm.fire.ca.gov/divisions/wildfire-planning-engineering/wildland-hazards-building-codes/fire-hazard-severity-zones-maps/. Accessed July 2020.

Figure 3.20-1 – CPUC Fire Threat Map



LEGEND

- Replacement of Existing Transmission Line
- Contractor Material Yard
- Substation
- Right-of-Way
- Success Lake
- CPUC Fire Threat Tier 2 Elevated

N

0 0.5 Miles

Source: California Public Utilities Commission
Basemap Source: ESRI World Imagery

\\galt\proj\SoCalEDISON\697091\MapFiles\PEA\Figure_4.20-1_200623.mxd

Figure 4.20-1
CPUC Fire Threat
Lake Success Transmission Project
Southern California Edison
Tulare County, California

ch2m

Table 3.20-1. Proposed Project Wildfire History, 1992 to 2017[3]

Type of Fire	Within 5 Miles of Proposed Project Study Area
Reportable Fire[a]	11
Smaller Fire	796
[a] A Reportable Fire is one that is 300 acres or greater in grassland or 100 acres or greater in timberland.	

Fire Hazard Severity Zones

CAL FIRE's Fire and Resources Assessment Program provides Fire Hazard Severity Zones Maps that identify Fire Hazard Severity Zones in Local, State, or Federal Responsibility Areas. Within these areas, CAL FIRE has designated certain areas as Very High, High, or Moderate, depending on the responsibility area. The proposed Project is located within areas of Moderate and High Fire Hazard Severity Zones as identified by CAL FIRE's Fire Hazard Severity Zone Map within both a State Responsibility Area (SRA) and a Federal Responsibility Area (FRA). The proposed Project area is not located within a Local Responsibility Area (LRA).

Additionally, CAL FIRE's Fire and Resources Assessment Program provides information that identify Very High Fire Hazard Severity Zones (VHFHSZ) within LRAs, SRAs, and FRAs. Within these areas, CAL FIRE has designated certain areas as VHFHSZ, or Non-VHFHSZ. As of September 2007, CAL FIRE has determined that Tulare County has no VHFHSZ in the LRA, and therefore does not provide further information on recommended VHFHSZ in the LRA.[4]

The CPUC Fire-Threat Map data is presented in Figure 4.20-1; as shown, the majority of the proposed Project is located within CPUC-designated Fire Threat Area Tier 2 – Elevated.

Regulatory Setting

California Senate Bill 901

Passed in 2018, Senate Bill 901 adopted new provisions of California Public Utilities Code Section 8386 requiring all electric utilities to prepare, submit, and implement annual wildfire mitigation plans that describe the utilities' plans to construct, operate, and maintain their electrical lines and

[3] Southern California Edison. Southern California Edison 2020-2022 Wildfire Mitigation Plan. https://www.sce.com/sites/default/files/AEM/Wildfire%20Mitigation%20Plan/SCE's%202020-2022%20Wildfire%20Mitigation%20Plan%20-%20Revision%2003.pdf. Accessed July 2020.

[4] Cal Fire. Office of the State Fire Marshall. Fire Hazard Severity Zones Maps. Tulare County Local Responsibility Area. https://osfm.fire.ca.gov/media/6832/fhszl06_1_map54.pdf. Accessed July 2020.

equipment in a manner that will help minimize the risk of catastrophic wildfires associated with those electrical lines and equipment.

The CPUC has sole and exclusive jurisdiction over the siting and design of the proposed Project components located in the State of California. Pursuant to CPUC G.O. 131-D, Section XIV.B, "Local jurisdictions acting pursuant to local authority are preempted from regulating electric power line projects, distribution lines, substations, or electric facilities constructed by public utilities subject to the CPUC's jurisdiction. However, in locating such projects, the public utilities shall consult with local agencies regarding land use matters."[5] Consequently, public utilities are directed to consider local regulations and consult with local agencies, but the county and cities' regulations are not applicable as the county and cities do not have jurisdiction over the proposed Project. Accordingly, the following discussion of local regulations is provided for informational purposes only.

Tulare County General Plan

The Tulare General Plan 2030 Update provides a comprehensive, long-term plan for future land use and physical development of Tulare County through 2030 by promoting healthy sustainable growth while protecting agricultural lands through the direction of growth to urban areas. The General Plan Update consists of policies that establish objectives, principles, and standards that guide future land use decisions within the County.[6] Section 10.6 of Part 1 of the General Plan Update provides goals and policies related to urban and wildland fire hazards. Some goals are to minimize the exposure of county residents, visitors, and public and private property to the impacts of urban and wildland fires, and to provide effective emergency response to natural or human-made hazards and disasters.

Southern California Edison 2020-2022 Wildfire Mitigation Plan

The SCE 2020–2022 Wildfire Mitigation Plan (SCE Wildfire Plan)[7] primarily aims to set forth actionable, measurable, and adaptive measures from 2020 to 2022 to reduce the risk of potential wildfires-causing ignitions associated with SCE electrical equipment within High Fire Risk Areas (HFRA). Consistent with the requirements of California Public Utilities Code Section 8386(a), in accordance with the SCE Wildfire Plan, SCE also aims to construct, maintain, and operate its

[5] Public Utilities commission of the State of California. General Order No. 131-D. https://docs.cpuc.ca.gov/PUBLISHED/Graphics/589.PDF. Accessed July 2020.
[6] Tulare County General Plan 2030. http://generalplan.co.tulare.ca.us/. Accessed July 2020.
[7] Southern California Edison. Southern California Edison 2020-2022 Wildfire Mitigation Plan. https://www.sce.com/sites/default/files/AEM/Wildfire%20Mitigation%20Plan/SCE's%202020-2022%20Wildfire%20Mitigation%20Plan%20-%20Revision%2003.pdf. Accessed July 2020.

electrical lines and equipment in a manner that will minimize the risk of catastrophic wildfire posed by those electrical lines and equipment by implementing measures that safeguard SCE's electric system against wildfires and improve system resiliency; minimizing Public Safety Power Shutoff (PSPS) event impacts to its customers and communities; improving fire agencies' ability to detect and respond to emerging fires; improving coordination with utility emergency management personnel; reducing the impact of wildfires and wildfire mitigation efforts on the public; and engaging the public about how to prepare for, prevent, and mitigate wildfires in SCE's HFRA.

Thresholds of Significance

The significance criteria for assessing the impacts to wildfires come from the CEQA Environmental Checklist. According to the CEQA Environmental Checklist, a project causes a potentially significant impact if, located in or near state responsibility areas or lands classified as VHFHSZ, the proposed Project would:

- Substantially impair an adopted emergency response plan or emergency evacuation plan.
- Due to slope, prevailing winds, and other factors, exacerbate wildfire risk, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire.
- Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment.
- Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.

Impacts and Mitigation Measures

Impact 3.20-1: *Would the project substantially impair an adopted emergency response plan or emergency evacuation plan?*

Less Than Significant. The proposed Project includes modifying the existing spillway by constructing a concrete ogee weir which will increase the gross pool elevation by ten feet, which will in turn increase the existing water storage capacity and increase the reservoir surface area. In addition to reinforcing the Highway 190 bridge abutments and Frazier Dike, the increased pool

elevation will require structures and supporting utilities at both the Rocky Hill and Tule Recreation Areas to be relocated or flood protected. Relocated or modified structures include restroom facilities, parking areas, boat ramps, pumphouse facilities, a storage tank, well, and metal shed. No additional structures will be constructed as a part of the Project.

Also included in the Project is the removal and replacement of approximately 2.3 miles of existing 220-kilovolt transmission line facilities, primarily within an existing 200-foot ROW, use of nearby staging yards and adjacent access roads, and the removal and/or replacement of existing distribution facilities within the highest lake level rise elevation.

Construction

During construction of all Project activities (including SCE's Proposed Project components), the Project would not significantly impact an adopted emergency response plan or emergency evacuation plan. Routes for emergency vehicles will be maintained throughout proposed Project construction. No road closures are expected for transmission construction; however, short-term, temporary road or lane closures could be required for distribution line construction. SCE will use a combination of access roads and spur roads from a network of existing paved and unpaved public and private roads. Construction vehicles and equipment will be staged at the staging areas and within helicopter landing zones, located outside of emergency access routes. Construction vehicles and equipment needed at the sites are expected to be staged or parked within SCE ROW or franchise.

The proposed Project activities could have the potential, in rare circumstances, to slow emergency response vehicles (e.g., a slow-moving delivery truck could temporarily occupy a lane or space needed for emergency vehicle access); this potential effect will be less than significant with implementation of the traffic control measures discussed in Section 3.17.

Emergency access to Springville Substation will continue to be provided from the existing driveway on Avenue 176. Therefore, the impact will be ***less than significant*** to adopted emergency response or evacuation plans.

Operation

After construction is complete, traffic and transportation resources are expected to resume normal operating conditions. There would be no permanent disruption of emergency vehicle access and all existing emergency response plans and emergency evacuation plans would remain unaltered. Operation and maintenance of SCE's Proposed Project components would include transmission line and distribution facilities maintenance, routine access road maintenance,

vegetation clearing, tree pruning, and other related operations and maintenance activities. Activities conducted during operation of the proposed Project would be consistent with existing O&M activities and in compliance with existing state and federal laws, rules, and regulations. Therefore, there would ***less than significant impacts*** to adopted emergency response or evacuation plans.

Impact 3.20-2: *Would the project, due to slope, prevailing winds, and other factors, exacerbate wildfire risk, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?*

No Impact. No components of the proposed Project are designed for human occupancy; therefore, ***no impacts*** would occur. The Project primarily consists of modified facilities or replacement facilities. Once operational, these facilities do not result in an impact greater than existing conditions.

Impact 3.20-3: *Would the project require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?*

Less Than Significant Impact With Mitigation.

Construction

Portions of the proposed Project site are within the Moderate and High CAL FIRE Hazard Zones.[8] Additionally, the majority of the proposed Project is located within the CPUC-designated Fire Threat Area Tier 2 – Elevated (Figure 3.20-1). The risk of fire danger from the construction of the proposed Project is related to smoking, refueling, and operating vehicles and other equipment off roadways. Welding during construction of towers or support structures could also potentially result in the combustion of native materials near the welding site. Transmission and distribution lines may pose a fire hazard when a conducting object comes near a line or when a live-phase conductor falls to the ground.

[8] CalFire Fire Hazard Severity Zones in SRA. https://osfm.fire.ca.gov/media/6830/fhszs_map54.pdf. Accessed July 2020.

SCE's Fire Management Plan would include requirements for prevention, control, and extinguishment of fires (see Section 3.9, Mitigation SCE HAZ-1). The Fire Management Plan will include measures to address smoking and fire rules, storage and parking areas, use of gasoline-powered tools, use of spark arrestors on construction equipment, use of a fire tools and equipment, and training requirements. Implementation of a Fire Management Plan would reduce impacts to ***less than significant***.

Operation

After construction is complete, the modified and/or replaced facilities associated with the increased gross pool elevation raise (spillway enlargement, Highway 190 bridge abutments, Frazier Dike improvements, and modifications to existing recreational facilities) would not exacerbate fire risk. Operation of the existing Magunden–Springville No. 1 and No. 2 Transmission Lines and existing distribution facilities associated with the proposed Project may pose a fire hazard when a conducting object comes near a line or when a livephase conductor falls to the ground. During maintenance activities, there is risk of fire danger from operating vehicles and other equipment off roadways during maintenance. To minimize the risk of trees falling on the subtransmission or distribution lines or other accidental ignition of a wildland fire from the subtransmission or distribution lines, SCE would follow state vegetation and tree clearing requirements, including CPUC G.O. 95 and California Public Resources Code Section 4293, which require that certain vegetation management activities be performed and maintained for overhead conductors that traverse trees and vegetation to establish necessary and reasonable clearances measured between line conductors and vegetation under normal conditions. Additionally, some distribution facilities may be removed for the proposed Project which could reduce potential impacts. Activities conducted during operation of the proposed Project would be consistent with existing O&M activities; impacts therefore would be ***less than significant.***

Impact 3.20-4: *Would the project expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?*

Less Than Significant Impact.

Construction

The proposed Project SWPPP would include measures to control stormwater runoff rates which would minimize the potential for significant alteration of drainage patterns that would result in downslope or downstream flooding. Further, improvements to existing access roads and spur

roads and construction of new spur roads would include design considerations to maintain or improve drainage patterns within the proposed Project alignment. Therefore, through drainage design and SWPPP implementation, the proposed Project would not substantially alter the existing drainage pattern of the site or area or increase the rate or amount of surface runoff in a manner which would result in downstream or downslope flooding.

Much of the proposed Project is located in valley areas that would not be susceptible to post-fire slope instability. Localized areas of relatively steep slopes and increased landslide hazards occur where the components of the proposed Project run along the edges of hills and mountains. These localized areas may be susceptible to post-fire slope instability. However, these areas are generally indicated to have a Moderate fire hazard severity rating, indicating that the vegetation in the area is less susceptible to fire or is sparser than in other areas, or that few structures susceptible to fire (and thus inhabitants) are present. Given this, impacts from post-fire slope instability would be ***less than significant.***

Operation

After construction is complete, the modified and/or replaced facilities associated with the increased gross pool elevation raise (spillway enlargement, Highway 190 bridge abutments, Frazier Dike improvements, and modifications to existing recreational facilities) would not exacerbate flooding, landslides, slope instability or change to drainage. SCE's Proposed Project component operation and maintenance would include transmission line maintenance, routine access road maintenance, vegetation clearing, tree pruning, and other related operations and maintenance activities. Activities conducted during operation of the proposed Project would be consistent with existing O&M activities and in compliance with existing state and federal laws, rules, regulations, and SCE's Wildfire Mitigation Plan. Therefore, any impacts would be ***less than significant.***

Mitigation Measures:

1999 FEIS/FEIR: This topic was not included in the 1999 FEIS/FEIR. As such, no mitigation measures pertaining to this topic were identified.

New Mitigation Measures proposed by Lead Agency: No new or additional mitigation measures are necessary.

New Mitigation Measures proposed by SCE (Utility Modifications): No new or additional mitigation measures are necessary.

Cumulative Impacts:

The scope for considering cumulative impacts resulting from wildfires are the geographic areas covered by the Tulare County General Plan / EIR and the City of Porterville General Plan / EIR. As discussed above, the Project is within the Moderate and High CAL FIRE Hazard Zones as well as the CPUC-designated Fire Threat Area Tier 2 – Elevated. The proposed Project's Fire Management Plan includes requirements for prevention, control, and extinguishment of fires, which would decrease the risk for wildfire, and the proposed Project area would be required to comply with the existing O&M activities currently in place. Adherence to these requirements would ensure that impacts resulting from wildfire would be less than significant. As the Project does not result in adverse impacts to wildfire risk, cumulative impacts are considered ***less than cumulatively considerable***.

Chapter 4

PROJECT ALTERNATIVES

PROJECT ALTERNATIVES

4.1 Introduction

CEQA Guidelines Section 15126.6 requires the consideration of a range of reasonable alternatives to the proposed Project that could feasibly attain most of the objectives of the proposed Project. The Guidelines further require that the discussion focus on alternatives capable of eliminating significant adverse impacts of the project or reducing them to a less than significant level, even if the alternative would not fully attain the Project objectives or would be more costly. According to CEQA Guidelines, the range of alternatives required in an EIR is governed by the "rule of reason" that requires an EIR to evaluate only those alternatives necessary to permit a reasoned choice. An EIR need not consider alternatives that have effects that cannot be reasonably ascertained and/or are remote and speculative.

The EIR shall include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. A matrix displaying the major characteristics and significant environmental effects of each alternative may be used to summarize the comparison. If an alternative would cause one or more significant effects in addition to those that would be caused by the project as proposed, the significant effects of the alternative shall be discussed, but in less detail than the significant effects of the project as proposed.

CEQA Guidelines §15126.6(e) identifies the requirements for the "No Project" alternative. The specific alternative of "No Project" shall also be evaluated along with its impact. The purpose of describing and analyzing a no project alternative is to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project. The no project alternative analysis is not the baseline for determining whether the proposed project's environmental impacts may be significant, unless it is identical to the existing environmental setting analysis which does establish that baseline (see Section 15125).

Alternative locations can also be evaluated if there are feasible locations available. Each alternative is evaluated against the Project objectives and criteria established by the Lead Agency.

4.2 Project Objectives

In accordance with CEQA Guidelines Section 15124(b), the following are the Lower Tule River Irrigation District's Project objectives:

- Provide increased flood protection to urban and agricultural areas.
- Provide increased storage for Tule River irrigation water, incidental to the flood control objective.
- Enhance storage space for sediment in Lake Success.
- Provide increased recreational opportunities within the basin.

The following are Southern California Edison's Project objectives as they pertain to utility infrastructure associated with the Project:

- Provide safe and reliable electrical service.
- Address steel tower corrosion of Magunden-Springville No. 1 and No. 2 220-kV Transmission Lines.
- Address existing 12-kV distribution facilities that will be affected by the rise in lake levels.
- Address both General Order (G.O.) 95 and USACE Regulation 1110-2-4401 conductor clearance requirements for the Magunden-Springville No.1 and No.2 220-kV Transmission Lines.
- Comply with all applicable reliability-planning criteria required by North American Electric Reliability Corporation, Western Electricity Coordinating Council, and the California Independent System Operator.
- Meet Project needs while minimizing environmental impacts.
- Design and construct the Project in conformance with SCE's approved engineering, design, and construction standards for substation, transmission, subtransmission, and distribution system projects.

4.3 Alternatives Considered in this EIR

Lead Agency Alternatives

- **Alternatve 1 – No Project Alternative**
- **Alternative 2 – Alternate Gross Pool Elevation Raise**

SCE (Utility Modification) Alternatives

- **Alternatve 1 – No Project (No Utility Modifications) Alternative**
- **Alternative 2 – Earthen Berm (Transmission Line Structures) Alternative**

Lead Agency Alternatives Rejected

According to the CEQA Guidelines, two primary provisions are necessary for an adequate alternative site analysis – feasibility and location. The EIR should consider alternate project locations if a significant project impact could be avoided or substantially lessened by moving the project to an alternate site. An alternative site for the proposed Project would not be feasible because the Project consists of providing improved flood protection design and increasing the water storage capacity of Lake Success. The Project is, by definition, located in and around Lake Success. Since the Project consists of improvements to a specific area, an alternative location for this Project is not feasible. A discussion of an infeasible alternative site would not meet the "rule of reason" under CEQA and an Alternative Project Location was eliminated from further consideration in this EIR.

SCE Alternatives Rejected

SCE considered several non-transmission alternative concepts such as distributed generation (generating renewable power to offset peak loading and improve reliability), energy efficiency and conservation (increase energy efficiency and conservation to reduce system loading and demand for power), and demand response (reduce demand/electricity during periods of peak energy use). These non-transmission alternative concepts were eliminated and not considered further as they do not meet the following SCE Proposed Project objectives:

- Would not address existing steel tower corrosion of Magunden-Springville No. 1 and No. 2 220-kilovolt (kV) Transmission Lines.
- Would not meet G.O. 95 or USACE Regulation 1110-2-4401 clearance requirements.

Lead Agency Alternative 1 – No Project Alternative

Description

CEQA Section 15126.6(e) requires the discussion of the No Project Alternative "to allow decision makers to compare the impacts of approving the proposed Project with the impacts of not approving the proposed project." The No Project scenario in this case means that the Federal Government would take no action toward implementing a flood control project or increasing the water storage capacity of Lake Success. No additional flood control projects would be built in the area and the flood threat would increase in the Porterville area (presently at a 1 in 14 chance of flooding to agricultural areas and about a 1 in 50 chance of flooding to the City of Porterville), area downstream of Porterville to the Tulare lakebed, and the Tulare lakebed. Future population trends, land use, and urban growth would continue generally as identified in current local plans. The cities and counties would continue to participate in the National Flood Insurance Program (NFIP) and would require developers/homebuilders to flood proof future developments within the 100 year flood plains elevation. Sediment accumulation into Lake Success would continue to encroach on storage capacity and would diminish the level of flood control protection afforded to areas downstream of the Richard L. Schafer Dam. The loss of flood control storage space would also adversely impact the fishery and recreation use at Lake Success from late summer through the winter. Irrigation water storage at Lake Success would also be diminished.

Environmental Considerations

Under the No Project Alternative, there would be no changes to any of the existing environmental conditions and there would either be no impact, or similar impact (to the proposed Project) to each of the 20 CEQA Checklist evaluation topics, with the exception of Impact Section 3.10 – Hydrology and Water Quality and Section 3.16 – Recreation, both of which would have greater impacts than the proposed Project (see discussion below). The No Project Alternative by definition would not meet the objectives of the proposed Project that were discussed earlier in this section.

1. **Aesthetics** – No Project activities would occur and there would be no changes to the existing visual/aesthetic setting. As such, the aesthetic impacts of the No Project alternative are less than the proposed Project.
2. **Agricultural and Forestry Resources** - No Project activities would occur and there would be no impact to agricultural or forest lands. As such, the agricultural impacts of the No Project Alternative are less than the proposed Project.

3. **Air Quality** – No Project activities would occur and there would be no additional air emissions (construction related or operational emissions). Thus, the air quality impacts of the No Project Alternative are less than the proposed Project.
4. **Biological Resources** - No Project activities would occur and there would be no impact to existing biological resources. Thus, the biological impacts of the No Project Alternative are less than the proposed Project.
5. **Cultural Resources** - No Project activities would occur and there would be no impact to existing cultural resources. Thus, the cultural resource impacts of the No Project Alternative are less than the proposed Project.
6. **Energy** - No Project activities would occur and there would be no additional energy use (construction related or operational energy use). Thus, the energy impacts of the No Project Alternative are less than the proposed Project.
7. **Geology/Soils** - No Project activities would occur and there would be no impact to existing geologic resources or soils. Thus, the geological impacts of the No Project Alternative are less than the proposed Project.
8. **Greenhouse Gas Emissions** - No Project activities would occur and there would be no additional greenhouse gas emissions (construction related or operational emissions). Thus, the greenhouse gas impacts of the No Project Alternative are less than the proposed Project.
9. **Hazards & Hazardous Materials** - No Project activities would occur and there would be no additional impacts related to hazards or hazardous materials. Thus, the hazardous impacts of the No Project Alternative are less than the proposed Project.
10. **Hydrology/Water Quality -** No Project activities would occur and there would be no flood reduction improvements implemented or additional water storage capacity. Two of the Project Objectives of the Project include flood risk reduction and increased water storage capacity. Under the No Project Alternative, the existing flood risk levels would be maintained and water storage capacity would remain at its current level. Therefore, the hydrologic impacts of the No Project Alternative are greater than the proposed Project.
11. **Land Use/Planning** - No Project activities would occur and there would be no additional impacts related to land use and planning. Thus, land use and planning impacts of the No Project Alternative are less than the proposed Project.
12. **Mineral Resources** - No Project activities would occur and there would be no additional impacts related to mineral resources. The SEIR determined that the proposed Project would have no impacts to mineral resources. Thus, the mineral resource impacts of the No Project Alternative would be similar to the proposed Project.

13. **Noise** - No Project activities would occur and there would be no additional impacts related to noise. Thus, the noise impacts of the No Project Alternative are less than the proposed Project.
14. **Population/Housing** - No Project activities would occur and there would be no additional impacts related to population and housing. Thus, the population and housing impacts of the No Project Alternative are less than the proposed Project.
15. **Public Services** - No Project activities would occur and there would be no additional impacts related to public services. Thus, the public service impacts of the No Project Alternative are less than the proposed Project.
16. **Recreation** - No Project activities would occur and there would be no additional improvements to recreational facilities. One of the Project Objectives of the Project includes an increase in recreational opportunities associated with the proposed lake capacity expansion and related recreational improvements identified in Chapter Two – Project Description. Under the No Project Alternative, the existing recreational features would be retained and no additional improvements to recreational facilities would be implemented. Therefore, the recreation impacts of the No Project Alternative are greater than the proposed Project.
17. **Transportation -** No Project activities would occur and there would be no additional impacts related to transportation. Thus, the transportation impacts of the No Project Alternative are less than the proposed Project.
18. **Tribal Cultural Resources -** No Project activities would occur and there would be no impact to existing tribal cultural resources. Thus, the tribal cultural resource impacts of the No Project Alternative are less than the proposed Project.
19. **Utilities/Service Systems -** No Project activities would occur and there would be no additional impacts related to utilities or service systems. Thus, the utility and service system impacts of the No Project Alternative are less than the proposed Project.
20. **Wildfire** - No Project activities would occur and there would be no additional impacts related to wildfire. Thus, the wildfire impacts of the No Project Alternative are less than the proposed Project.

SCE Alternative 1 – No Project (No Utility Modifications) Alternative

Description

Under the SCE No Project (No Utility Modifications) Alternative, no modification of the existing transmission lines and related facilities would occur. Therefore, the SCE No Project Alternative would not meet any of the Proposed Project's objectives.

Environmental Considerations

Under the SCE No Project Alternative, there would be no additional environmental impacts associated with construction of the transmission and distribution facilities associated with SCE's Proposed Project. However, the SCE No Project Alternative would result in the following effects:

- The continuation of current conditions, in which the structural integrity of the existing Magunden-Springville No. 1 and No. 2 220-kV Transmission Line towers would continue to deteriorate.
- SCE would not meet G.O. 95 or USACE Regulation 1110-2-4401 clearance requirements.

Lead Agency Alternative 2 – Alternate Gross Pool Elevation Raise

Description

Three different enlargement sizes for Lake Success were evaluated in this alternative. These sizes are 4-foot, 10-foot, and 20-foot gross pool raises. An effective way to increase storage at Lake Success would be to raise the height of the spillway sill by constructing a concrete ogee across the existing sill (and widen the spillway to safely pass the Probable Maximum Flood).

A 4-foot raise in the spillway was studied because it could be constructed without having to widen the spillway using pre-1996 PMF flood criteria. The 10-foot raise was an intermediate size that was selected without requiring costly relocation to Highway 190 (the spillway would require widening from 200 feet to 365 feet). The 20-foot increase was selected for investigation because it was about as large an increase that could be made without extensive modifications to the dam. The three alternative gross pool elevations were evaluated that resulted in increased storage capacities and new overall reservoir capacities as shown in table 4-1.

Table 4-1: Alternative Gross Pool Elevations

Pool Elevation Capacity Increase (feet)	New Gross Pool Elevation (feet, NAVD88)	Increased Capacity (acre-feet)	New Total Capacity (acre-feet)
4	659.1	10,400	92,700
10	665.1	28,000	110,300
20	675.1	62,100	144,400

In the 1999 FEIS/FEIR, the Corps evaluated the three reservoir enlargement sizes based on cost, flood protection, irrigation water supply and hyrdo power generation. The 10-foot raise (proposed Project) was selected because it is the plan that reasonably maximizes national economic development benefits and is the Federally supportable plan.

Environmental Considerations

Under CEQA, a feasible alternative must result in a reduction of environmental impacts as compared to the Project. Since a 20-foot raise would increase the severity of impacts as compared to the 10-foot raise (proposed Project), it is not environmentally evaluated herein. The 4-foot raise would result in slightly less (or similar) environmental impacts as compared to the proposed Project as follows:

1. **Aesthetics** – A 4-foot gross pool raise would reduce the size of the proposed Project footprint (by reducing the maximum lake surface area) and would result in less modifications to the spillway and Frazier Dike. This Alternative would also potentially reduce the height of the SCE transmission towers that would need to be raised under the proposed Project. This would result in a slightly reduced visual impact. As such, the aesthetic impacts of the 4-foot Gross Pool Elevation Raise Alternative are less than the proposed Project.
2. **Agricultural and Forestry Resources** - A 4-foot gross pool raise would reduce the size of the proposed Project footprint (by reducing the maximum lake surface area) and would result in less modifications to the spillway and Frazier Dike. This would result in less land that is needed to accommodate the lake capacity increase. As such, the agriculture and forestry impacts of the 4-foot Gross Pool Elevation Raise Alternative are less than the proposed Project.

3. **Air Quality** – A 4-foot gross pool raise would reduce the size of the proposed Project footprint (by reducing the maximum lake surface area) and would result in less modifications to the spillway and Frazier Dike. However, air emissions would still occur during construction activities, albeit at a reduced level because the amount of construction needed to accommodate this Alternative would be slightly less than the proposed Project. As such, the air quality impacts of the 4-foot Gross Pool Elevation Raise Alternative are less than the proposed Project.
4. **Biological Resources** - A 4-foot gross pool raise would reduce the size of the proposed Project footprint (by reducing the maximum lake surface area) and would result in less modifications to the spillway and Frazier Dike. However, potential impacts to biological resources would still occur, but would be reduced because of the decreased footprint of construction and operational activities. As such, the biological impacts of the 4-foot Gross Pool Elevation Raise Alternative are less than the proposed Project.
5. **Cultural Resources** - A 4-foot gross pool raise would reduce the size of the proposed Project footprint (by reducing the maximum lake surface area) and would result in less modifications to the spillway and Frazier Dike. However, potential impacts to cultural resources would still occur, but would be reduced because of the decreased footprint of construction and operational activities. As such, the cultural impacts of the 4-foot Gross Pool Elevation Raise Alternative are less than the proposed Project.
6. **Energy** - A 4-foot gross pool raise would reduce the size of the proposed Project footprint (by reducing the maximum lake surface area) and would result in less modifications to the spillway and Frazier Dike. However, energy use would still occur during construction activities, albeit at a reduced level because the amount of construction needed to accommodate this Alternative would be slightly less than the proposed Project. As such, the energy impacts of the 4-foot Gross Pool Elevation Raise Alternative are less than the proposed Project.
7. **Geology/Soils** - A 4-foot gross pool raise would reduce the size of the proposed Project footprint (by reducing the maximum lake surface area) and would result in less modifications to the spillway and Frazier Dike. However, potential impacts to geology and soils would still occur, but would be reduced because of the decreased footprint of construction and operational activities. As such, the geology and soils impacts of the 4-foot Gross Pool Elevation Raise Alternative are less than the proposed Project.
8. **Greenhouse Gas Emissions** - A 4-foot gross pool raise would reduce the size of the proposed Project footprint (by reducing the maximum lake surface area) and would result in less modifications to the spillway and Frazier Dike. However, greenhouse gas emissions would still occur during construction activities, albeit at a reduced level because

the amount of construction needed to accommodate this Alternative would be slightly less than the proposed Project. As such, the greenhouse gas impacts of the 4-foot Gross Pool Elevation Raise Alternative are less than the proposed Project.

9. **Hazards & Hazardous Materials** - A 4-foot gross pool raise would reduce the size of the proposed Project footprint (by reducing the maximum lake surface area) and would result in less modifications to the spillway and Frazier Dike. However, potential impacts from hazards and hazardous materials would still occur, but would be reduced because of the decreased footprint of construction and operational activities. As such, the hazards and hazardous materials impacts of the 4-foot Gross Pool Elevation Raise Alternative are less than the proposed Project.
10. **Hydrology/Water Quality -** A 4-foot gross pool raise would reduce the size of the proposed Project footprint (by reducing the maximum lake surface area) and would result in less modifications to the spillway and Frazier Dike. However, potential impacts to hydrology and water quality would still occur, but would be reduced because of the decreased footprint of construction and operational activities. As such, the hydrology and water quality impacts of the 4-foot Gross Pool Elevation Raise Alternative are less than the proposed Project.
11. **Land Use/Planning** - A 4-foot gross pool raise would reduce the size of the proposed Project footprint (by reducing the maximum lake surface area) and would result in less modifications to the spillway and Frazier Dike. However, potential impacts to land use and planning would still occur, but would be reduced because of the decreased footprint of construction and operational activities. As such, the land use and planning impacts of the 4-foot Gross Pool Elevation Raise Alternative are less than the proposed Project.
12. **Mineral Resources** - A 4-foot gross pool raise would reduce the size of the proposed Project footprint (by reducing the maximum lake surface area) and would result in less modifications to the spillway and Frazier Dike. The SEIR determined that the proposed Project would have no impacts to mineral resources. As such, impacts to mineral resources associated with the 4-foot Gross Pool Elevation Raise Alternative are similar to the proposed Project.
13. **Noise** - A 4-foot gross pool raise would reduce the size of the proposed Project footprint (by reducing the maximum lake surface area) and would result in less modifications to the spillway and Frazier Dike. However, potential impacts associated with noise would still occur, but would be reduced because of the decreased footprint of construction and operational activities. As such, the noise impacts of the 4-foot Gross Pool Elevation Raise Alternative are less than the proposed Project.

14. **Population/Housing** - A 4-foot gross pool raise would reduce the size of the proposed Project footprint (by reducing the maximum lake surface area) and would result in less modifications to the spillway and Frazier Dike. However, potential impacts to population and housing would still occur, but would be reduced because of the decreased footprint of construction and operational activities. As such, the population and housing impacts of the 4-foot Gross Pool Elevation Raise Alternative are less than the proposed Project.
15. **Public Services** - A 4-foot gross pool raise would reduce the size of the proposed Project footprint (by reducing the maximum lake surface area) and would result in less modifications to the spillway and Frazier Dike. However, potential impacts to public services would still occur, but would be reduced because of the decreased footprint of construction and operational activities. As such, the public services impacts of the 4-foot Gross Pool Elevation Raise Alternative are less than the proposed Project.
16. **Recreation** - A 4-foot gross pool raise would reduce the size of the proposed Project footprint (by reducing the maximum lake surface area) and would result in less modifications to the spillway and Frazier Dike. However, potential impacts to recreation would still occur, but would be reduced because of the decreased footprint of construction and operational activities. One of the Project Objectives of the Project includes an increase in recreational opportunities associated with the proposed lake capacity expansion and related recreational improvements identified in Chapter Two – Project Description. Under the 4-foot Groos Pool Elevation Raise Alternative, there would be less surface area of the lake available for recreational activities. Therefore, the recreation impacts of the 4-foot Gross Pool Elevation Raise Alternative are greater than the proposed Project.
17. **Transportation -** A 4-foot gross pool raise would reduce the size of the proposed Project footprint (by reducing the maximum lake surface area) and would result in less modifications to the spillway and Frazier Dike. However, potential impacts to transportation would still occur, but would be reduced because of the decreased footprint of construction and operational activities. As such, the transportation impacts of the 4-foot Gross Pool Elevation Raise Alternative are less than the proposed Project.
18. **Tribal Cultural Resources -** A 4-foot gross pool raise would reduce the size of the proposed Project footprint (by reducing the maximum lake surface area) and would result in less modifications to the spillway and Frazier Dike. However, potential impacts to tribal cultural resources would still occur, but would be reduced because of the decreased footprint of construction and operational activities. As such, the tribal cultural impacts of the 4-foot Gross Pool Elevation Raise Alternative are less than the proposed Project.
19. **Utilities/Service Systems -** A 4-foot gross pool raise would reduce the size of the proposed Project footprint (by reducing the maximum lake surface area) and would result

in less modifications to the spillway and Frazier Dike. However, potential impacts to utilities and service systems would still occur, but would be reduced because of the decreased footprint of construction and operational activities. As such, the utility and service system impacts of the 4-foot Gross Pool Elevation Raise Alternative are less than the proposed Project.

20. **Wildfire** - A 4-foot gross pool raise would reduce the size of the proposed Project footprint (by reducing the maximum lake surface area) and would result in less modifications to the spillway and Frazier Dike. However, potential impacts to wildfire would still occur, but would be reduced because of the decreased footprint of construction and operational activities. As such, the wildfire impacts of the 4-foot Gross Pool Elevation Raise Alternative are less than the proposed Project.

SCE Alternative 2 – Earthen Berm (Transmission Line Structures) Alternative

Description

Transmission Line Route Alternative 2 would remove and replace approximately 2 miles of the existing Magunden-Springville No. 1 and 2 220-kV Transmission Lines within the existing ROW. However, the Berm Alternative proposes construction of two segments of earthen berm along the transmission line. This alternative would require additional ROW to accommodate the earthen berm slope. The Berm Alternative would meet the Project objectives by placing the transmission line structures completely out of the water, allowing access year-round, and preventing direct contact with the structures; however, it would have greater environmental impacts and financial cost.

Environmental Considerations

The Berm Alternative would result in similar environmental impacts to SCE's Proposed Project in all CEQA resource areas except for the following:

1. **Aesthetics –** The Berm Alternative would result in slightly greater potential impacts due to the increased visibility of the earthen berm; however, impacts remain less than significant.
2. **Air Quality –** The Berm Alternative would result in significant impacts related to construction of the berm, including exceedances of thresholds related to nitrogen oxides (NOx), reactive organic gases (ROG), and suspended particulate matter (PM10).

3. **Biology –** The Berm Alternative would result in greater potential impacts, as the construction of the berm would permantenly impact 2.18 acres of jurisdictional waters; however, impacts remain less than significant with incorporation of mitigation measures.
4. **Greenhouse Gases –** The Berm Alternative would result in slightly greater potential impacts due to construction of the berm; however, impacts remain less than significant.
5. **Hydrology and Water Quality –** The Berm Alternative would result in slightly greater potential impacts as construction of the berm places fill within Lake Success; however, impacts remain less than significant.
6. **Recreation –** The Berm Alternative would result in slightly greater potential impacts due to the berm requiring additional ROW; however, impacts remain less than significant.

4.4 Summary of Potential Impacts of Alternatives

Table 4-2 is a generalized comparative assessment of potential impacts of the alternatives.

Table 4-2, Alternatives Potential Impact Analysis Compared to Proposed Project

Environmental Issues	No Project	4-foot Gross Pool Elevation Raise Alternative
Aesthetics	**Less**	**Less**
Agriculture / Forest Resources	**Less**	**Less**
Air Quality	**Less**	**Less**
Biological Resources	**Less**	**Less**
Cultural Resources	**Less**	**Less**
Energy	**Less**	**Less**
Geology and Soils	**Less**	**Less**
Greenhouse Gas Emissions	**Less**	**Less**
Hazards and Hazardous Materials	**Less**	**Less**
Hydrology and Water Quality	**Greater**	**Less**
Land Use / Planning	**Less**	**Less**

Environmental Issues	No Project	4-foot Gross Pool Elevation Raise Alternative
Noise	**Less**	**Less**
Population / Housing	**Less**	**Less**
Public Services	**Less**	**Less**
Recreation	**Greater**	**Greater**
Transportation	**Less**	**Less**
Tribal Cultural Resources	**Less**	**Less**
Utilities and Service Systems	**Less**	**Less**
Wildfire	**Less**	**Less**
Cumulative Impacts	**Less**	**Less**
Impact Reduction	Yes	Yes

Environmentally Superior Alternative and Determination

Based on a review of the alternatives evaluated in this chapter, the No Project Alternative would result in the fewest impacts on the environment. However, the No Project Alternative would not meet the Project objectives, as identified in this chapter.

Apart from the No Project Alternative, the the 4-foot Gross Pool Elevation Raise Alternative would be the Environmentally Superior Alternative because it would result in less adverse physical impacts to the environment with regard to most environmental topics. However, in the 1999 FEIS/FEIR, the Corps evaluated the three reservoir enlargement sizes based on cost, flood protection, irrigation water supply and hyrdo power generation. The 10-foot raise (proposed Project) was selected because it is the plan that reasonably maximizes national economic development benefits and is the Federally supportable plan.

After this full, substantial, and deliberate analysis, the proposed Project remains the preferred alternative.

Chapter 5

CEQA CONSIDERATIONS

CEQA CONSIDERATIONS

5.1 Growth-Inducing Impacts

CEQA Section 15126 (d) requires that any growth-inducing aspect of a project be addressed in an EIR. This discussion includes consideration of ways in which the proposed Project could directly or indirectly foster economic or population growth with the construction and operation of the proposed Project in the surrounding area. Projects which could remove obstacles to population growth (such as a major public service expansion) are also considered in this discussion.

The Project consists of constructing a 10 foot-high concrete ogee weir across the spillway, which would result in raising the maximum gross pool elevation from 655.1 feet to 665.1 feet. Raising the gross pool elevation would add approximately 28,000 acre-feet of joint-use flood control and irrigation water storage space in the reservoir, increasing storage capacity from 82,300 to 110,300 acre-feet. The reservoir surface area would increase from 2,400 to 3,120 acres. Bridge abutments along California Highway 190 will be armored to accommodate the increase in gross pool at the point the highway spans the reservoir. Rock slope protection will be added to Frazier Dike. In addition, Southern California Edison (SCE) will be required to raise the height of an existing transmission line that crosses the lake. This will involve removal of existing towers and installation of new or replacement transmission towers. Some existing SCE distribution poles and facilities will also need to be replaced, removed or relocated as a result of the Project.

The primary purposes of the Project are to increase water storage capacity and to install flood protection measures for Lake Success. Currently, flooding downstream of the Richard L. Shafer Dam can cause extensive damage to residences, agricultural farmland, and public facilities. Under current operations of the existing dam, releases greater than 3,200 cfs have caused damage to downstream agricultural areas. The downstream channel capacity ranges from 10,000 cfs through the City of Porterville to as little as 3,200 cfs west of the city. Agricultural lands west of the City are where property damage and danger to residents have historically occurred, given a release greater than 3,200 cfs (Corps 2011). The existing dam controls downstream flows by making releases through its outlet works. When the reservoir elevation exceeds the emergency spillway crest elevation (currently 655.1 feet, NAVD88), uncontrolled flows are released into the downstream channel. The existing spillway crest elevation corresponds to a flood event with a 2.2% annual chance exceedance (ACE) (approximately, the "46-year flood"). Thus, the current emergency spillway is undersized and not capable of passing the PMF within present freeboard requirements (freeboard is the difference in elevation between the crest of the dam and the normal

reservoir water level as fixed by design requirements). To correct for this, the existing emergency spillway would be widened and raised 10 feet as recommended by the Corps Dam Safety Assurance Program (DSAP; Corps 2011). This would enable the lake to safely store water from a flood event with a 1% ACE (the "100-year flood"). This will reduce the 100-year flood flow through the spillway from approximately 4,700 to 0 cfs, which would eliminate downstream channel capacity issues during such an event.

The proposd Project would create a relatively minor amount of new (temporary) employment opportunities during construction; however, those positions would likely be readily filled by the existing employment base. There are no other aspects of the Project (such as creation of oversized utility lines, zone changes, etc.) that would induce further growth in the area. The proposed Project would not result in significant growth-inducing impacts.

5.2 Irreversible Environmental Changes

CEQA requires that EIRs must include a discussion of significant irreversible environmental changes as a result of project implementation. State CEQA Guidelines Section 15126.2(c) describes irreversible environmental changes as:

> *"Uses of nonrenewable resources during the initial and continued phases of the project may be irreversible since a large commitment of such resources makes removal or nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also irreversible damage can result from environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified."*

Consumption of nonrenewable resources refers to the loss of physical features within the natural environment, including the conversion of open space, sensitive habitats, and nonrenewable energy use. Non-renewable and slowly renewable resources such as electricity, natural gas, propane, gasoline, diesel, oil, sand, gravel, asphalt and concrete, steel, copper, lead and water would be consumed primarily during the construction of the Project. Insignificant amounts of resources would be utilized during operation of the Project (e.g., during routine maintenance activities).

The proposed Project will physically change the environment in terms of aesthetics, air emissions (construction only), hydrology, and natural resources as discussed in Chapters 3.1 through 3.20. While these physical changes may not necessarily be individually significant, these physical changes are irreversible after development occurs. Therefore,

the proposed Project would allow irreversible changes that would involve permanent commitment of resources, including land use (i.e., expanded lake footprint) and energy.

In summary, implementation of the proposed Project would result in a commitment of land uses associated with the expanded water storage capacity of Lake Success. Land use and development of the Project would result in irretrievable commitments by introducing land uses onto sites that are presently undeveloped. The conversion of undeveloped lands to land that could be inundated due to the expanded capacity of the lake would result in an irretrievable loss of open space land, and potential wildlife habitat. These physical changes are irreversible after development occurs. Therefore, the proposed Project would result in changes in land use within the area that would commit future generations to these uses.

The Project includes mitigation measures that are designed to address land use and environmental issues to the greatest extent feasible, while allowing the Project to occur. However, even with mitigation measures that will serve to reduce potential significant impacts, the proposed Project will result in significant irreversible changes. This impact is considered a ***significant and unavoidable*** impact under CEQA.

Appendices

Appendix A

CalEEMod Output Files

Road Construction Emissions Model
Data Entry Worksheet

Version 9.0.0

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells D10 through D24, E28 through G35, and D38 through D41 for all project types.
Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new project.

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

Input Type

Project Name	Tule River, Phase 2 Spillway Raise based on 65% designs, with mitigation	
Construction Start Year	2021	Enter a Year between 2014 and 2040 (inclusive)
Project Type For 4: Other Linear Project Type, please provide project specific off-road equipment population and vehicle trip data	4	1) New Road Construction : Project to build a roadway from bare ground, which generally requires more site preparation than widening an existing roadway 2) Road Widening : Project to add a new lane to an existing roadway 3) Bridge/Overpass Construction : Project to build an elevated roadway, which generally requires some different equipment than a new roadway, such as a crane 4) Other Linear Project Type: Non-roadway project such as a pipeline, transmission line, or levee construction
Project Construction Time	18.00	months
Working Days per Month	22.00	days (assume 22 if unknown)
Predominant Soil/Site Type: Enter 1, 2, or 3 (for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise see instructions provided in cells J18 to J22)	1	1) Sand Gravel : Use for quaternary deposits (Delta/West County) 2) Weathered Rock-Earth : Use for Laguna formation (Jackson Highway area) or the Ione formation (Scott Road, Rancho Murieta) 3) Blasted Rock : Use for Salt Springs Slate or Copper Hill Volcanics (Folsom South of Highway 50, Rancho Murieta)
Project Length	3.50	miles
Total Project Area	50.00	acres
Maximum Area Disturbed/Day	6.00	acres
Water Trucks Used?	1	1. Yes 2. No

Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County.

http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalseries

Material Hauling Quantity Input

Material Type	Phase	Haul Truck Capacity (yd^3) (assume 20 if unknown)	Import Volume (yd^3/day)	Export Volume (yd^3/day)
Soil	Grubbing/Land Clearing	83.00		117.00
	Grading/Excavation	83.00	1571.00	2501.00
	Drainage/Utilities/Sub-Grade			
	Paving			
Asphalt	Grubbing/Land Clearing			
	Grading/Excavation	20.00	131.00	6.00
	Drainage/Utilities/Sub-Grade	20.00	1.00	
	Paving	20.00	427.00	

Mitigation Options

On-road Fleet Emissions Mitigation	2010 and Newer On-road Vehicles Fleet	Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer
Off-road Equipment Emissions Mitigation	Tier 4 Equipment	Select "20% NOx and 45% Exhaust PM reduction" option if the project will be required to use a lower emitting off-road construction fleet. The SMAQMD Construction Mitigation Calculator can be used to confirm compliance with this mitigation measure (http://www.airquality.org/Businesses/CEQA-Land-Use-Planning/Mitigation).
Will all off-road equipment be tier 4?	All Tier 4 Equipment	Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets CARB Tier 4 Standard

The remaining sections of this sheet contain areas that require modification when 'Other Project Type' is selected.

Note: The program's estimates of construction period phase length can be overridden in cells D50 through D53, and F50 through F53.

Construction Periods	User Override of Construction Months	Program Calculated Months	User Override of Phase Starting Date	Program Default Phase Starting Date
Grubbing/Land Clearing	0.30	1.80		1/1/2021
Grading/Excavation	6.70	7.20		1/11/2021
Drainage/Utilities/Sub-Grade	10.00	6.30		8/3/2021
Paving	1.00	2.70		6/4/2022
Totals (Months)	18			

Note: Soil Hauling emission default values can be overridden in cells D61 through D64, and F61 through F64.

Soil Hauling Emissions User Input	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing	7.00			2	14.00
Miles/round trip: Grading/Excavation	7.00			50	350.00
Miles/round trip: Drainage/Utilities/Sub-Grade	0.00		0	0	0.00
Miles/round trip: Paving	0.00		0	0	0.00

2010+ Model Year Mitigation Option Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.04	0.42	3.06	0.11	0.05	0.02	1,779.29	0.00	0.28	1,862.69
Grading/Excavation (grams/mile)	0.04	0.42	3.06	0.11	0.05	0.02	1,779.29	0.00	0.28	1,862.69
Draining/Utilities/Sub-Grade (grams/mile)	0.04	0.42	3.07	0.11	0.05	0.02	1,763.72	0.00	0.28	1,846.38
Paving (grams/mile)	0.04	0.42	3.08	0.11	0.05	0.02	1,748.57	0.00	0.27	1,830.52
Grubbing/Land Clearing (grams/trip)	0.00	0.00	3.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	3.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	3.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	3.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.01	0.11	0.00	0.00	0.00	54.92	0.00	0.01	57.49
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.19
Pounds per day - Grading/Excavation	0.03	0.33	2.75	0.09	0.04	0.01	1,372.94	0.00	0.22	1,437.28
Tons per const. Period - Grading/Excavation	0.00	0.02	0.20	0.01	0.00	0.00	101.19	0.00	0.02	105.93
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.02	0.20	0.01	0.00	0.00	101.37	0.00	0.02	106.12

Note: Asphalt Hauling emission default values can be overridden in cells D91 through D94, and F91 through F94.

Asphalt Hauling Emissions User Input	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing	0.00		0	0	0.00
Miles/round trip: Grading/Excavation	30.00			7	210.00
Miles/round trip: Drainage/Utilities/Sub-Grade	30.00			1	30.00
Miles/round trip: Paving	30.00			22	660.00

2010+ Model Year Mitigation Option Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.04	0.42	3.06	0.11	0.05	0.02	1,779.29	0.00	0.28	1,862.69
Grading/Excavation (grams/mile)	0.04	0.42	3.06	0.11	0.05	0.02	1,779.29	0.00	0.28	1,862.69
Draining/Utilities/Sub-Grade (grams/mile)	0.04	0.42	3.07	0.11	0.05	0.02	1,763.72	0.00	0.28	1,846.38
Paving (grams/mile)	0.04	0.42	3.08	0.11	0.05	0.02	1,748.57	0.00	0.27	1,830.52
Grubbing/Land Clearing (grams/trip)	0.00	0.00	3.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	3.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	3.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	3.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.02	0.20	1.47	0.05	0.02	0.01	823.76	0.00	0.13	862.37
Tons per const. Period - Grading/Excavation	0.00	0.01	0.11	0.00	0.00	0.00	60.71	0.00	0.01	63.56
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.03	0.21	0.01	0.00	0.00	116.65	0.00	0.02	122.12
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.02	0.00	0.00	0.00	12.83	0.00	0.00	13.43
Pounds per day - Paving	0.06	0.62	4.67	0.16	0.07	0.02	2,544.26	0.00	0.40	2,663.51
Tons per const. Period - Paving	0.00	0.01	0.05	0.00	0.00	0.00	27.99	0.00	0.00	29.30
Total tons per construction project	0.00	0.02	0.18	0.01	0.00	0.00	101.53	0.00	0.02	106.29

Note: Worker commute default values can be overridden in cells D121 through D126.

Worker Commute Emissions User Input	User Override of Worker Commute Default Values	Default Values		
Miles/ one-way trip	20		Calculated Daily Trips	Calculated Daily VMT
One-way trips/day	2			
No. of employees: Grubbing/Land Clearing	17		34	680.00
No. of employees: Grading/Excavation	44		88	1,760.00
No. of employees: Drainage/Utilities/Sub-Grade	20		40	800.00
No. of employees: Paving	10		20	400.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.02	1.10	0.10	0.05	0.02	0.00	339.80	0.00	0.01	342.28
Grading/Excavation (grams/mile)	0.02	1.10	0.10	0.05	0.02	0.00	339.80	0.00	0.01	342.28
Draining/Utilities/Sub-Grade (grams/mile)	0.02	1.05	0.09	0.05	0.02	0.00	334.18	0.00	0.01	336.54
Paving (grams/mile)	0.02	1.00	0.08	0.05	0.02	0.00	328.72	0.00	0.01	330.96
Grubbing/Land Clearing (grams/trip)	1.18	2.95	0.34	0.00	0.00	0.00	72.81	0.08	0.04	85.39
Grading/Excavation (grams/trip)	1.18	2.95	0.34	0.00	0.00	0.00	72.81	0.08	0.04	85.39
Draining/Utilities/Sub-Grade (grams/trip)	1.14	2.90	0.33	0.00	0.00	0.00	71.66	0.08	0.03	83.89
Paving (grams/trip)	1.11	2.85	0.32	0.00	0.00	0.00	70.54	0.08	0.03	82.43
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.12	1.87	0.17	0.07	0.03	0.01	514.86	0.01	0.01	519.53
Tons per const. Period - Grubbing/Land Clearing	0.00	0.01	0.00	0.00	0.00	0.00	1.70	0.00	0.00	1.71

Pounds per day - Grading/Excavation	0.31	4.85	0.44	0.18	0.08	0.01	1,332.58	0.03	0.04	1,344.66
Tons per const. Period - Grading/Excavation	0.02	0.36	0.03	0.01	0.01	0.00	98.21	0.00	0.00	99.10
Pounds per day - Drainage/Utilities/Sub-Grade	0.13	2.11	0.19	0.08	0.03	0.01	595.72	0.02	0.02	600.96
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.01	0.23	0.02	0.01	0.00	0.00	65.53	0.00	0.00	66.11
Pounds per day - Paving	0.06	1.01	0.09	0.04	0.02	0.00	292.99	0.01	0.01	295.49
Tons per const. Period - Paving	0.00	0.01	0.00	0.00	0.00	0.00	3.22	0.00	0.00	3.25
Total tons per construction project	0.04	0.61	0.05	0.02	0.01	0.00	168.66	0.00	0.00	170.17

Note: Water Truck default values can be overridden in cells D153 through D156, I153 through I156, and F153 through F156.

Water Truck Emissions	User Override of	Program Estimate of	User Override of Truck	Default Values	Calculated	User Override of	Default Values	Calculated
User Input	Default # Water Trucks	Number of Water Trucks	Round Trips/Vehicle/Day	Round Trips/Vehicle/Day	Trips/day	Miles/Round Trip	Miles/Round Trip	Daily VMT
Grubbing/Land Clearing - Exhaust	3		5.00			8.00		120.00
Grading/Excavation - Exhaust	3		5.00			8.00		120.00
Drainage/Utilities/Subgrade	2		5.00			8.00		80.00
Paving	2		5.00			8.00		80.00

2010+ Model Year Mitigation Option Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.04	0.42	3.06	0.11	0.05	0.02	1,779.29	0.00	0.28	1,862.69
Grading/Excavation (grams/mile)	0.04	0.42	3.06	0.11	0.05	0.02	1,779.29	0.00	0.28	1,862.69
Draining/Utilities/Sub-Grade (grams/mile)	0.04	0.42	3.07	0.11	0.05	0.02	1,763.72	0.00	0.28	1,846.38
Paving (grams/mile)	0.04	0.42	3.08	0.11	0.05	0.02	1,748.57	0.00	0.27	1,830.52
Grubbing/Land Clearing (grams/trip)	0.00	0.00	3.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	3.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	3.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	3.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.01	0.11	0.93	0.03	0.01	0.00	470.72	0.00	0.07	492.78
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	1.55	0.00	0.00	1.63
Pounds per day - Grading/Excavation	0.01	0.11	0.93	0.03	0.01	0.00	470.72	0.00	0.07	492.78
Tons per const. Period - Grading/Excavation	0.00	0.01	0.07	0.00	0.00	0.00	34.69	0.00	0.01	36.32
Pounds per day - Drainage/Utilities/Sub-Grade	0.01	0.07	0.62	0.02	0.01	0.00	311.07	0.00	0.05	325.65
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.01	0.07	0.00	0.00	0.00	34.22	0.00	0.01	35.82
Pounds per day - Paving	0.01	0.07	0.63	0.02	0.01	0.00	308.40	0.00	0.05	322.85
Tons per const. Period - Paving	0.00	0.00	0.01	0.00	0.00	0.00	3.39	0.00	0.00	3.55
Total tons per construction project	0.00	0.02	0.15	0.00	0.00	0.00	73.86	0.00	0.01	77.32

Note: Fugitive dust default values can be overridden in cells D183 through D185.

Fugitive Dust	User Override of Max Acreage Disturbed/Day	Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearing	4.00		40.00	0.13	8.32	0.03
Fugitive Dust - Grading/Excavation	4.00		40.00	2.95	8.32	0.61
Fugitive Dust - Drainage/Utilities/Subgrade	1.00		10.00	1.10	2.08	0.23

Values in cells D195 through D228, D246 through D279, D297 through D330, and D348 through D381 are required when 'Other Project Type' is selected.

Off-Road Equipment Emissions

Grubbing/Land Clearing

Override of Default Number of Vehicles	Default Number of Vehicles	Mitigation Option Override of	Default		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Program-estimate	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00			Tier 4	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.00			Tier 4	Crawler Tractors	0.72	12.54	1.45	0.07	0.07	0.02	2,281.09	0.74	0.02	2,305.68
0.00			Tier 4	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.00			Tier 4	Excavators	0.48	11.75	0.95	0.05	0.04	0.02	1,500.58	0.49	0.01	1,516.76
0.00			Tier 4	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7.00			Tier 4	Signal Boards	0.18	3.64	3.23	0.18	0.17	0.00	345.20	0.04	0.00	346.95
0.00			Tier 4	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment

If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
			pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing	pounds per day	1.38	27.94	5.63	0.30	0.28	0.04	4,126.86	1.26	0.04	4,169.39
Grubbing/Land Clearing	tons per phase	0.00	0.09	0.02	0.00	0.00	0.00	13.62	0.00	0.00	13.76

Grading/Excavation

Override of Default Number of Vehicles	Default Number of Vehicles	Mitigation Option Override of	Default		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Program-estimate	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00			Tier 4	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Tier 4	Cranes	0.35	6.14	0.71	0.04	0.03	0.01	1,117.48	0.36	0.01	1,129.52
3.00			Tier 4	Crawler Tractors	0.72	12.54	1.45	0.07	0.07	0.02	2,281.09	0.74	0.02	2,305.68
0.00			Tier 4	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00			Tier 4	Excavators	0.79	19.59	1.59	0.08	0.07	0.03	2,500.96	0.81	0.02	2,527.93
0.00			Tier 4	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.00			Tier 4	Graders	0.61	10.55	1.22	0.06	0.06	0.02	1,925.05	0.62	0.02	1,945.79
0.00			Tier 4	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.00			Tier 4	Rollers	0.32	7.94	0.64	0.03	0.03	0.01	1,016.36	0.33	0.01	1,027.31
0.00			Tier 4	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.00			Tier 4	Rubber Tired Loaders	0.58	10.05	1.16	0.06	0.05	0.02	1,815.68	0.59	0.02	1,835.29
4.00			Tier 4	Scrapers	1.86	32.31	3.73	0.19	0.17	0.06	5,871.65	1.90	0.05	5,934.95
7.00			Tier 4	Signal Boards	0.18	3.64	3.23	0.18	0.17	0.00	345.20	0.04	0.00	346.95
0.00			Tier 4	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.00			Tier 4	Tractors/Loaders/Backhoes	0.38	9.37	0.76	0.04	0.03	0.01	1,203.60	0.39	0.01	1,216.56
0.00			Tier 4	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment

If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
			pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day

0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation			pounds per day	5.80	112.14	14.48	0.74	0.69	0.19	18,077.07	5.77	0.16	18,269.98
	Grading/Excavation			tons per phase	0.43	8.26	1.07	0.05	0.05	0.01	1,332.28	0.43	0.01	1,346.50

Drainage/Utilities/Subgrade	Default Number of Vehicles	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	*Program-estimate*				pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00			Tier 4	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.00			Tier 4	Air Compressors	0.30	7.33	0.59	0.03	0.03	0.01	1,125.79	0.08	0.01	1,130.20
0.00			Tier 4	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.00			Tier 4	Generator Sets	0.49	12.17	0.99	0.05	0.05	0.02	1,869.11	0.09	0.01	1,875.60
3.00			Tier 4	Graders	0.61	10.55	1.22	0.06	0.06	0.02	1,924.44	0.62	0.02	1,945.17
0.00			Tier 4	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.00			Tier 4	Plate Compactors	0.05	1.09	0.97	0.05	0.05	0.00	103.44	0.01	0.00	103.96
0.00			Tier 4	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.00			Tier 4	Pumps	0.49	12.17	0.99	0.05	0.05	0.02	1,869.11	0.10	0.01	1,875.76
0.00			Tier 4	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.00			Tier 4	Rough Terrain Forklifts	0.32	7.83	0.63	0.03	0.03	0.01	1,001.29	0.32	0.01	1,012.08
0.00			Tier 4	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.00			Tier 4	Scrapers	1.86	32.31	3.73	0.19	0.17	0.06	5,876.48	1.90	0.05	5,939.83
7.00			Tier 4	Signal Boards	0.18	3.64	3.23	0.18	0.17	0.00	345.20	0.04	0.00	346.95
0.00			Tier 4	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.00			Tier 4	Tractors/Loaders/Backhoes	0.38	9.37	0.76	0.04	0.03	0.01	1,204.29	0.39	0.01	1,217.25
0.00			Tier 4	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment	If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab				ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Number of Vehicles		Equipment Tier		Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Drainage/Utilities/Sub-Grade			pounds per day	4.68	96.46	13.11	0.68	0.63	0.16	15,319.13	3.55	0.13	15,446.79
	Drainage/Utilities/Sub-Grade			tons per phase	0.52	10.61	1.44	0.08	0.07	0.02	1,685.10	0.39	0.01	1,699.15

Paving	Default Number of Vehicles	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	*Program-estimate*			Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00			Tier 4	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.00			Tier 4	Pavers	0.43	10.69	0.87	0.04	0.04	0.01	1,365.77	0.44	0.01	1,380.50
3.00			Tier 4	Paving Equipment	0.38	9.30	0.75	0.04	0.03	0.01	1,183.41	0.38	0.01	1,196.18
0.00			Tier 4	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00			Tier 4	Rollers	0.40	9.92	0.80	0.04	0.04	0.01	1,270.52	0.41	0.01	1,284.21
0.00			Tier 4	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7.00			Tier 4	Signal Boards	0.18	3.64	3.23	0.18	0.17	0.00	345.20	0.04	0.00	346.95
0.00			Tier 4	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00			Tier 4	Sweepers/Scrubbers		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.00			Tier 4	Tractors/Loaders/Backhoes		0.38	9.37	0.76	0.04	0.03	0.01	1,204.96	0.39	0.01	1,217.92
0.00			Tier 4	Trenchers		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Welders		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment	If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab					ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Number of Vehicles		Equipment Tier		Type		pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Paving			pounds per day		1.77	42.92	6.42	0.34	0.31	0.06	5,369.85	1.66	0.05	5,425.76
	Paving			tons per phase		0.02	0.47	0.07	0.00	0.00	0.00	59.07	0.02	0.00	59.68
Total Emissions all Phases (tons per construction period) =>						0.97	19.44	2.60	0.13	0.12	0.03	3,090.07	0.84	0.03	3,119.09

Equipment default values for horsepower and hours/day can be overridden in cells D403 through D436 and F403 through F436.

Equipment	User Override of Horsepower	Default Values Horsepower	User Override of Hours/day	Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		78		8
Bore/Drill Rigs		221		8
Cement and Mortar Mixers		9		8
Concrete/Industrial Saws		81		8
Cranes		231		8
Crawler Tractors		212		8
Crushing/Proc. Equipment		85		8
Excavators		158		8
Forklifts		89		8
Generator Sets		84		8
Graders		187		8
Off-Highway Tractors		124		8
Off-Highway Trucks		402		8
Other Construction Equipment		172		8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		168		8
Pavers		130		8
Paving Equipment		132		8
Plate Compactors		8		8
Pressure Washers		13		8
Pumps		84		8
Rollers		80		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		247		8
Rubber Tired Loaders		203		8
Scrapers		367		8
Signal Boards		6		8
Skid Steer Loaders		65		8
Surfacing Equipment		263		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		97		8
Trenchers		78		8
Welders		46		8

END OF DATA ENTRY SHEET

Road Construction Emissions Model, Version 9.0.0

Daily Emission Estimates for -> Tule River, Phase 2 Spillway Raise based on 65% designs, with mitiga

Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	1.51	29.94	6.84	40.41	0.41	40.00	8.64	0.32	8.32	0.05	5,167.36	1.27	0.13	5,239.19
Grading/Excavation	6.17	117.62	20.08	41.09	1.09	40.00	9.15	0.83	8.32	0.23	22,077.07	5.81	0.62	22,407.07
Drainage/Utilities/Sub-Grade	4.83	98.67	14.13	10.79	0.79	10.00	2.75	0.67	2.08	0.17	16,342.57	3.56	0.21	16,495.51
Paving	1.90	44.62	11.81	0.57	0.57	0.00	0.41	0.41	0.00	0.09	8,515.50	1.67	0.50	8,707.60
Maximum (pounds/day)	6.17	117.62	20.08	41.09	1.09	40.00	9.15	0.83	8.32	0.23	22,077.07	5.81	0.62	22,407.07
Total (tons/construction project)	1.01	20.11	3.19	4.36	0.18	4.18	1.01	0.14	0.87	0.04	3,535.48	0.84	0.08	3,578.98

Notes:

Project Start Year ->	2021
Project Length (months) ->	18
Total Project Area (acres) ->	50
Maximum Area Disturbed/Day (acres) ->	6
Water Truck Used? ->	Yes

	Total Material Imported/Exported Volume (yd^3/day)		Daily VMT (miles/day)			
Phase	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	117	0	14	0	680	120
Grading/Excavation	4,072	137	350	210	1,760	120
Drainage/Utilities/Sub-Grade	0	1	0	30	800	80
Paving	0	427	0	660	400	80

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> Tule River, Phase 2 Spillway Raise based on 65% designs, with mitiga

Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.00	0.10	0.02	0.13	0.00	0.13	0.03	0.00	0.03	0.00	17.05	0.00	0.00	15.68
Grading/Excavation	0.45	8.67	1.48	3.03	0.08	2.95	0.67	0.06	0.61	0.02	1,627.08	0.43	0.05	1,498.14
Drainage/Utilities/Sub-Grade	0.53	10.85	1.55	1.19	0.09	1.10	0.30	0.07	0.23	0.02	1,797.68	0.39	0.02	1,646.11
Paving	0.02	0.49	0.13	0.01	0.01	0.00	0.00	0.00	0.00	0.00	93.67	0.02	0.01	86.89
Maximum (tons/phase)	0.53	10.85	1.55	3.03	0.09	2.95	0.67	0.07	0.61	0.02	1797.68	0.43	0.05	1,646.11
Total (tons/construction project)	1.01	20.11	3.19	4.36	0.18	4.18	1.01	0.14	0.87	0.04	3535.48	0.84	0.08	3,246.83

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

Grubbing/Land Clearing

Equipment Type	Number of Vehicles	Tier	HP	Load Factor (%)	Hours Per Day	Emission Factor (g/bhp-hr) ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	Emission Factor Data Source

Grading/Excavation

Equipment Type	Number of Vehicles	Tier	HP	Load Factor (%)	Hours Per Day	Emission Factor (g/bhp-hr) ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	Emission Factor Data Source

Drainage/Utilities/Subgrade

Equipment Type	Number of Vehicles	Tier	HP	Load Factor (%)	Hours Per Day	Emission Factor (g/bhp-hr) ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	Emission Factor Data Source

Paving

Equipment Type	Number of Vehicles	Tier	HP	Load Factor (%)	Hours Per Day	Emission Factor (g/bhp-hr) ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	Emission Factor Data Source

Year	ROG	Weighted - Grubbing	Weighted - Grading	Weighted - Drainage	Weighted - Paving	CO	Weighted - Grubbing	Weighted - Grading	Weighted - Drainage	Weighted - Paving	NOx
2014	0.0704	-	-	-	-	2.5553	-	-	-	-	0.2855
2015	0.0597	-	-	-	-	2.2699	-	-	-	-	0.2490
2016	0.0491	-	-	-	-	1.9702	-	-	-	-	0.2095
2017	0.0405	-	-	-	-	1.7329	-	-	-	-	0.1791
2018	0.0335	-	-	-	-	1.5296	-	-	-	-	0.1530
2019	0.0279	-	-	-	-	1.3662	-	-	-	-	0.1307
2020	0.0236	-	-	-	-	1.2220	-	-	-	-	0.1123
2021	0.0204	0.0204	0.0204	0.0101	-	1.1018	1.1018	1.1018	0.5433	-	0.0968
2022	0.0178	-	-	0.0090	0.0178	1.0001	-	-	0.5069	1.0001	0.0838
2023	0.0154	-	-	-	-	0.9126	-	-	-	-	0.0726
2024	0.0134	-	-	-	-	0.8386	-	-	-	-	0.0632
2025	0.0117	-	-	-	-	0.7754	-	-	-	-	0.0554
2026	0.0103	-	-	-	-	0.7225	-	-	-	-	0.0491
2027	0.0091	-	-	-	-	0.6774	-	-	-	-	0.0437
2028	0.0081	-	-	-	-	0.6398	-	-	-	-	0.0393
2029	0.0072	-	-	-	-	0.6075	-	-	-	-	0.0355
2030	0.0065	-	-	-	-	0.5801	-	-	-	-	0.0324
2031	0.0059	-	-	-	-	0.5565	-	-	-	-	0.0297
2032	0.0053	-	-	-	-	0.5366	-	-	-	-	0.0275
2033	0.0048	-	-	-	-	0.5196	-	-	-	-	0.0257
2034	0.0044	-	-	-	-	0.5049	-	-	-	-	0.0242
2035	0.0041	-	-	-	-	0.4922	-	-	-	-	0.0229
2036	0.0037	-	-	-	-	0.4811	-	-	-	-	0.0219
2037	0.0035	-	-	-	-	0.4719	-	-	-	-	0.0211
2038	0.0033	-	-	-	-	0.4637	-	-	-	-	0.0203
2039	0.0030	-	-	-	-	0.4566	-	-	-	-	0.0197
2040	0.0029	-	-	-	-	0.4506	-	-	-	-	0.0191
2041	0.0027					0.4452					0.0187
2042	0.0026					0.4404					0.0183
2043	0.0025					0.4367					0.0180
2044	0.0024					0.4339					0.0178
2045	0.0023					0.4317					0.0177
2046	0.0023					0.4300					0.0176
2047	0.0023					0.4286					0.0175
2048	0.0023					0.4274					0.0174
2049	0.0022					0.4268					0.0174
2050	0.0022					0.4264					0.0174
Total		0.0204	0.0204	0.0191	0.0178		1.1018	1.1018	1.0503	1.0001	

Heavy-Heavy Duty Diesel Truck

Water Truck Commute Emissions (EMFAC2017 - web 1.0.2, T7 Single Unit Construction Truck)

Year	ROG	Weighted-Grubbing	Weighted - Grading	Weighted - Drainage	Weighted - Paving	CO	Weighted-Grubbing	Weighted - Grading	Weighted - Drainage	Weighted - Paving	NOx
2014	1.8521	-	-	-	-	4.0026	-	-	-	-	15.4709
2015	1.5946	-	-	-	-	3.4621	-	-	-	-	13.7491
2016	1.2921	-	-	-	-	2.8379	-	-	-	-	11.7429
2017	1.0636	-	-	-	-	2.3588	-	-	-	-	10.5229
2018	0.9069	-	-	-	-	2.0416	-	-	-	-	9.6970
2019	0.7863	-	-	-	-	1.7985	-	-	-	-	9.0623
2020	0.5270	-	-	-	-	1.2976	-	-	-	-	7.5546
2021	0.4260	0.4260	0.4260	0.2101	-	1.1373	1.1373	1.1373	0.5609	-	6.4922
2022	0.1785	-	-	0.0905	0.1785	0.6644	-	-	0.3368	0.6644	4.7102
2023	0.0441	-	-	-	-	0.4262	-	-	-	-	3.5373
2024	0.0423	-	-	-	-	0.4266	-	-	-	-	3.4943
2025	0.0406	-	-	-	-	0.4273	-	-	-	-	3.4600
2026	0.0391	-	-	-	-	0.4279	-	-	-	-	3.4290
2027	0.0378	-	-	-	-	0.4281	-	-	-	-	3.4003
2028	0.0367	-	-	-	-	0.4288	-	-	-	-	3.3809
2029	0.0359	-	-	-	-	0.4297	-	-	-	-	3.3699
2030	0.0351	-	-	-	-	0.4306	-	-	-	-	3.3633
2031	0.0345	-	-	-	-	0.4315	-	-	-	-	3.3580
2032	0.0339	-	-	-	-	0.4322	-	-	-	-	3.3517
2033	0.0334	-	-	-	-	0.4325	-	-	-	-	3.3446
2034	0.0330	-	-	-	-	0.4325	-	-	-	-	3.3345
2035	0.0326	-	-	-	-	0.4321	-	-	-	-	3.3228
2036	0.0323	-	-	-	-	0.4320	-	-	-	-	3.3141
2037	0.0321	-	-	-	-	0.4317	-	-	-	-	3.3050
2038	0.0319	-	-	-	-	0.4314	-	-	-	-	3.2967
2039	0.0317	-	-	-	-	0.4312	-	-	-	-	3.2899
2040	0.0315	-	-	-	-	0.4308	-	-	-	-	3.2821
2041	0.0314					0.4305					3.2754
2042	0.0313					0.4302					3.2703
2043	0.0312					0.4300					3.2653
2044	0.0311					0.4298					3.2610
2045	0.0310					0.4296					3.2578
2046	0.0309					0.4295					3.2551
2047	0.0309					0.4294					3.2533
2048	0.0309					0.4293					3.2519
2049	0.0309					0.4292					3.2510
2050	0.0308					0.4292					3.2504

Total		0.4260	0.4260	0.3006	0.1785		1.1373	1.1373	0.8976	0.6644	

Year	ROG	Weighted - Grubbing	Weighted - Grading	Weighted - Drainage	Weighted - Paving	CO	Weighted - Grubbing	Weighted - Grading	Weighted - Drainage	Weighted - Paving	NOx
2014	0.0055	-	-	-	-	0.5214	-	-	-	-	0.0236
2015	0.0055	-	-	-	-	0.5173	-	-	-	-	0.0237
2016	0.0055	-	-	-	-	0.5163	-	-	-	-	0.0238
2017	0.0056	-	-	-	-	0.5153	-	-	-	-	0.0239
2018	0.0056	-	-	-	-	0.5147	-	-	-	-	0.0239
2019	0.0055	-	-	-	-	0.5170	-	-	-	-	0.0236
2020	0.0054	-	-	-	-	0.5158	-	-	-	-	0.0232
2021	0.0052	0.0052	0.0052	0.0026	-	0.5136	0.5136	0.5136	0.2533	-	0.0226
2022	0.0051	-	-	0.0026	0.0051	0.5106	-	-	0.2588	0.5106	0.0220
2023	0.0049	-	-	-	-	0.5066	-	-	-	-	0.0213
2024	0.0047	-	-	-	-	0.5012	-	-	-	-	0.0205
2025	0.0044	-	-	-	-	0.4942	-	-	-	-	0.0199
2026	0.0042	-	-	-	-	0.4875	-	-	-	-	0.0193
2027	0.0040	-	-	-	-	0.4813	-	-	-	-	0.0188
2028	0.0038	-	-	-	-	0.4755	-	-	-	-	0.0184
2029	0.0036	-	-	-	-	0.4701	-	-	-	-	0.0181
2030	0.0035	-	-	-	-	0.4650	-	-	-	-	0.0178
2031	0.0033	-	-	-	-	0.4603	-	-	-	-	0.0175
2032	0.0032	-	-	-	-	0.4560	-	-	-	-	0.0174
2033	0.0030	-	-	-	-	0.4521	-	-	-	-	0.0172
2034	0.0029	-	-	-	-	0.4485	-	-	-	-	0.0171
2035	0.0028	-	-	-	-	0.4452	-	-	-	-	0.0171
2036	0.0027	-	-	-	-	0.4423	-	-	-	-	0.0170
2037	0.0026	-	-	-	-	0.4397	-	-	-	-	0.0170
2038	0.0026	-	-	-	-	0.4375	-	-	-	-	0.0171
2039	0.0025	-	-	-	-	0.4355	-	-	-	-	0.0171
2040	0.0024	-	-	-	-	0.4338	-	-	-	-	0.0171
2041	0.0024					0.4323					0.0171
2042	0.0024					0.4310					0.0172
2043	0.0023					0.4300					0.0172
2044	0.0023					0.4291					0.0173
2045	0.0023					0.4283					0.0173
2046	0.0023					0.4277					0.0173
2047	0.0023					0.4272					0.0174
2048	0.0022					0.4268					0.0174
2049	0.0022					0.4265					0.0174
2050	0.0022					0.4262					0.0174
Total		0.0052	0.0052	0.0052	0.0051		0.5136	0.5136	0.5120	0.5106	

Heavy-Heavy Duty Diesel Truck

Water Truck Commute Emissions (EMFAC2017 - web 1.0.2, T7 Single Unit Construction Truck)

Year	ROG	Weighted-Grubbing	Weighted - Grading	Weighted - Drainage	Weighted - Paving	CO	Weighted-Grubbing	Weighted - Grading	Weighted - Drainage	Weighted - Paving	NOx
2014	0.0583	-	-	-	-	0.4129	-	-	-	-	2.9101
2015	0.0529	-	-	-	-	0.4082	-	-	-	-	2.8491
2016	0.0508	-	-	-	-	0.4094	-	-	-	-	2.8549
2017	0.0476	-	-	-	-	0.4102	-	-	-	-	2.8769
2018	0.0457	-	-	-	-	0.4130	-	-	-	-	2.9175
2019	0.0444	-	-	-	-	0.4157	-	-	-	-	2.9546
2020	0.0425	-	-	-	-	0.4199	-	-	-	-	3.0272
2021	0.0418	0.0418	0.0418	0.0206	-	0.4228	0.4228	0.4228	0.2085	-	3.0635
2022	0.0402	-	-	0.0204	0.0402	0.4233	-	-	0.2145	0.4233	3.0792
2023	0.0291	-	-	-	-	0.4046	-	-	-	-	2.9826
2024	0.0294	-	-	-	-	0.4082	-	-	-	-	3.0228
2025	0.0296	-	-	-	-	0.4118	-	-	-	-	3.0634
2026	0.0298	-	-	-	-	0.4149	-	-	-	-	3.0980
2027	0.0300	-	-	-	-	0.4172	-	-	-	-	3.1232
2028	0.0302	-	-	-	-	0.4197	-	-	-	-	3.1503
2029	0.0303	-	-	-	-	0.4221	-	-	-	-	3.1777
2030	0.0305	-	-	-	-	0.4243	-	-	-	-	3.2028
2031	0.0306	-	-	-	-	0.4263	-	-	-	-	3.2255
2032	0.0307	-	-	-	-	0.4279	-	-	-	-	3.2430
2033	0.0308	-	-	-	-	0.4291	-	-	-	-	3.2559
2034	0.0309	-	-	-	-	0.4297	-	-	-	-	3.2619
2035	0.0309	-	-	-	-	0.4299	-	-	-	-	3.2635
2036	0.0309	-	-	-	-	0.4301	-	-	-	-	3.2652
2037	0.0309	-	-	-	-	0.4302	-	-	-	-	3.2648
2038	0.0309	-	-	-	-	0.4301	-	-	-	-	3.2639
2039	0.0309	-	-	-	-	0.4301	-	-	-	-	3.2635
2040	0.0309	-	-	-	-	0.4300	-	-	-	-	3.2612
2041	0.0309					0.4298					3.2588
2042	0.0309					0.4297					3.2571
2043	0.0308					0.4295					3.2551
2044	0.0308					0.4294					3.2535
2045	0.0308					0.4294					3.2526
2046	0.0308					0.4293					3.2514
2047	0.0308					0.4292					3.2507
2048	0.0308					0.4292					3.2500
2049	0.0308					0.4291					3.2496
2050	0.0308					0.4291					3.2496

Total		0.0418	0.0418	0.0410	0.0402		0.4228	0.4228	0.4230	0.4233	

	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
5	Emissions (g/bhp-hr)		ROG	ROG	ROG	ROG		CO	CO	CO	CO		NOx	NOx	NOx	NOx		PM10	PM10	PM10	PM10
6	Aerial Lifts		Weighted - Grubbing	Weighted - Grading	Weighted - Drainage	Weighted - Paving		Weighted - Grubbing	Weighted - Grading	Weighted - Drainage	Weighted - Paving		Weighted - Grubbing	Weighted - Grading	Weighted - Drainage	Weighted - Paving		Weighted - Grubbing	Weighted - Grading	Weighted - Drainage	Weighted - Paving
7		ROG					CO					NOx					PM10				
8	2014	0.2023	-	-	-	-	3.2195	-	-	-	-	3.3728	-	-	-	-	0.1608	-	-	-	-
9	2015	0.1906	-	-	-	-	3.2178	-	-	-	-	3.1134	-	-	-	-	0.1431	-	-	-	-
10	2016	0.1655	-	-	-	-	3.2010	-	-	-	-	2.7222	-	-	-	-	0.1119	-	-	-	-
11	2017	0.1427	-	-	-	-	3.1843	-	-	-	-	2.3637	-	-	-	-	0.0834	-	-	-	-
12	2018	0.1219	-	-	-	-	3.1669	-	-	-	-	2.0636	-	-	-	-	0.0571	-	-	-	-
13	2019	0.1182	-	-	-	-	3.1725	-	-	-	-	1.9766	-	-	-	-	0.0485	-	-	-	-
14	2020	0.1149	-	-	-	-	3.1768	-	-	-	-	1.8686	-	-	-	-	0.0416	-	-	-	-
15	2021	0.1088	0.1088	0.1088	0.0537	-	3.1762	3.1762	3.1762	1.5664	-	1.7437	1.7437	1.7437	0.8599	-	0.0333	0.0333	0.0333	0.0164	-
16	2022	0.1047	-	-	0.0531	0.1047	3.1760	-	-	1.6098	3.1760	1.6266	-	-	0.8244	1.6266	0.0302	-	-	0.0153	0.0302
17	2023	0.1005	-	-	-	-	3.1703	-	-	-	-	1.5481	-	-	-	-	0.0267	-	-	-	-
18	2024	0.1005	-	-	-	-	3.1726	-	-	-	-	1.5279	-	-	-	-	0.0265	-	-	-	-
19	2025	0.0988	-	-	-	-	3.1674	-	-	-	-	1.5108	-	-	-	-	0.0259	-	-	-	-
20	2026	0.0988	-	-	-	-	3.1674	-	-	-	-	1.5108	-	-	-	-	0.0259	-	-	-	-
21	2027	0.0988	-	-	-	-	3.1674	-	-	-	-	1.5108	-	-	-	-	0.0259	-	-	-	-
22	2028	0.0988	-	-	-	-	3.1674	-	-	-	-	1.5108	-	-	-	-	0.0259	-	-	-	-
23	2029	0.0988	-	-	-	-	3.1674	-	-	-	-	1.5108	-	-	-	-	0.0259	-	-	-	-
24	2030	0.1880	-	-	-	-	3.3520	-	-	-	-	1.6570	-	-	-	-	0.0360	-	-	-	-
25	2031	0.1880	-	-	-	-	3.3520	-	-	-	-	1.6570	-	-	-	-	0.0360	-	-	-	-
26	2032	0.1880	-	-	-	-	3.3520	-	-	-	-	1.6570	-	-	-	-	0.0360	-	-	-	-
27	2033	0.1880	-	-	-	-	3.3520	-	-	-	-	1.6570	-	-	-	-	0.0360	-	-	-	-
28	2034	0.1880	-	-	-	-	3.3520	-	-	-	-	1.6570	-	-	-	-	0.0360	-	-	-	-
29	2035	0.1660	-	-	-	-	3.3450	-	-	-	-	1.4660	-	-	-	-	0.0170	-	-	-	-
30	2036	0.1660	-	-	-	-	3.3450	-	-	-	-	1.4660	-	-	-	-	0.0170	-	-	-	-
31	2037	0.1660	-	-	-	-	3.3450	-	-	-	-	1.4660	-	-	-	-	0.0170	-	-	-	-
32	2038	0.1660	-	-	-	-	3.3450	-	-	-	-	1.4660	-	-	-	-	0.0170	-	-	-	-
33	2039	0.1660	-	-	-	-	3.3450	-	-	-	-	1.4660	-	-	-	-	0.0170	-	-	-	-
34	2040	0.1610	-	-	-	-	3.3440	-	-	-	-	1.4070	-	-	-	-	0.0120	-	-	-	-
35	Aerial Lifts Total		0.1088	0.1088	0.1067	0.1047		3.1762	3.1762	3.1761	3.1760		1.7437	1.7437	1.6843	1.6266		0.0333	0.0333	0.0317	0.0302

Off-road Equipment Tier 4 Emission Factors

HP Bin		Emission Factor (g/bhp-hr)				
Low HP	High HP	ROG	CO	NOx	PM10	PM2.5
0	11	0.30	6.00	5.32	0.30	0.28
11	25	0.30	4.90	5.32	0.30	0.28
25	50	0.19	4.10	3.33	0.02	0.02
50	75	0.19	3.70	3.33	0.02	0.02
75	100	0.15	3.70	0.30	0.02	0.01
100	175	0.15	3.70	0.30	0.02	0.01
175	300	0.15	2.60	0.30	0.02	0.01
300	600	0.15	2.60	0.30	0.02	0.01
600	750	0.15	2.60	0.30	0.02	0.01
750	1200	0.15	2.60	2.60	0.03	0.03
1200	9999	0.15	2.60	2.60	0.03	0.03

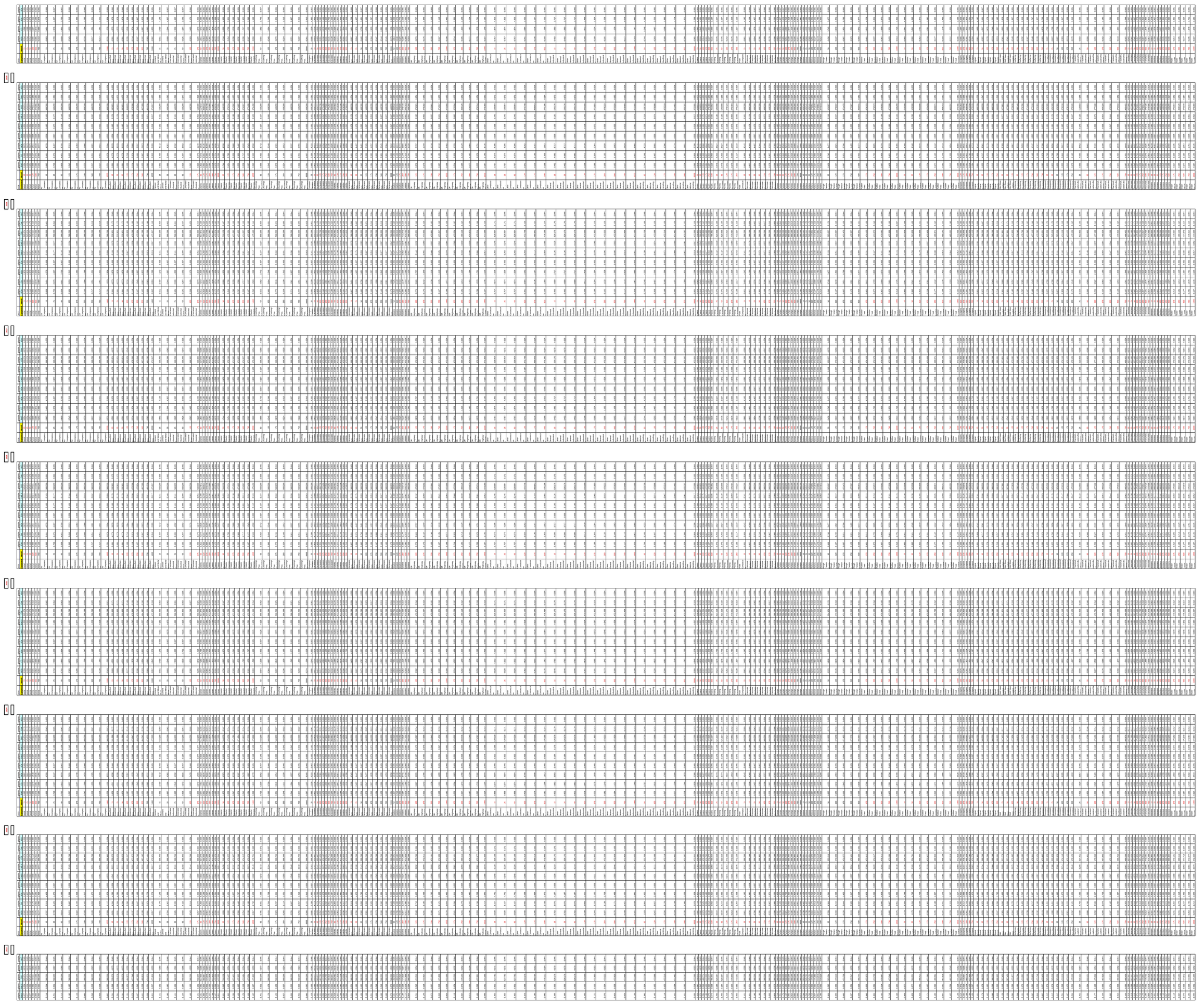
92 % of PM2.5 in PM10 (from CEIDARS)
95 % of NOx in NMHC+NOx (from http://www.arb.ca.gov/msprog/moyer/guidelines/2005_Carl_Moyer_Guidelines_Part4.pdf)
1.07 VOC/NMHC

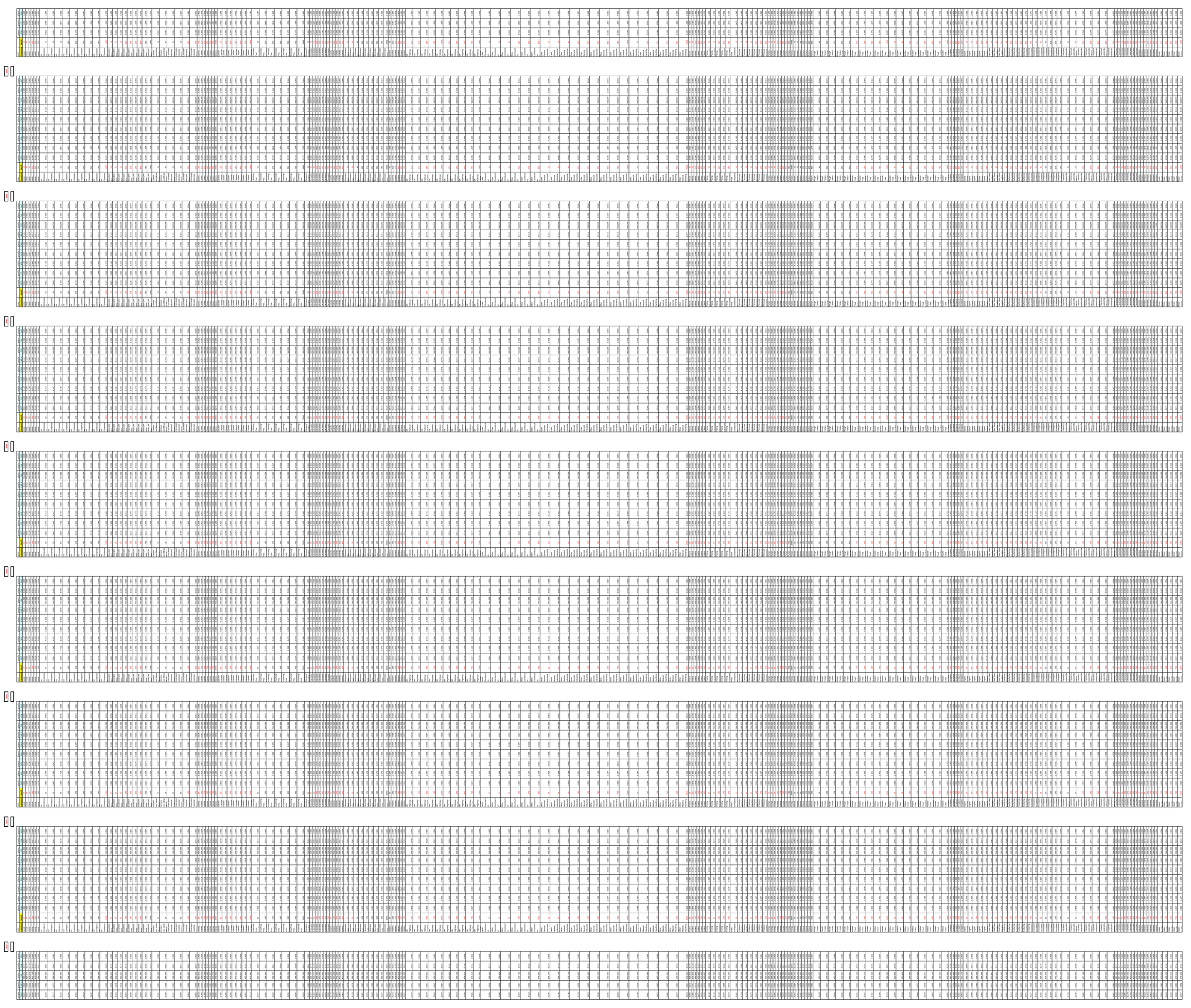
Note:
1. Tier 4 Emission Factors are converted from EPA Non-road Diesel Engine Standards. Available at www.arb.ca.gov/msprog/ordiesel/documents/Off-Road_Diesel_Stds.xls
2. Assume PM2.5 is 92% of PM10.

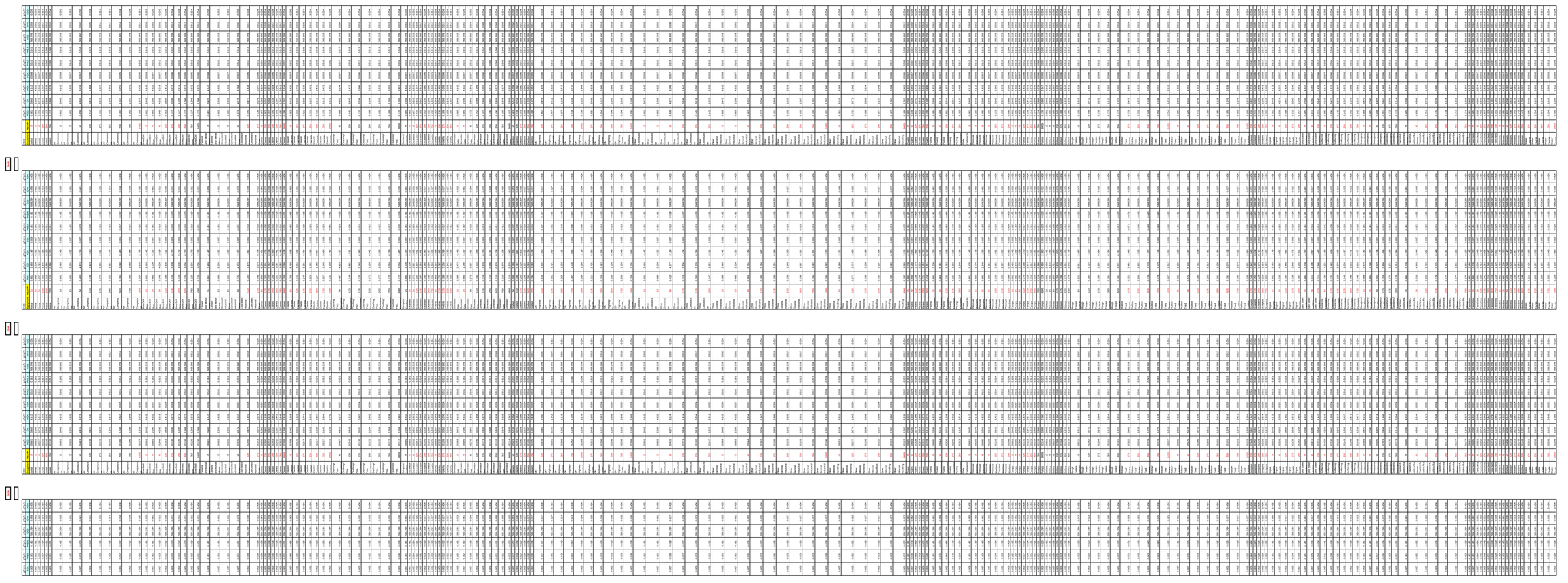
Default Horsepower and Load Factor

OFFROAD Equipment Type	Horsepower	Load Factor
Aerial Lifts	63	0.31
Air Compressors	78	0.48
Bore/Drill Rigs	221	0.5
Cement and Mortar Mixers	9	0.56
Concrete/Industrial Saws	81	0.73
Cranes	231	0.29
Crawler Tractors	212	0.43
Crushing/Proc. Equipment	85	0.78
Excavators	158	0.38
Forklifts	89	0.2
Generator Sets	84	0.74
Graders	187	0.41
Off-Highway Tractors	124	0.44
Off-Highway Trucks	402	0.38
Other Construction Equipment	172	0.42
Other General Industrial Equipment	88	0.34
Other Material Handling Equipment	168	0.4
Pavers	130	0.42
Paving Equipment	132	0.36
Plate Compactors	8	0.43
Pressure Washers	13	0.3
Pumps	84	0.74
Rollers	80	0.38
Rough Terrain Forklifts	100	0.4
Rubber Tired Dozers	247	0.4
Rubber Tired Loaders	203	0.36
Scrapers	367	0.48
Signal Boards	6	0.82
Skid Steer Loaders	65	0.37
Surfacing Equipment	263	0.3
Sweepers/Scrubbers	64	0.46
Tractors/Loaders/Backhoes	97	0.37
Trenchers	78	0.5
Welders	46	0.45

Default Horsepower and Load Factor from CalEEMod2016 Appendix D: Table 3.3







Basic Conversions	Factor	Value	Units	Source
	1 pound equals	453.592	grams	
	1 MT equals	1.102	tons	
	Total # of days in a week	7	days	
	1 kg equals	1,000	grams	
	1 Year equals	365	days	
	1 ton equals	2,000	pounds	
	Global Warming Potential of CH4	25	N/A	http://www.arb.ca.gov/cc/inventory/background/gwp.htm
	Global Warming Potential of N2O	298	N/A	http://www.arb.ca.gov/cc/inventory/background/gwp.htm

Lake Success Transmission Project

From "SJVAPCD Guidance for Assessing and Mitigating Air Quality Impacts, March 19, 2015"
Page 80, "Table 2: Air Quality Thresholds of Significance - Criteria Pollutants"

Criteria Pollutant	Rolling 12-Month Construction Emissions Threshold (tons/year)	Lake Success (tons/year)	Significant?
CO	100	2.1	No
NOX	10	1.8	No
ROG	10	0.4	No
SOX	27	0.0	No
PM10	15	7.2	No
PM2.5	15	0.8	No

Greenhouse Gas	Total Construction Activity (tons)
CO2	568.40
CH4	0.03

568.44

Emission estimates prepared by A.L. Wilson, WE Associates, October 2020, 714-915-1525, alwilson@iaq.com

Lake Success Transmission Project

Estimated Monthly Emissions
Based on a 15 month construction period, 5 days per week

Work Activity	Duration (days)	Activity Total Emissions (lbs) Exhaust ROG	CO	NOX	SOX	PM10	PM2.5	CO2	CH4	Fugitive Particulate PM10	PM2.5	Total Particulate PM10	PM2.5
Staging/Material Yard (1)	285	187	1371	1005	3	47	36	256541	16	5098	516	5145	552
Transmission Survey (2) 5 Miles	5	1	6	1	0	0	0	1676	0	46	5	46	5
Transmission Road & Structure Pad Work (3) 6 Miles 33 Pads	15	30	197	174	1	8	7	48711	3	1703	175	1711	182
Transmission Guard Structure Installation (4) 4 Structures	2	3	15	14	0	1	0	4853	0	50	4	50	4
Transmission Shoofly Pole Haul (5) 36 Poles	6	3	16	16	0	1	1	4910	0	63	7	64	7
Transmission Shoofly Wood/Wood Equivalent Pole Assembly (6) 36 Poles	13	16	91	94	0	4	3	22870	1	144	15	148	18
Transmission Shoofly Wood/Wood Equivalent Pole Installation (7) 36 Pol	18	21	143	111	0	5	4	40638	2	569	39	574	43
Transmission Shoofly Conductor & GW Installation (8) 84,000 Feet	12	93	338	352	38	14	11	111259	10	885	82	899	93
Transmission Remove Existing Conductor & GW (9) 105,000 Feet	14	50	260	288	1	12	9	87978	4	309	32	321	41
Transmission LST Removal (10) 15 Towers	21	25	133	138	0	6	5	35311	2	349	36	355	41
Transmission LST Foundation Removal (11) 15 Towers	12	10	77	49	0	3	2	14857	1	623	47	626	49
Transmission Install H-Frame Hybrid Foundations (12) 14 Structures	38	46	307	246	1	11	8	105780	3	2347	226	2358	234
Transmission H-Frame Hybrid Haul (13) 14 Structures	5	2	13	13	0	1	0	4041	0	53	5	53	6
Transmission H-Frame Hybrid Assembly (14) 14 Structures	14	17	95	99	0	4	4	24159	2	182	19	186	22
Transmission H-Frame Hybrid Erection (15) 14 Structures	14	20	117	118	0	5	4	30052	2	173	18	178	22
Transmission Install Conductor & GW (16) 105,000 Feet	14	149	591	606	51	25	20	192766	15	1054	101	1078	121
Transmission Shoofly Conductor/GW Removal (17) 84,000 Feet	11	38	212	207	1	9	7	67766	3	271	28	280	35
Transmission Shoofly Pole Removal (18) 36 Poles	9	10	55	58	0	3	2	15066	1	149	15	152	17
Transmission Guard Structure Removal (19) 4 Structures	1	1	6	6	0	0	0	1674	0	17	2	17	2
Transmission Restoration (20) 3 Miles	6	6	39	33	0	2	1	10661	1	305	23	306	24
Distribution Survey (21) 15 Removed/22 Removed and Replaced	5	1	6	1	0	0	0	1676	0	46	5	46	5
Distribution Remove Existing Conductor (22) 3 Miles	4	3	23	12	0	1	1	5406	0	21	2	22	3
Distribution Pole Removal (23) 37 Poles	20	19	135	113	0	6	4	29415	2	248	25	253	30
Distribution Pole Assembly and Set/Replacement (24) 22 Poles	10	5	36	28	0	1	1	7920	0	63	7	65	8
Distribution Install or Transfer Conductor (25) 3 Miles	11	3	23	12	0	1	1	5406	0	31	3	31	4
Distribution Restoration (26) 37 Sites	5	3	25	13	0	1	1	5410	0	237	17	238	18
Sum	285	760	4328	3806	98	170	134	1136801	70	15032	1453	15202	1586

Work Activity	Sum	Assumed Activity Days Per Month (15 month schedule) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Staging/Material Yard (1)	285	20	20	20	20	20	20	20	20	20	20	20	20	20	20	5
Transmission Survey (2) 5 Miles	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transmission Road & Structure Pad Work (3) 6 Miles 33 Pads	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transmission Guard Structure Installation (4) 4 Structures	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Transmission Shoofly Pole Haul (5) 36 Poles	6	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0
Transmission Shoofly Wood/Wood Equivalent Pole Assembly (6) 36 Poles	13	0	12	1	0	0	0	0	0	0	0	0	0	0	0	0
Transmission Shoofly Wood/Wood Equivalent Pole Installation (7) 36 Pol	18	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0
Transmission Shoofly Conductor & GW Installation (8) 84,000 Feet	12	0	0	1	11	0	0	0	0	0	0	0	0	0	0	0
Transmission Remove Existing Conductor & GW (9) 105,000 Feet	14	0	0	0	9	5	0	0	0	0	0	0	0	0	0	0
Transmission LST Removal (10) 15 Towers	21	0	0	0	0	15	6	0	0	0	0	0	0	0	0	0
Transmission LST Foundation Removal (11) 15 Towers	12	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0
Transmission Install H-Frame Hybrid Foundations (12) 14 Structures	38	0	0	0	0	0	2	20	16	0	0	0	0	0	0	0
Transmission H-Frame Hybrid Haul (13) 14 Structures	5	0	0	0	0	0	0	0	4	1	0	0	0	0	0	0
Transmission H-Frame Hybrid Assembly (14) 14 Structures	14	0	0	0	0	0	0	0	0	14	0	0	0	0	0	0
Transmission H-Frame Hybrid Erection (15) 14 Structures	14	0	0	0	0	0	0	0	0	5	9	0	0	0	0	0
Transmission Install Conductor & GW (16) 105,000 Feet	14	0	0	0	0	0	0	0	0	0	11	3	0	0	0	0
Transmission Shoofly Conductor/GW Removal (17) 84,000 Feet	11	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0
Transmission Shoofly Pole Removal (18) 36 Poles	9	0	0	0	0	0	0	0	0	0	0	6	3	0	0	0
Transmission Guard Structure Removal (19) 4 Structures	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Transmission Restoration (20) 3 Miles	6	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0
Distribution Survey (21) 15 Removed/22 Removed and Replaced	5	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0
Distribution Remove Existing Conductor (22) 3 Miles	4	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0
Distribution Pole Removal (23) 37 Poles	20	0	0	0	0	0	0	0	0	0	0	0	1	19	0	0
Distribution Pole Assembly and Set/Replacement (24) 22 Poles	10	0	0	0	0	0	0	0	0	0	0	0	0	1	9	0
Distribution Install or Transfer Conductor (25) 3 Miles	11	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0
Distribution Restoration (26) 37 Sites	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Sum	285	20	20	20	20	20	20	20	20	20	20	20	20	20	20	5

Work Activity	ACTIVITY FRACTION 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Sum
Staging/Material Yard (1)	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.018	1.00
Transmission Survey (2) 5 Miles	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00
Transmission Road & Structure Pad Work (3) 6 Miles 33 Pads	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00
Transmission Guard Structure Installation (4) 4 Structures	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00
Transmission Shoofly Pole Haul (5) 36 Poles	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00
Transmission Shoofly Wood/Wood Equivalent Pole Assembly (6) 36 Poles	0	0.923	0.077	0	0	0	0	0	0	0	0	0	0	0	0	1.00
Transmission Shoofly Wood/Wood Equivalent Pole Installation (7) 36 Pol	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1.00
Transmission Shoofly Conductor & GW Installation (8) 84,000 Feet	0	0	0.083	0.917	0	0	0	0	0	0	0	0	0	0	0	1.00
Transmission Remove Existing Conductor & GW (9) 105,000 Feet	0	0	0	0.643	0.357	0	0	0	0	0	0	0	0	0	0	1.00
Transmission LST Removal (10) 15 Towers	0	0	0	0	0.714	0.286	0	0	0	0	0	0	0	0	0	1.00
Transmission LST Foundation Removal (11) 15 Towers	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1.00
Transmission Install H-Frame Hybrid Foundations (12) 14 Structures	0	0	0	0	0	0.053	0.526	0.421	0	0	0	0	0	0	0	1.00
Transmission H-Frame Hybrid Haul (13) 14 Structures	0	0	0	0	0	0	0	0.8	0.2	0	0	0	0	0	0	1.00
Transmission H-Frame Hybrid Assembly (14) 14 Structures	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1.00
Transmission H-Frame Hybrid Erection (15) 14 Structures	0	0	0	0	0	0	0	0	0.357	0.643	0	0	0	0	0	1.00
Transmission Install Conductor & GW (16) 105,000 Feet	0	0	0	0	0	0	0	0	0	0.786	0.214	0	0	0	0	1.00
Transmission Shoofly Conductor/GW Removal (17) 84,000 Feet	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1.00
Transmission Shoofly Pole Removal (18) 36 Poles	0	0	0	0	0	0	0	0	0	0	0.667	0.333	0	0	0	1.00
Transmission Guard Structure Removal (19) 4 Structures	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1.00
Transmission Restoration (20) 3 Miles	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1.00
Distribution Survey (21) 15 Removed/22 Removed and Replaced	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1.00
Distribution Remove Existing Conductor (22) 3 Miles	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1.00
Distribution Pole Removal (23) 37 Poles	0	0	0	0	0	0	0	0	0	0	0	0.05	0.95	0	0	1.00
Distribution Pole Assembly and Set/Replacement (24) 22 Poles	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.9	0	1.00
Distribution Install or Transfer Conductor (25) 3 Miles	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1.00
Distribution Restoration (26) 37 Sites	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.00

Work Activity	Monthly ROG (lbs) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Sum
Staging/Material Yard (1)	13	13	13	13	13	13	13	13	13	13	13	13	13	13	3	187
Transmission Survey (2) 5 Miles	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Transmission Road & Structure Pad Work (3) 6 Miles 33 Pads	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30
Transmission Guard Structure Installation (4) 4 Structures	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Transmission Shoofly Pole Haul (5) 36 Poles	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Transmission Shoofly Wood/Wood Equivalent Pole Assembly (6) 36 Poles	0	15	1	0	0	0	0	0	0	0	0	0	0	0	0	16
Transmission Shoofly Wood/Wood Equivalent Pole Installation (7) 36 Pol	0	0	21	0	0	0	0	0	0	0	0	0	0	0	0	21
Transmission Shoofly Conductor & GW Installation (8) 84,000 Feet	0	0	8	86	0	0	0	0	0	0	0	0	0	0	0	93
Transmission Remove Existing Conductor & GW (9) 105,000 Feet	0	0	0	32	18	0	0	0	0	0	0	0	0	0	0	50
Transmission LST Removal (10) 15 Towers	0	0	0	0	18	7	0	0	0	0	0	0	0	0	0	25
Transmission LST Foundation Removal (11) 15 Towers	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	10
Transmission Install H-Frame Hybrid Foundations (12) 14 Structures	0	0	0	0	0	2	24	19	0	0	0	0	0	0	0	46
Transmission H-Frame Hybrid Haul (13) 14 Structures	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2
Transmission H-Frame Hybrid Assembly (14) 14 Structures	0	0	0	0	0	0	0	0	17	0	0	0	0	0	0	17
Transmission H-Frame Hybrid Erection (15) 14 Structures	0	0	0	0	0	0	0	0	7	13	0	0	0	0	0	20
Transmission Install Conductor & GW (16) 105,000 Feet	0	0	0	0	0	0	0	0	0	117	32	0	0	0	0	149
Transmission Shoofly Conductor/GW Removal (17) 84,000 Feet	0	0	0	0	0	0	0	0	0	0	38	0	0	0	0	38
Transmission Shoofly Pole Removal (18) 36 Poles	0	0	0	0	0	0	0	0	0	0	7	3	0	0	0	10
Transmission Guard Structure Removal (19) 4 Structures	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Transmission Restoration (20) 3 Miles	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	6
Distribution Survey (21) 15 Removed/22 Removed and Replaced	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Distribution Remove Existing Conductor (22) 3 Miles	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3
Distribution Pole Removal (23) 37 Poles	0	0	0	0	0	0	0	0	0	0	0	1	18	0	0	19
Distribution Pole Assembly and Set/Replacement (24) 22 Poles	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	5
Distribution Install or Transfer Conductor (25) 3 Miles	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
Distribution Restoration (26) 37 Sites	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
Sum	44	34	43	131	48	33	37	34	38	143	89	28	31	20	6	760
	733	710	682													
Max 12-month (tons)	0.37															

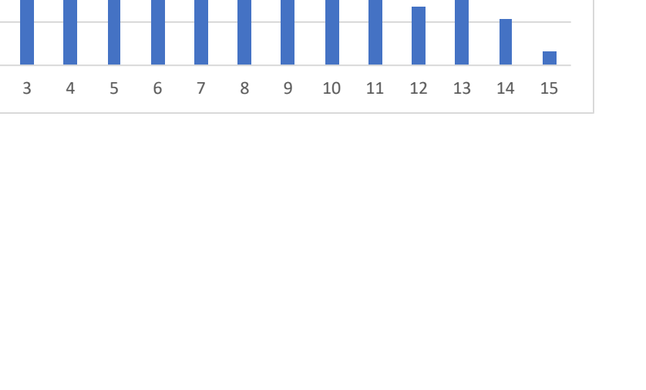
Work Activity	Monthly CO (lbs) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Sum
Staging/Material Yard (1)	96	96	96	96	96	96	96	96	96	96	96	96	96	96	24	1371
Transmission Survey (2) 5 Miles	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
Transmission Road & Structure Pad Work (3) 6 Miles 33 Pads	197	0	0	0	0	0	0	0	0	0	0	0	0	0	0	197
Transmission Guard Structure Installation (4) 4 Structures	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	15
Transmission Shoofly Pole Haul (5) 36 Poles	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	16
Transmission Shoofly Wood/Wood Equivalent Pole Assembly (6) 36 Poles	0	84	7	0	0	0	0	0	0	0	0	0	0	0	0	91
Transmission Shoofly Wood/Wood Equivalent Pole Installation (7) 36 Pol	0	0	143	0	0	0	0	0	0	0	0	0	0	0	0	143
Transmission Shoofly Conductor & GW Installation (8) 84,000 Feet	0	0	28	310	0	0	0	0	0	0	0	0	0	0	0	338
Transmission Remove Existing Conductor & GW (9) 105,000 Feet	0	0	0	167	93	0	0	0	0	0	0	0	0	0	0	260
Transmission LST Removal (10) 15 Towers	0	0	0	0	95	38	0	0	0	0	0	0	0	0	0	133
Transmission LST Foundation Removal (11) 15 Towers	0	0	0	0	0	77	0	0	0	0	0	0	0	0	0	77
Transmission Install H-Frame Hybrid Foundations (12) 14 Structures	0	0	0	0	0	16	162	129	0	0	0	0	0	0	0	307
Transmission H-Frame Hybrid Haul (13) 14 Structures	0	0	0	0	0	0	0	10	3	0	0	0	0	0	0	13
Transmission H-Frame Hybrid Assembly (14) 14 Structures	0	0	0	0	0	0	0	0	95	0	0	0	0	0	0	95
Transmission H-Frame Hybrid Erection (15) 14 Structures	0	0	0	0	0	0	0	0	42	75	0	0	0	0	0	117
Transmission Install Conductor & GW (16) 105,000 Feet	0	0	0	0	0	0	0	0	0	464	127	0	0	0	0	591
Transmission Shoofly Conductor/GW Removal (17) 84,000 Feet	0	0	0	0	0	0	0	0	0	0	212	0	0	0	0	212
Transmission Shoofly Pole Removal (18) 36 Poles	0	0	0	0	0	0	0	0	0	0	36	18	0	0	0	55
Transmission Guard Structure Removal (19) 4 Structures	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	6
Transmission Restoration (20) 3 Miles	0	0	0	0	0	0	0	0	0	0	0	39	0	0	0	39
Distribution Survey (21) 15 Removed/22 Removed and Replaced	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	6
Distribution Remove Existing Conductor (22) 3 Miles	0	0	0	0	0	0	0	0	0	0	0	23	0	0	0	23
Distribution Pole Removal (23) 37 Poles	0	0	0	0	0	0	0	0	0	0	0	7	128	0	0	135
Distribution Pole Assembly and Set/Replacement (24) 22 Poles	0	0	0	0	0	0	0	0	0	0	0	0	4	32	0	36
Distribution Install or Transfer Conductor (25) 3 Miles	0	0	0	0	0	0	0	0	0	0	0	0	0	23	0	23
Distribution Restoration (26) 37 Sites	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	25
Sum	299	210	274	573	284	227	258	236	236	636	471	196	228	151	49	4328
	4128	3980	3819													
Max 12-month (tons)	2.06															

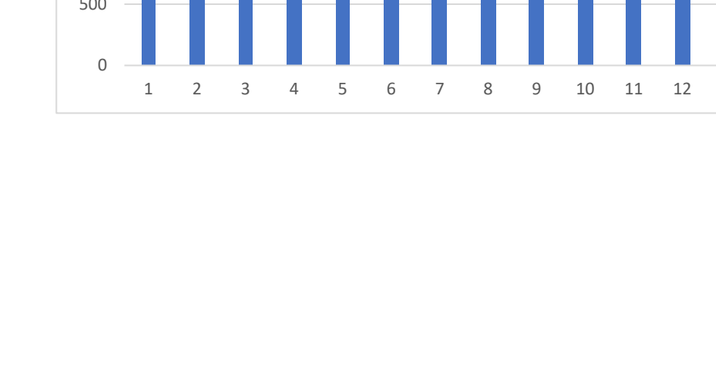
Work Activity	Monthly NOX (lbs) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Sum
Staging/Material Yard (1)	71	71	71	71	71	71	71	71	71	71	71	58	71	71	18	992
Transmission Survey (2) 5 Miles	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Transmission Road & Structure Pad Work (3) 6 Miles 33 Pads	174	0	0	0	0	0	0	0	0	0	0	0	0	0	0	174
Transmission Guard Structure Installation (4) 4 Structures	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	14
Transmission Shoofly Pole Haul (5) 36 Poles	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	16
Transmission Shoofly Wood/Wood Equivalent Pole Assembly (6) 36 Poles	0	87	7	0	0	0	0	0	0	0	0	0	0	0	0	94
Transmission Shoofly Wood/Wood Equivalent Pole Installation (7) 36 Pol	0	0	111	0	0	0	0	0	0	0	0	0	0	0	0	111
Transmission Shoofly Conductor & GW Installation (8) 84,000 Feet	0	0	29	322	0	0	0	0	0	0	0	0	0	0	0	352
Transmission Remove Existing Conductor & GW (9) 105,000 Feet	0	0	0	185	103	0	0	0	0	0	0	0	0	0	0	288
Transmission LST Removal (10) 15 Towers	0	0	0	0	99	40	0	0	0	0	0	0	0	0	0	138
Transmission LST Foundation Removal (11) 15 Towers	0	0	0	0	0	49	0	0	0	0	0	0	0	0	0	49
Transmission Install H-Frame Hybrid Foundations (12) 14 Structures	0	0	0	0	0	13	130	104	0	0	0	0	0	0	0	246
Transmission H-Frame Hybrid Haul (13) 14 Structures	0	0	0	0	0	0	0	11	3	0	0	0	0	0	0	13
Transmission H-Frame Hybrid Assembly (14) 14 Structures	0	0	0	0	0	0	0	0	99	0	0	0	0	0	0	99
Transmission H-Frame Hybrid Erection (15) 14 Structures	0	0	0	0	0	0	0	0	42	76	0	0	0	0	0	118
Transmission Install Conductor & GW (16) 105,000 Feet	0	0	0	0	0	0	0	0	0	476	130	0	0	0	0	606
Transmission Shoofly Conductor/GW Removal (17) 84,000 Feet	0	0	0	0	0	0	0	0	0	0	207	0	0	0	0	207
Transmission Shoofly Pole Removal (18) 36 Poles	0	0	0	0	0	0	0	0	0	0	39	19	0	0	0	58
Transmission Guard Structure Removal (19) 4 Structures	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	6
Transmission Restoration (20) 3 Miles	0	0	0	0	0	0	0	0	0	0	0	33	0	0	0	33
Distribution Survey (21) 15 Removed/22 Removed and Replaced	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Distribution Remove Existing Conductor (22) 3 Miles	0	0	0	0	0	0	0	0	0	0	0	12	0	0	0	12
Distribution Pole Removal (23) 37 Poles	0	0	0	0	0	0	0	0	0	0	0	6	107	0	0	113
Distribution Pole Assembly and Set/Replacement (24) 22 Poles	0	0	0	0	0	0	0	0	0	0	0	0	3	26	0	28
Distribution Install or Transfer Conductor (25) 3 Miles	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0	12
Distribution Restoration (26) 37 Sites	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	13
Sum	245	187	218	578	272	172	200	185	214	622	446	135	181	108	31	3793
	3654	3517	3361													
Max 12-month (tons)	1.83															

Work Activity	Monthly SOX (lbs) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Sum
Staging/Material Yard (1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Transmission Survey (2) 5 Miles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transmission Road & Structure Pad Work (3) 6 Miles 33 Pads	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Transmission Guard Structure Installation (4) 4 Structures	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transmission Shoofly Pole Haul (5) 36 Poles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transmission Shoofly Wood/Wood Equivalent Pole Assembly (6) 36 Poles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transmission Shoofly Wood/Wood Equivalent Pole Installation (7) 36 Pol	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transmission Shoofly Conductor & GW Installation (8) 84,000 Feet	0	0	3	35	0	0	0	0	0	0	0	0	0	0	0	38
Transmission Remove Existing Conductor & GW (9) 105,000 Feet	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Transmission LST Removal (10) 15 Towers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transmission LST Foundation Removal (11) 15 Towers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transmission Install H-Frame Hybrid Foundations (12) 14 Structures	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Transmission H-Frame Hybrid Haul (13) 14 Structures	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transmission H-Frame Hybrid Assembly (14) 14 Structures	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transmission H-Frame Hybrid Erection (15) 14 Structures	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transmission Install Conductor & GW (16) 105,000 Feet	0	0	0	0	0	0	0	0	0	40	11	0	0	0	0	51
Transmission Shoofly Conductor/GW Removal (17) 84,000 Feet	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Transmission Shoofly Pole Removal (18) 36 Poles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transmission Guard Structure Removal (19) 4 Structures	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transmission Restoration (20) 3 Miles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Distribution Survey (21) 15 Removed/22 Removed and Replaced	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Distribution Remove Existing Conductor (22) 3 Miles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Distribution Pole Removal (23) 37 Poles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Distribution Pole Assembly and Set/Replacement (24) 22 Poles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Distribution Install or Transfer Conductor (25) 3 Miles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Distribution Restoration (26) 37 Sites	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sum	1	1	4	36	1	1	1	1	1	41	12	0	1	0	0	98
	98	98	97													
Max 12-month (tons)	0.05															

Work Activity	Monthly Total PM10 (lbs) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Sum
Staging/Material Yard (1)	361	361	361	361	361	361	361	361	361	361	361	361	361	361	90	5145
Transmission Survey (2) 5 Miles	46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46
Transmission Road & Structure Pad Work (3) 6 Miles 33 Pads	1711	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1711
Transmission Guard Structure Installation (4) 4 Structures	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	50
Transmission Shoofly Pole Haul (5) 36 Poles	0	64	0	0	0	0	0	0	0	0	0	0	0	0	0	64
Transmission Shoofly Wood/Wood Equivalent Pole Assembly (6) 36 Poles	0	136	11	0	0	0	0	0	0	0	0	0	0	0	0	148
Transmission Shoofly Wood/Wood Equivalent Pole Installation (7) 36 Pol	0	0	574	0	0	0	0	0	0	0	0	0	0	0	0	574
Transmission Shoofly Conductor & GW Installation (8) 84,000 Feet	0	0	75	824	0	0	0	0	0	0	0	0	0	0	0	899
Transmission Remove Existing Conductor & GW (9) 105,000 Feet	0	0	0	206	115	0	0	0	0	0	0	0	0	0	0	321
Transmission LST Removal (10) 15 Towers	0	0	0	0	253	101	0	0	0	0	0	0	0	0	0	355
Transmission LST Foundation Removal (11) 15 Towers	0	0	0	0	0	626	0	0	0	0	0	0	0	0	0	626
Transmission Install H-Frame Hybrid Foundations (12) 14 Structures	0	0	0	0	0	124	1241	993	0	0	0	0	0	0	0	2358
Transmission H-Frame Hybrid Haul (13) 14 Structures	0	0	0	0	0	0	0	43	11	0	0	0	0	0	0	53
Transmission H-Frame Hybrid Assembly (14) 14 Structures	0	0	0	0	0	0	0	0	186	0	0	0	0	0	0	186
Transmission H-Frame Hybrid Erection (15) 14 Structures	0	0	0	0	0	0	0	0	64	115	0	0	0	0	0	178
Transmission Install Conductor & GW (16) 105,000 Feet	0	0	0	0	0	0	0	0	0	847	231	0	0	0	0	1078
Transmission Shoofly Conductor/GW Removal (17) 84,000 Feet	0	0	0	0	0	0	0	0	0	0	280	0	0	0	0	280
Transmission Shoofly Pole Removal (18) 36 Poles	0	0	0	0	0	0	0	0	0	0	101	51	0	0	0	152
Transmission Guard Structure Removal (19) 4 Structures	0	0	0	0	0	0	0	0	0	0	0	17	0	0	0	17
Transmission Restoration (20) 3 Miles	0	0	0	0	0	0	0	0	0	0	0	306	0	0	0	306
Distribution Survey (21) 15 Removed/22 Removed and Replaced	0	0	0	0	0	0	0	0	0	0	0	46	0	0	0	46
Distribution Remove Existing Conductor (22) 3 Miles	0	0	0	0	0	0	0	0	0	0	0	22	0	0	0	22
Distribution Pole Removal (23) 37 Poles	0	0	0	0	0	0	0	0	0	0	0	13	241	0	0	253
Distribution Pole Assembly and Set/Replacement (24) 22 Poles	0	0	0	0	0	0	0	0	0	0	0	0	6	58	0	65
Distribution Install or Transfer Conductor (25) 3 Miles	0	0	0	0	0	0	0	0	0	0	0	0	0	31	0	31
Distribution Restoration (26) 37 Sites	0	0	0	0	0	0	0	0	0	0	0	0	0	0	238	238
Sum	2118	612	1021	1391	729	1212	1602	1396	622	1323	974	815	608	451	328	15202
	14424	12756	12472													
Max 12-month (tons)	7.212															

Work Activity	Monthly Total PM2.5 (lbs) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Sum
Staging/Material Yard (1)	39	39	39	39	39	39	39	39	39	39	39	39	39	39	10	552
Transmission Survey (2) 5 Miles	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Transmission Road & Structure Pad Work (3) 6 Miles 33 Pads	182	0	0	0	0	0	0	0	0	0	0	0	0	0	0	182
Transmission Guard Structure Installation (4) 4 Structures	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Transmission Shoofly Pole Haul (5) 36 Poles	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	7
Transmission Shoofly Wood/Wood Equivalent Pole Assembly (6) 36 Poles	0	17	1	0	0	0	0	0	0	0	0	0	0	0	0	18
Transmission Shoofly Wood/Wood Equivalent Pole Installation (7) 36 Pol	0	0	43	0	0	0	0	0	0	0	0	0	0	0	0	43
Transmission Shoofly Conductor & GW Installation (8) 84,000 Feet	0	0	8	85	0	0	0	0	0	0	0	0	0	0	0	93
Transmission Remove Existing Conductor & GW (9) 105,000 Feet	0	0	0	26	15	0	0	0	0	0	0	0	0	0	0	41
Transmission LST Removal (10) 15 Towers	0	0	0	0	29	12	0	0	0	0	0	0	0	0	0	41
Transmission LST Foundation Removal (11) 15 Towers	0	0	0	0	0	49	0	0	0	0	0	0	0	0	0	49
Transmission Install H-Frame Hybrid Foundations (12) 14 Structures	0	0	0	0	0	12	123	99	0	0	0	0	0	0	0	234
Transmission H-Frame Hybrid Haul (13) 14 Structures	0	0	0	0	0	0	0	5	1	0	0	0	0	0	0	6
Transmission H-Frame Hybrid Assembly (14) 14 Structures	0	0	0	0	0	0	0	0	22	0	0	0	0	0	0	22
Transmission H-Frame Hybrid Erection (15) 14 Structures	0	0	0	0	0	0	0	0	8	14	0	0	0	0	0	22
Transmission Install Conductor & GW (16) 105,000 Feet	0	0	0	0	0	0	0	0	0	95	26	0	0	0	0	121
Transmission Shoofly Conductor/GW Removal (17) 84,000 Feet	0	0	0	0	0	0	0	0	0	0	35	0	0	0	0	35
Transmission Shoofly Pole Removal (18) 36 Poles	0	0	0	0	0	0	0	0	0	0	12	6	0	0	0	17
Transmission Guard Structure Removal (19) 4 Structures	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2
Transmission Restoration (20) 3 Miles	0	0	0	0	0	0	0	0	0	0	0	24	0	0	0	24
Distribution Survey (21) 15 Removed/22 Removed and Replaced	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5
Distribution Remove Existing Conductor (22) 3 Miles	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3
Distribution Pole Removal (23) 37 Poles	0	0	0	0	0	0	0	0	0	0	0	1	28	0	0	30
Distribution Pole Assembly and Set/Replacement (24) 22 Poles	0	0	0	0	0	0	0	0	0	0	0	0	1	7	0	8
Distribution Install or Transfer Conductor (25) 3 Miles	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4
Distribution Restoration (26) 37 Sites	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	18
Sum	225	67	91	150	82	112	162	142	70	148	111	80	68	49	28	1586
	1509	1333	1294													
Max 12-month (tons)	0.75															





Lake Success Transmission Project

Main Emissions Calculation Worksheet, Daily and Total Activity

Original equipment list and usage assumptions from "Table 3-8. Proposed Project Construction Equipment and Workforce Estimates by Activity"

Assumed one water truck plus an additional one for specific activities

WORK ACTIVITY				ACTIVITY ESTIMATES					Exhaust Emission Factor Type	Load Factor	EXHAUST EMISSION FACTORS Offroad (lbs/hr) or Onroad (lbs/mile)								FUGITIVE DUST EMISSION FACORS PM10 (lbs/mile or lbs/hr)			PM2.5 (lbs/mile or lbs/hr)			WORK DAY EXHAUST EMISSION RATE (lbs/day)								WORK DAY FUGITIVE DUST EMISSIONS (lbs/day)		WORK DAY EXHAUST PLUS FUGITIVE DUST (lbs/day)		TOTAL WORK ACTIVITY EXHAUST EMISSIONS (lbs)								FUGITIVE DUST EMISSIONS (lbs)		TOTAL WORK ACTIVITY PARTICULATE EMISSIONS (lbs)	
Primary Equipment Description	Estimated Horse Power	Fuel Type	Primary Equipment Quantity	Estimated Workforce	Estimated Schedule (days)	Usage (hrs/day)	Onroad Travel Paved (miles/day)	Onroad Travel Unpaved (miles/day)			ROG	CO	NOX	SOX	PM10	PM2.5	CO2	CH4	Paved Roads	Unpaved Roads	Earth Moving	Paved Roads	Unpaved Roads	Earth Moving	ROG	CO	NOX	SOX	PM10	PM2.5	CO2	CH4	PM10	PM2.5	PM10	PM2.5	ROG	CO	NOX	SOX	PM10	PM2.5	CO2	CH4	PM10	PM2.5	PM10	PM2.5
Staging/Material Yard (1)				4	285																																											
Worker Vehicle	-	Gas	2		285	8	50	1	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.05	0.43	0.04	0.00	0.01	0.01	113	0.00	0.22	0.03	0.23	0.03	14.7	122.4	11.0	0.3	2.8	1.8	32270	1.3	62.8	8.0	65.6	9.8
1-Ton Truck, 4x4	300	Gas	2		285	4	50	10	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.06	0.51	0.05	0.00	0.01	0.01	133	0.01	1.83	0.19	1.84	0.20	17.3	144.1	12.9	0.4	3.3	2.2	37965	1.5	521.1	53.8	524.4	56.0
R/T Forklift	125	Diesel	1		285	4	0	10	Offroad	1	0.021	0.209	0.132	0.000	0.006	0.005	31.2	0.002	0.000	0.126	-	0.000	0.013	-	0.08	0.84	0.53	0.00	0.02	0.02	125	0.01	1.26	0.13	1.28	0.14	23.6	238.3	150.6	0.4	6.7	5.3	35596	2.1	358.8	35.9	365.4	41.2
Ranger	50	Diesel	1		285	4	0	10	Offroad	1	0.030	0.224	0.189	0.000	0.007	0.005	28.0	0.003	0.000	0.054	-	0.000	0.005	-	0.12	0.90	0.76	0.00	0.03	0.02	112	0.01	0.54	0.05	0.56	0.07	34.6	255.7	215.8	0.4	7.6	6.1	31908	3.1	152.8	15.3	160.4	21.3
Generator	49	Diesel	1		285	8	0	0	Offroad	1	0.034	0.212	0.212	0.000	0.009	0.007	30.6	0.003	0.000	0.000	-	0.000	0.000	-	0.27	1.69	1.69	0.00	0.07	0.06	245	0.02	0.00	0.00	0.07	0.06	77.0	482.3	482.5	0.9	20.8	16.6	69820	7.0	0.0	0.0	20.8	16.6
Water Truck (all areas)	300	Diesel	1		285	8	10	50	Onroad	1	0.001	0.007	0.008	0.000	0.000	0.000	2.9	0.000	0.006	0.280	-	0.001	0.028	-	0.07	0.45	0.46	0.00	0.02	0.02	172	0.00	14.04	1.41	14.06	1.43	19.8	128.0	132.3	0.5	5.7	4.3	48980	0.8	4002.5	402.6	4008.2	407.0
Transmission Survey (2) 5 Miles				4	5																			Work Activity Subtotal	0.66	4.81	3.53	0.01	0.16	0.13	900	0.06	17.89	1.81	18.05	1.94	187.0	1370.8	1005.1	2.9	46.8	36.4	256541	15.8	5097.9	515.6	5144.6	552.0
Worker Vehicle		Gas	2		5	8	50	1	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.05	0.43	0.04	0.00	0.01	0.01	113	0.00	0.22	0.03	0.23	0.03	0.3	2.1	0.2	0.0	0.0	0.0	566	0.0	1.1	0.1	1.2	0.2
1-Ton Truck, 4x4	300	Gas	2		5	8	50	50	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.10	0.84	0.08	0.00	0.02	0.01	222	0.01	8.98	0.90	8.99	0.92	0.5	4.2	0.4	0.0	0.1	0.1	1110	0.0	44.9	4.5	45.0	4.6
Transmission Road & Structure Pad Work (3) 6 Miles 33 Pads				5	15																			Work Activity Subtotal	0.15	1.27	0.11	0.00	0.03	0.02	335	0.01	9.20	0.93	9.22	0.95	0.8	6.4	0.6	0.0	0.1	0.1	1676	0.1	46.0	4.7	46.1	4.8
Worker Vehicle	-	Gas	4		15	8	50	1	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.10	0.86	0.08	0.00	0.02	0.01	226	0.01	0.22	0.03	0.24	0.04	1.5	12.9	1.2	0.0	0.3	0.2	3397	0.1	3.3	0.4	3.6	0.6
1-Ton Truck, 4x4	300	Gas	1		15	8	50	10	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.03	0.25	0.02	0.00	0.01	0.00	67	0.00	1.83	0.19	1.83	0.19	0.5	3.8	0.3	0.0	0.1	0.1	999	0.0	27.4	2.8	27.5	2.9
Backhoe/Front Loader	125	Diesel	1		15	4	0	20	Offroad	1	0.034	0.339	0.228	0.001	0.011	0.009	51.7	0.003	0.000	0.671	-	0.000	0.035	-	0.14	1.36	0.91	0.00	0.04	0.03	207	0.01	13.42	0.69	13.46	0.73	2.0	20.4	13.7	0.0	0.6	0.5	3104	0.2	201.2	10.4	201.9	10.9
Tracked Dozer	150	Diesel	1		15	8	0	40	Offroad	1	0.085	0.728	0.502	0.001	0.027	0.021	123.9	0.008	-	-	7.046	-	-	0.986	0.68	5.82	4.01	0.01	0.21	0.17	991	0.06	56.37	7.89	56.58	8.06	10.2	87.3	60.2	0.2	3.2	2.6	14871	0.9	845.5	118.4	848.7	120.9
Motor Grader	250	Diesel	1		15	8	0	40	Offroad	1	0.095	0.365	0.595	0.002	0.021	0.016	172.1	0.009	0.000	0.671	-	0.000	0.035	-	0.76	2.92	4.76	0.02	0.16	0.13	1377	0.07	26.83	1.39	27.00	1.52	11.4	43.8	71.5	0.2	2.5	2.0	20654	1.0	402.5	20.8	405.0	22.8
Water Truck (extra)	300	Diesel	1		15	8	5	25	Onroad	1	0.001	0.007	0.008	0.000	0.000	0.000	2.9	0.000	0.006	0.280	-	0.001	0.028	-	0.03	0.22	0.23	0.00	0.01	0.01	86	0.00	7.02	0.71	7.03	0.71	0.5	3.4	3.5	0.0	0.1	0.1	1289	0.0	105.3	10.6	105.5	10.7
Drum Compactor	100	Diesel	1		15	4	0	20	Offroad	1	0.053	0.385	0.352	0.001	0.024	0.019	59.0	0.005	0.000	0.179	-	0.000	0.018	-	0.21	1.54	1.41	0.00	0.10	0.08	236	0.02	3.57	0.36	3.67	0.43	3.2	23.1	21.1	0.0	1.4	1.1	3539	0.3	53.6	5.4	55.0	6.5
Lowboy Truck/Trailer	450	Diesel	1		15	2	10	10	Onroad	1	0.001	0.007	0.008	0.000	0.000	0.000	2.9	0.000	0.006	0.420	-	0.001	0.042	-	0.02	0.15	0.15	0.00	0.01	0.01	57	0.00	4.25	0.43	4.26	0.44	0.3	2.2	2.3	0.0	0.1	0.1	859	0.0	63.8	6.5	63.9	6.6
Transmission Guard Structure Installation (4) 4 Structures				6	2																			Work Activity Subtotal	1.98	13.12	11.58	0.04	0.56	0.44	3247	0.18	113.51	11.69	114.07	12.13	29.7	196.9	173.7	0.5	8.4	6.6	48711	2.6	1702.7	175.3	1711.1	181.9
Worker Vehicle	-	Gas	4		2	8	50	1	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.10	0.86	0.08	0.00	0.02	0.01	226	0.01	0.22	0.03	0.24	0.04	0.2	1.7	0.2	0.0	0.0	0.0	453	0.0	0.4	0.1	0.5	0.1
1-Ton Truck, 4x4	300	Gas	2		2	8	50	10	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.06	0.51	0.05	0.00	0.01	0.01	133	0.01	1.83	0.19	1.84	0.20	0.1	1.0	0.1	0.0	0.0	0.0	266	0.0	3.7	0.4	3.7	0.4
Compressor Trailer	60	Diesel	1		2	4	10	10	Offroad	1	0.035	0.198	0.166	0.000	0.008	0.007	22.3	0.003	0.001	0.179	-	0.000	0.018	-	0.14	0.79	0.66	0.00	0.03	0.03	89	0.01	1.80	0.18	1.83	0.21	0.3	1.6	1.3	0.0	0.1	0.1	178	0.0	3.6	0.4	3.7	0.4
Manlift/Bucket Truck	250	Diesel	1		2	4	10	10	Offroad	1	0.024	0.168	0.173	0.000	0.008	0.006	34.7	0.002	0.006	0.420	-	0.001	0.042	-	0.10	0.67	0.69	0.00	0.03	0.03	139	0.01	4.25	0.43	4.29	0.46	0.2	1.3	1.4	0.0	0.1	0.1	278	0.0	8.5	0.9	8.6	0.9
Boom/Crane Truck	350	Diesel	1		2	8	10	10	Offroad	1	0.085	0.387	0.603	0.001	0.023	0.018	128.6	0.008	0.006	0.420	-	0.001	0.042	-	0.68	3.09	4.83	0.01	0.18	0.15	1029	0.06	4.25	0.43	4.44	0.58	1.4	6.2	9.7	0.0	0.4	0.3	2058	0.1	8.5	0.9	8.9	1.2
Auger Truck	210	Diesel	1		2	4	10	10	Offroad	1	0.046	0.343	0.136	0.002	0.004	0.003	188.1	0.004	0.006	0.420	0.488	0.001	0.042	0.068	0.18	1.37	0.55	0.01	0.02	0.01	752	0.02	8.24	0.13	8.26	0.14	0.4	2.7	1.1	0.0	0.0	0.0	1505	0.0	16.5	0.3	16.5	0.3
Flatbed Truck	400	Diesel	1		2	8	10	10	Onroad	1	0.001	0.007	0.008	0.000	0.000	0.000	2.9	0.000	0.006	0.420	-	0.001	0.042	-	0.02	0.15	0.15	0.00	0.01	0.01	57	0.00	4.25	0.43	4.26	0.44	0.0	0.3	0.3	0.0	0.0	0.0	115	0.0	8.5	0.9	8.5	0.9
Transmission Shoofly Pole Haul (5) 36 Poles				4	6																			Work Activity Subtotal	1.28	7.44	7.00	0.03	0.30	0.24	2426	0.11	24.84	1.83	25.15	2.07	2.6	14.9	14.0	0.1	0.6	0.5	4853	0.2	49.7	3.7	50.3	4.1
Worker Vehicle	-	Gas	2		6	8	50	1	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.05	0.43	0.04	0.00	0.01	0.01	113	0.00	0.22	0.03	0.23	0.03	0.3	2.6	0.2	0.0	0.1	0.0	679	0.0	1.3	0.2	1.4	0.2
1-Ton Truck, 4x4	300	Gas	2		6	8	50	10	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.06	0.51	0.05	0.00	0.01	0.01	133	0.01	1.83	0.19	1.84	0.20	0.4	3.0	0.3	0.0	0.1	0.0	799	0.0	11.0	1.1	11.0	1.2
Boom/Crane Truck	350	Diesel	1		6	4	10	10	Offroad	1	0.085	0.387	0.603	0.001	0.023	0.018	128.6	0.008	0.006	0.420	-	0.001	0.042	-	0.34	1.55	2.41	0.01	0.09	0.07	515	0.03	4.25	0.43	4.34	0.51	2.0	9.3	14.5	0.0	0.5	0.4	3087	0.2	25.5	2.6	26.1	3.0
Flatbed Truck	400	Diesel	1		6	8	10	10	Onroad	1	0.001	0.007	0.008	0.000	0.000	0.000	2.9	0.000	0.006	0.420	-	0.001	0.042	-	0.02	0.15	0.15	0.00	0.01	0.01	57	0.00	4.25	0.43	4.26	0.44	0.1	0.9	0.9	0.0	0.0	0.0	344	0.0	25.5	2.6	25.6	2.6
Transmission Shoofly Wood/Wood Equivalent Pole Assembly (6) 36				6	13																			Work Activity Subtotal	0.47	2.63	2.65	0.01	0.12	0.09	818	0.04	10.56	1.08	10.67	1.18	2.8	15.78	15.91	0.05	0.72	0.55	4909.53	0.25	63.33	6.51	64.05	7.06
Worker Vehicle	-	Gas	4		13	8	50	1	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.10	0.86	0.08	0.00	0.02	0.01	226	0.01	0.22	0.03	0.24	0.04	1.3	11.2	1.0	0.0	0.3	0.2	2944	0.1	2.9	0.4	3.1	0.5
1-Ton Truck, 4x4	300	Gas	2		13	4	50	10	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.06	0.51	0.05	0.00	0.01	0.01	133	0.01	1.83	0.19	1.84	0.20	0.8	6.6	0.6	0.0	0.2	0.1	1732	0.1	23.8	2.5	23.9	2.6
Compressor Trailer	60	Diesel	1		13	8	10	10	Offroad	1	0.035	0.198	0.166	0.000	0.008	0.007	22.3	0.003	0.001	0.179	-	0.000	0.018	-	0.28	1.58	1.33	0.00	0.07	0.05	178	0.03	1.80	0.18	1.86	0.23	3.7	20.6	17.3	0.0	0.9	0.7	2316	0.3	23.3	2.3	24.2	3.1
Manlift/Bucket Truck	250	Diesel	1		9	8	10	10	Offroad	1	0.024	0.168	0.173	0.000	0.008	0.006	34.7	0.002	0.006	0.420	-	0.001	0.042	-	0.19	1.34	1.38	0.00	0.06	0.05	278	0.02	4.25	0.43	4.32	0.48	1.7	12.1	12.4	0.0	0.6	0.5	2500	0.2	38.3	3.9	38.9	4.4
R/T Crane (L)	275	Diesel	1		13	8	10	10	Offroad	1	0.085	0.387	0.603	0.001	0.023	0.018	128.6	0.008	0.006	0.420	-	0.001	0.042	-	0.68	3.09	4.83	0.01	0.18	0.15	1029	0.06	4.25	0.43	4.44	0.58	8.8	40.2	62.7	0.1	2.4	1.9	13378	0.8	55.3	5.6	57.7	7.5
Transmission Shoofly Wood/Wood Equivalent Pole Installation (7)				6	18																			Work Activity Subtotal	1.31	7.38	7.66	0.02	0.35	0.27	1845	0.12	12.35	1.27	12.70	1.54	16.3	90.59	94.02	0.25	4.24	3.33	22869.58	1.46	143.54	14.71	147.78	18.04
Worker Vehicle	-	Gas	4		18	8	50	1	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.10	0.86	0.08	0.00	0.02	0.01	226	0.01	0.22	0.03	0.24	0.04	1.9	15.5	1.4	0.0	0.4	0.2	4076	0.2	4.0	0.5	4.3	0.7
1-Ton Truck, 4x4	300	Gas	2		18	4	50	10	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.06	0.51	0.05	0.00	0.01	0.01	133	0.01	1.83	0.19	1.84	0.20	1.1	9.1	0.8	0.0	0.2	0.1	2398	0.1	32.9	3.4	33.1	3.5
Compressor Trailer	60	Diesel	1		18	4	50	10	Offroad	1	0.035	0.198	0.166	0.000	0.008	0.007	22.3	0.003	0.001	0.179	-	0.000	0.018	-	0.14	0.79	0.66	0.00	0.03	0.03	89	0.01	1.83	0.19	1.86	0.22	2.6	14.2	11.9	0.0	0.6	0.5	1604	0.2	32.9	3.4	33.5	3.9
Manlift/Bucket Truck	250	Diesel	1		18	8	10	10	Offroad	1	0.024	0.168	0.173	0.000	0.008	0.006	34.7	0.002	0.006	0.420	-	0.001	0.042	-	0.19	1.34	1.38	0.00	0.06	0.05	278	0.02	4.25	0.43	4.32	0.48	3.4	24.1	24.9	0.1	1.1	0.9	5000	0.3	76.6	7.8	77.7	8.7
Boom/Crane Truck	350	Diesel	1		18	4	10	10	Offroad	1	0.085	0.387	0.603	0.001	0.023	0.018	128.6	0.008	0.006	0.420	-	0.001	0.042	-	0.34	1.55	2.41	0.01	0.09	0.07	515	0.03	4.25	0.43	4.34	0.51	6.1	27.8	43.4	0.1	1.6	1.3	9261	0.5	76.6	7.8	78.2	9.1
Auger Truck	210	Diesel	1		18	4	10	10	Offroad	1	0.046	0.343	0.136	0.002	0.004	0.003	188.1	0.004	0.006	0.420	0.488	0.001	0.042	0.068	0.18	1.37	0.55	0.01	0.02	0.01	752	0.02	8.24	0.13	8.26	0.14	3.3	24.7	9.8	0.2	0.3	0.2	13543	0.3	148.3	2.3	148.6	2.6
Backhoe/Front Loader	125	Diesel	1		18	4	0	10	Offroad	1	0.034	0.339	0.228	0.001	0.011	0.009	51.7	0.003	0.000	0.671	-	0.000	0.035	-	0.14	1.36	0.91	0.00	0.04	0.03	207	0.01	6.71	0.35	6.75	0.38	2.4	24.4	16.4	0.0	0.8	0.6	3724	0.2	120.7	6.2	121.5	6.9
Flatbed Truck	400	Diesel	1		18	4	10	10	Onroad	1	0.001	0.007	0.008	0.000	0.000	0.000	2.9	0.000	0.006	0.420	-	0.001	0.042	-	0.02	0.15	0.15	0.00	0.01	0.01	57	0.00	4.25	0.43	4.26	0.44	0.4	2.7	2.8	0.0	0.1	0.1	1031	0.0	76.6	7.8	76.7	7.9
Transmission Shoofly Conductor & GW Installation (8) 84,000 Feet				14	12																			Work Activity Subtotal	1.18	7.92	6.19	0.02	0.29	0.22	2258	0.10	31.58	2.18	31.87	2.41	21.2	142.59	111.43	0.45	5.16	4.04	40637.92	1.88	568.53	39.28	573.68	43.32
Worker Vehicle	-	Gas	10		12	8	50	1	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.26	2.15	0.19	0.01	0.05	0.03	566	0.02	0.22	0.03	0.27	0.06	3.1	25.8	2.3	0.1	0.6	0.4	6794	0.3	2.6	0.3	3.2	0.7
1-Ton Truck, 4x4	300	Gas	4		12	8	50	10	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.12	1.01	0.09	0.00	0.02	0.02	266	0.01	1.83	0.19	1.85	0.20	1.5	12.1	1.1	0.0	0.3	0.2	3197	0.1	21.9	2.3	22.2	2.4
Manlift/Bucket Truck	250	Diesel	2		12	8	10	10	Offroad	1	0.024	0.168	0.173	0.000	0.008	0.006	34.7	0.002	0.006	0.420	-	0.001	0.042	-	0.38	2.68	2.76	0.01	0.13	0.10	556	0.03	4.25	0.43	4.38	0.54	4.6	32.2	33.1	0.1	1.5	1.2	6667	0.4	51.0	5.2	52.6	6.4
Boom/Crane Truck	350	Diesel	2		12	8	10	10	Offroad	1	0.085	0.387	0.603	0.001	0.023	0.018	128.6	0.008	0.006	0.420	-	0.001	0.042	-	1.35	6.18	9.65	0.02	0.37	0.29	2058	0.12	4.25	0.43	4.62	0.73	16.2	74.2	115.8	0.3	4.4	3.5	24697	1.5	51.0	5.2	55.4	8.7
R/T Crane (M)	215	Diesel	1		12	4	10	10	Offroad	1	0.085	0.387	0.603	0.001	0.023	0.018	128.6	0.008	0.006	0.420	-	0.001	0.042	-	0.34	1.55	2.41	0.01	0.09	0.07	515	0.03	4.25	0.43	4.34	0.51	4.1	18.6	29.0	0.1	1.1	0.9	6174	0.4	51.0	5.2	52.1	6.1
Dump/Stake Bed Truck	350	Diesel	1		12	4	10	10	Onroad	1	0.001	0.007	0.008	0.000	0.000	0.000	2.9	0.000	0.006	0.420	-	0.001	0.042	-	0.02	0.15	0.15	0.00	0.01	0.01	57	0.00	4.25	0.43	4.26	0.44	0.3	1.8	1.9	0.0	0.1	0.1	687	0.0	51.0	5.2	51.1	5.3
Wire Truck/Trailer	350	Diesel	1		8	8	10	10	Onroad	1	0.001	0.007	0.008	0.000	0.000	0.000	2.9	0.000	0.006	0.420	-	0.001	0.042	-	0.02	0.15	0.15	0.00	0.01	0.01	57	0.00	4.25	0.43	4.26	0.44	0.2	1.2	1.2	0.0	0.1	0.0	458	0.0	34.0	3.5	34.1	3.5
Sock Line Puller	300	Diesel	1		4	8	10	10	Offroad	1	0.053	0.350	0.312	0.001	0.012	0.010	122.5	0.005	0.006	0.420	-	0.001	0.042	-	0.43	2.80	2.50	0.01	0.10	0.08	980	0.04	4.25	0.43	4.35	0.51	1.7	11.2	10.0	0.0	0.4	0.3	3920	0.2	17.0	1.7	17.4	2.0
Bullwheel Puller	350	Diesel	1		8	8	10	10	Offroad	1	0.024	0.168	0.173	0.000	0.008	0.006	34.7	0.002	0.006	0.420	-	0.001	0.042	-	0.19	1.34	1.38	0.00	0.06	0.05	278	0.02	4.25	0.43	4.32	0.48	1.5	10.7	11.0	0.0	0.5	0.4	2222	0.1	34.0	3.5	34.5	3.9
Static Truck/ Tensioner	350	Diesel	1		12	8	10	10	Offroad	1	0.137	0.548	0.738	0.003	0.025	0.020	260.1	0.012	0.006	0.420	-	0.001	0.042	-	1.10	4.38	5.91	0.02	0.20	0.16	2081	0.10	4.25	0.43	4.45	0.59	13.1	52.6	70.9	0.3	2.4	1.9	24968	1.2	51.0	5.2	53.4	7.1
R/T Forklift	125	Diesel	1		8	8	0	40	Offroad	1	0.021	0.209	0.132	0.000	0.006	0.005	31.2	0.002	0.006	0.420	-	0.001	0.042	-	0.17	1.67	1.06	0.00	0.05	0.04	250	0.01	16.78	1.68	16.83	1.72	1.3	13.4	8.5	0.0	0.4	0.3	1998	0.1	134.3	13.4	134.6	13.7
Backhoe/Front Loader	125	Diesel	1		12	4	0	20	Offroad	1	0.034	0.339	0.228	0.001	0.011	0.009	51.7	0.003	0.000	0.671	-	0.000	0.035	-	0.14	1.36	0.91	0.00	0.04	0.03	207	0.01	13.42	0.69	13.46	0.73	1.6	16.3	10.9	0.0	0.5	0.4	2483	0.1	161.0	8.3	161.5	8.7
Sag Cat w/ Winches	350	Diesel	2		6	2	0	10	Offroad	1	0.078	0.326	0.389	0.002	0.013	0.011	158.7	0.007	0.006	0.420	-	0.001	0.042	-	0.31	1.30	1.56	0.01	0.05	0.04	635	0.03	4.20	0.42	4.25	0.46	1.9	7.8	9.3	0.0	0.3	0.3	3808	0.2	25.2	2.5	25.5	2.8
Water Truck (extra)	300	Diesel	1		12	8	10	40	Onroad	1	0.001	0.007	0.008	0.000	0.000	0.000	2.9	0.000	0.006	0.280	-	0.001	0.028	-	0.06	0.37	0.39	0.00	0.02	0.01	143	0.00	11.25	1.13	11.26	1.15	0.7	4.5	4.6	0.0	0.2	0.2	1719	0.0	135.0	13.6	135.2	13.7
Lowboy Truck/Trailer	450	Diesel	2		12	2	10	10	Onroad	1	0.001	0.007	0.008	0.000	0.000	0.000	2.9	0.000	0.006	0.420	-	0.001	0.042	-	0.05	0.30	0.31	0.00	0.01	0.01	115	0.00	4.25	0.43	4.27	0.44	0.6	3.6	3.7	0.0	0.2	0.1	1375	0.0	51.0	5.2	51.2	5.3
Hughes 500E	450	Jet A	1		3	8	-	-	DETEC	1	1.704	2.118	1.537	1.548	0.047	0.047	815.6	0.224	0.000	0.000	0.000	0.000	0.000	0.000	13.63	16.94	12.29	12.39	0.38	0.38	6525	1.80	0.00	0.00	0.38	0.38	40.9	50.8	36.9	37.2	1.1	1.1	19575	5.4	0.0	0.0	1.1	1.1
Helicopter Fuel Truck	350	Diesel	1		3	8	50	10	Onroad	1	0.001	0.007	0.008	0.000	0.000	0.000	2.9	0.000	0.006	0.420	-	0.001	0.042	-	0.07	0.45	0.46	0.00	0.02	0.02	172	0.00	4.48	0.49	4.50	0.51	0.2	1.3	1.4	0.0	0.1	0.0	516	0.0	13.4	1.5	13.5	1.5
Transmission Remove Existing Conductor & GW (9) 105,000 Feet				14	14																			Work Activity Subtotal	18.63	44.79	42.18	12.48	1.60	1.34	15460	2.23	90.46	8.53	92.06	9.88	93.5	338.10	351.68	38.12	14.05	11.33	111258.78	10.02	884.75	81.83	898.80	93.16
Worker Vehicle	-	Gas	10		14	8	50	1	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.26	2.15	0.19	0.01	0.05	0.03	566	0.02	0.22	0.03	0.27	0.06	3.6	30.1	2.7	0.1	0.7	0.5	7926	0.3	3.1	0.4	3.8	0.8
1-Ton Truck, 4x4	300	Gas	4		14	8	50	10	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.12	1.01	0.09	0.00	0.02	0.02	266	0.01	1.83	0.19	1.85	0.20	1.7	14.2	1.3	0.0	0.3	0.2	3730	0.1	25.6	2.6	25.9	2.9
Manlift/Bucket Truck	250	Diesel	2		14	8	10	10	Offroad	1	0.024	0.168	0.173	0.000	0.008	0.006	34.7	0.002	0.006	0.420	-	0.001	0.042	-	0.38	2.68	2.76	0.01	0.13	0.10	556	0.03	4.25	0.43	4.38	0.54	5.3	37.6	38.7	0.1	1.8	1.4	7778	0.5	59.5	6.1	61.3	7.5
Boom/Crane Truck	350	Diesel	2		14	8	10	10	Offroad	1	0.085	0.387	0.603	0.001	0.023	0.018	128.6	0.008	0.006	0.420	-	0.001	0.042	-	1.35	6.18	9.65	0.02	0.37	0.29	2058	0.12	4.25	0.43	4.62	0.73	18.9	86.6	135.1	0.3	5.1	4.1	28813	1.7	59.5	6.1	64.7	10.2
Puller	350	Diesel	1		10	8	10	10	Offroad	1	0.053	0.350	0.312	0.001	0.012	0.010	122.5	0.005	0.006	0.420	-	0.001	0.042	-	0.43	2.80	2.50	0.01	0.10	0.08	980	0.04	4.25	0.43	4.35	0.51	4.3	28.0	25.0	0.1	1.0	0.8	9800	0.4	42.5	4.3	43.5	5.1
Static Truck/ Tensioner	350	Diesel	1		14	8	10	10	Offroad	1	0.137	0.548	0.738	0.003	0.025	0.020	260.1	0.012	0.006	0.420	-	0.001	0.042	-	1.10	4.38	5.91	0.02	0.20	0.16	2081	0.10	4.25	0.43	4.45	0.59	15.3	61.3	82.7	0.3	2.8	2.2	29129	1.4	59.5	6.1	62.3	8.3
Dump/Stake Bed Truck	350	Diesel	1		14	8	10	10	Onroad	1	0.001	0.007	0.008	0.000	0.000	0.000	2.9	0.000	0.006	0.420	-	0.001	0.042	-	0.02	0.15	0.15	0.00	0.01	0.01	57	0.00	4.25	0.43	4.26	0.44	0.3	2.1	2.2	0.0	0.1	0.1	802	0.0	59.5	6.1	59.6	6.1
Transmission LST Removal (10) 15 Towers				6	21																			Work Activity Subtotal	3.66	19.35	21.25	0.07	0.87	0.68	6564	0.33	23.32	2.39	24.18	3.07	49.5	259.77	287.58	0.92	11.74	9.25	87978.31	4.43	309.40	31.66	321.15	40.91
Worker Vehicle	-	Gas	4		21	8	50	1	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.10	0.86	0.08	0.00	0.02	0.01	226	0.01	0.22	0.03	0.24	0.04	2.2	18.0	1.6	0.0	0.4	0.3	4756	0.2	4.6	0.6	5.0	0.9
1-Ton Truck, 4x4	300	Gas	2		21	4	50	10	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.06	0.51	0.05	0.00	0.01	0.01	133	0.01	1.83	0.19	1.84	0.20	1.3	10.6	1.0	0.0	0.2	0.2	2797	0.1	38.4	4.0	38.6	4.1
Compressor Trailer	60	Diesel	1		21	8	10	10	Offroad	1	0.035	0.198	0.166	0.000	0.008	0.007	22.3	0.003	0.001	0.179	-	0.000	0.018	-	0.28	1.58	1.33	0.00	0.07	0.05	178	0.03	1.80	0.18	1.86	0.23	6.0	33.2	27.9	0.0	1.4	1.1	3742	0.5	37.7	3.8	39.1	4.9
R/T Crane (M)	215	Diesel	1		21	8	10	10	Offroad	1	0.085	0.387	0.603	0.001	0.023	0.018	128.6	0.008	0.006	0.420	-	0.001	0.042	-	0.68	3.09	4.83	0.01	0.18	0.15	1029	0.06	4.25	0.43	4.44	0.58	14.2	64.9	101.4	0.2	3.8	3.1	21610	1.3	89.3	9.1	93.2	12.2
Dump/Stake Bed Truck	350	Diesel	1		21	8	10	10	Onroad	1	0.001	0.007	0.008	0.000	0.000	0.000	2.9	0.000	0.006	0.420	-	0.001	0.042	-	0.02	0.15	0.15	0.00	0.01	0.01	57	0.00	4.25	0.43	4.26	0.44	0.5	3.1	3.2	0.0	0.1	0.1	1203	0.0	89.3	9.1	89.5	9.2
Flatbed Truck	400	Diesel	1		21	2	10	10	Onroad	1	0.001	0.007	0.008	0.000	0.000	0.000	2.9	0.000	0.006	0.420	-	0.001	0.042	-	0.02	0.15	0.15	0.00	0.01	0.01	57	0.00	4.25	0.43	4.26	0.44	0.5	3.1	3.2	0.0	0.1	0.1	1203	0.0	89.3	9.1	89.5	9.2
Transmission LST Foundation Removal (11) 15 Towers				4	12																			Work Activity Subtotal	1.17	6.34	6.59	0.02	0.30	0.23	1681	0.10	16.60	1.70	16.90	1.93	24.6	133.12	138.30	0.38	6.20	4.86	35310.82	2.16	348.68	35.67	354.88	40.53
Worker Vehicle	-	Gas	4		12	8	50	1	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.10	0.86	0.08	0.00	0.02	0.01	226	0.01	0.22	0.03	0.24	0.04	1.2	10.3	0.9	0.0	0.2	0.2	2718	0.1	2.6	0.3	2.9	0.5
1-Ton Truck, 4x4	300	Gas	2		12	4	50	10	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.06	0.51	0.05	0.00	0.01	0.01	133	0.01	1.83	0.19	1.84	0.20	0.7	6.1	0.5	0.0	0.1	0.1	1599	0.1	21.9	2.3	22.1	2.4
Compressor Trailer	60	Diesel	1		12	8	10	10	Offroad	1	0.035	0.198	0.166	0.000	0.008	0.007	22.3	0.003	0.001	0.179	-	0.000	0.018	-	0.28	1.58	1.33	0.00	0.07	0.05	178	0.03	1.80	0.18	1.86	0.23	3.4	19.0	15.9	0.0	0.8	0.7	2138	0.3	21.5	2.2	22.4	2.8
Backhoe/Front Loader	125	Diesel	1		12	8	0	40	Offroad	1	0.034	0.339	0.228	0.001	0.011	0.009	51.7	0.003	0.000	0.671	-	0.000	0.035	-	0.27	2.72	1.82	0.00	0.09	0.07	414	0.02	26.83	1.39	26.92	1.46	3.3	32.6	21.8	0.1	1.0	0.8	4966	0.3	322.0	16.6	323.0	17.5
Dump Truck	350	Diesel	1		12	8	50	50	Onroad	1	0.001	0.007	0.008	0.000	0.000	0.000	2.9	0.000	0.006	0.420	-	0.001	0.042	-	0.12	0.75	0.77	0.00	0.03	0.03	286	0.00	21.27	2.17	21.30	2.19	1.4	9.0	9.3	0.0	0.4	0.3	3437	0.1	255.2	26.0	255.6	26.3
Transmission Install H-Frame Hybrid Foundations (12) 14 Structure				6	38																			Work Activity Subtotal	0.84	6.41	4.04	0.01	0.22	0.17	1238	0.07	51.94	3.95	52.16	4.12	10.0	76.93	48.52	0.16	2.62	2.03	14857.19	0.83	623.32	47.43	625.94	49.46
Worker Vehicle	-	Gas	4		38	8	50	1	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.10	0.86	0.08	0.00	0.02	0.01	226	0.01	0.22	0.03	0.24	0.04	3.9	32.7	2.9	0.1	0.7	0.5	8605	0.3	8.4	1.1	9.1	1.6
1-Ton Truck, 4x4	300	Gas	2		38	4	50	10	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.06	0.51	0.05	0.00	0.01	0.01	133	0.01	1.83	0.19	1.84	0.20	2.3	19.2	1.7	0.0	0.4	0.3	5062	0.2	69.5	7.2	69.9	7.5
Boom/Crane Truck	350	Diesel	1		38	4	10	10	Offroad	1	0.085	0.387	0.603	0.001	0.023	0.018	128.6	0.008	0.006	0.420	-	0.001	0.042	-	0.34	1.55	2.41	0.01	0.09	0.07	515	0.03	4.25	0.43	4.34	0.51	12.9	58.8	91.7	0.2	3.5	2.8	19552	1.2	161.6	16.5	165.1	19.3
Backhoe/Front Loader	125	Diesel	1		38	4	0	10	Offroad	1	0.034	0.339	0.228	0.001	0.011	0.009	51.7	0.003	0.000	0.671	-	0.000	0.035	-	0.14	1.36	0.91	0.00	0.04	0.03	207	0.01	6.71	0.35	6.75	0.38	5.2	51.6	34.6	0.1	1.6	1.3	7863	0.5	254.9	13.2	256.5	14.5
Drill Rig	275	Diesel	1		20	8	10	10	Offroad	1	0.046	0.343	0.136	0.002	0.004	0.003	188.1	0.004	0.006	0.420	-	0.001	0.042	-	0.36	2.74	1.09	0.02	0.03	0.03	1505	0.03	4.25	0.43	4.29	0.46	7.3	54.8	21.8	0.3	0.7	0.5	30096	0.7	85.1	8.7	85.7	9.2

Water Truck	300	Diesel	1		38	8	10	50	Onroad	1	0.001	0.007	0.008	0.000	0.000	0.000	2.9	0.000	0.006	0.280	-	0.001	0.028	-	0.07	0.45	0.46	0.00	0.02	0.02	172	0.00	14.04	1.41	14.06	1.43	2.6	17.1	17.6	0.1	0.8	0.6	6531	0.1	533.7	53.7	534.4	54.3
Dump Truck	350	Diesel	1		38	8	50	50	Onroad	1	0.001	0.007	0.008	0.000	0.000	0.000	2.9	0.000	0.006	0.420	-	0.001	0.042	-	0.12	0.75	0.77	0.00	0.03	0.03	286	0.00	21.27	2.17	21.30	2.19	4.4	28.4	29.4	0.1	1.3	1.0	10884	0.2	808.1	82.4	809.4	83.4
Concrete Truck	350	Diesel	3		20	3	50	50	Onroad	1	0.001	0.007	0.008	0.000	0.000	0.000	2.9	0.000	0.006	0.420	-	0.001	0.042	-	0.35	2.24	2.32	0.01	0.10	0.08	859	0.01	21.27	2.17	21.37	2.24	6.9	44.9	46.4	0.2	2.0	1.5	17186	0.3	425.3	43.4	427.3	44.9
Transmission H-Frame Hybrid Haul (13) 14 Structures				4	5																			**Work Activity Subtotal**	1.53	10.45	8.09	0.04	0.35	0.27	3904	0.11	73.84	7.18	74.19	7.45	45.5	307.41	246.20	1.11	10.95	8.46	105779.71	3.41	2346.61	226.03	2357.57	234.48
Worker Vehicle	-	Gas	3		5	8	50	1	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.08	0.64	0.06	0.00	0.01	0.01	170	0.01	0.22	0.03	0.23	0.04	0.4	3.2	0.3	0.0	0.1	0.0	849	0.0	1.1	0.1	1.2	0.2
1-Ton Truck, 4x4	300	Gas	1		5	8	50	10	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.03	0.25	0.02	0.00	0.01	0.00	67	0.00	1.83	0.19	1.83	0.19	0.2	1.3	0.1	0.0	0.0	0.0	333	0.0	9.1	0.9	9.2	1.0
Boom/Crane Truck	350	Diesel	1		5	4	10	10	Offroad	1	0.085	0.387	0.603	0.001	0.023	0.018	128.6	0.008	0.006	0.420	-	0.001	0.042	-	0.34	1.55	2.41	0.01	0.09	0.07	515	0.03	4.25	0.43	4.34	0.51	1.7	7.7	12.1	0.0	0.5	0.4	2573	0.2	21.3	2.2	21.7	2.5
Flatbed Truck	400	Diesel	1		5	8	10	10	Onroad	1	0.001	0.007	0.008	0.000	0.000	0.000	2.9	0.000	0.006	0.420	-	0.001	0.042	-	0.02	0.15	0.15	0.00	0.01	0.01	57	0.00	4.25	0.43	4.26	0.44	0.1	0.7	0.8	0.0	0.0	0.0	286	0.0	21.3	2.2	21.3	2.2
Transmission H-Frame Hybrid Assembly (14) 14 Structures				6	14																			**Work Activity Subtotal**	0.47	2.59	2.65	0.01	0.12	0.09	808	0.04	10.56	1.08	10.67	1.18	2.3	12.96	13.24	0.04	0.59	0.46	4041.32	0.20	52.78	5.42	53.37	5.88
Worker Vehicle	-	Gas	4		14	8	50	1	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.10	0.86	0.08	0.00	0.02	0.01	226	0.01	0.22	0.03	0.24	0.04	1.4	12.0	1.1	0.0	0.3	0.2	3170	0.1	3.1	0.4	3.4	0.6
1-Ton Truck, 4x4	300	Gas	2		14	4	50	10	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.06	0.51	0.05	0.00	0.01	0.01	133	0.01	1.83	0.19	1.84	0.20	0.8	7.1	0.6	0.0	0.2	0.1	1865	0.1	25.6	2.6	25.8	2.8
Compressor Trailer	60	Diesel	1		14	8	10	10	Offroad	1	0.035	0.198	0.166	0.000	0.008	0.007	22.3	0.003	0.006	0.420	-	0.001	0.042	-	0.28	1.58	1.33	0.00	0.07	0.05	178	0.03	4.25	0.43	4.32	0.49	4.0	22.2	18.6	0.0	0.9	0.8	2494	0.4	59.5	6.1	60.5	6.8
Manlift/Bucket Truck	250	Diesel	1		8	8	10	10	Offroad	1	0.024	0.168	0.173	0.000	0.008	0.006	34.7	0.002	0.006	0.420	-	0.001	0.042	-	0.19	1.34	1.38	0.00	0.06	0.05	278	0.02	4.25	0.43	4.32	0.48	1.5	10.7	11.0	0.0	0.5	0.4	2222	0.1	34.0	3.5	34.5	3.9
R/T Crane (M)	215	Diesel	1		14	8	10	10	Offroad	1	0.085	0.387	0.603	0.001	0.023	0.018	128.6	0.008	0.006	0.420	-	0.001	0.042	-	0.68	3.09	4.83	0.01	0.18	0.15	1029	0.06	4.25	0.43	4.44	0.58	9.5	43.3	67.6	0.2	2.6	2.0	14407	0.9	59.5	6.1	62.1	8.1
Transmission H-Frame Hybrid Erection (15) 14 Structures				8	14																			**Work Activity Subtotal**	1.31	7.38	7.66	0.02	0.35	0.27	1845	0.12	14.81	1.52	15.15	1.79	17.3	95.29	98.92	0.26	4.46	3.50	24158.70	1.55	181.80	18.65	186.26	22.15
Worker Vehicle	-	Gas	6		14	8	50	1	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.15	1.29	0.12	0.00	0.03	0.02	340	0.01	0.22	0.03	0.25	0.05	2.2	18.0	1.6	0.0	0.4	0.3	4756	0.2	3.1	0.4	3.5	0.7
1-Ton Truck, 4x4	300	Gas	2		14	4	50	10	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.06	0.51	0.05	0.00	0.01	0.01	133	0.01	1.83	0.19	1.84	0.20	0.8	7.1	0.6	0.0	0.2	0.1	1865	0.1	25.6	2.6	25.8	2.8
Compressor Trailer	60	Diesel	1		14	4	10	10	Offroad	1	0.035	0.198	0.166	0.000	0.008	0.007	22.3	0.003	0.001	0.179	-	0.000	0.018	-	0.14	0.79	0.66	0.00	0.03	0.03	89	0.01	1.80	0.18	1.83	0.21	2.0	11.1	9.3	0.0	0.5	0.4	1247	0.2	25.1	2.5	25.6	2.9
Manlift/Bucket Truck	250	Diesel	2		14	8	10	10	Offroad	1	0.024	0.168	0.173	0.000	0.008	0.006	34.7	0.002	0.006	0.420	-	0.001	0.042	-	0.38	2.68	2.76	0.01	0.13	0.10	556	0.03	4.25	0.43	4.38	0.54	5.3	37.6	38.7	0.1	1.8	1.4	7778	0.5	59.5	6.1	61.3	7.5
Crane	400	Diesel	1		14	8	10	10	Offroad	1	0.085	0.387	0.603	0.001	0.023	0.018	128.6	0.008	0.006	0.420	-	0.001	0.042	-	0.68	3.09	4.83	0.01	0.18	0.15	1029	0.06	4.25	0.43	4.44	0.58	9.5	43.3	67.6	0.2	2.6	2.0	14407	0.9	59.5	6.1	62.1	8.1
Transmission Install Conductor & GW (16) 105,000 Feet				28	14																			**Work Activity Subtotal**	1.42	8.36	8.41	0.02	0.39	0.30	2147	0.13	12.35	1.27	12.74	1.57	19.8	117.06	117.78	0.32	5.40	4.24	30052.20	1.77	172.91	17.71	178.30	21.95
Worker Vehicle	-	Gas	20		14	8	50	1	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.52	4.30	0.39	0.01	0.10	0.06	1132	0.04	0.22	0.03	0.32	0.09	7.2	60.1	5.4	0.2	1.4	0.9	15852	0.6	3.1	0.4	4.5	1.3
1-Ton Truck, 4x4	275	Gas	8		14	4	50	10	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.24	2.02	0.18	0.01	0.05	0.03	533	0.02	1.83	0.19	1.87	0.22	3.4	28.3	2.5	0.1	0.6	0.4	7460	0.3	25.6	2.6	26.2	3.1
Manlift/Bucket Truck	250	Diesel	4		14	8	10	10	Offroad	1	0.024	0.168	0.173	0.000	0.008	0.006	34.7	0.002	0.006	0.420	-	0.001	0.042	-	0.76	5.37	5.52	0.01	0.26	0.20	1111	0.07	4.25	0.43	4.51	0.64	10.7	75.1	77.3	0.2	3.6	2.9	15555	1.0	59.5	6.1	63.1	8.9
Boom/Crane Truck	350	Diesel	3		14	8	10	10	Offroad	1	0.085	0.387	0.603	0.001	0.023	0.018	128.6	0.008	0.006	0.420	-	0.001	0.042	-	2.03	9.28	14.48	0.03	0.55	0.44	3087	0.18	4.25	0.43	4.80	0.87	28.4	129.9	202.7	0.5	7.7	6.1	43220	2.6	59.5	6.1	67.2	12.2
R/T Crane (M)	215	Diesel	2		14	4	10	10	Offroad	1	0.085	0.387	0.603	0.001	0.023	0.018	128.6	0.008	0.006	0.420	-	0.001	0.042	-	0.68	3.09	4.83	0.01	0.18	0.15	1029	0.06	4.25	0.43	4.44	0.58	9.5	43.3	67.6	0.2	2.6	2.0	14407	0.9	59.5	6.1	62.1	8.1
Dump Truck	350	Diesel	1		14	2	50	20	Onroad	1	0.001	0.007	0.008	0.000	0.000	0.000	2.9	0.000	0.006	0.420	-	0.001	0.042	-	0.08	0.52	0.54	0.00	0.02	0.02	201	0.00	8.68	0.91	8.70	0.93	1.1	7.3	7.6	0.0	0.3	0.2	2807	0.0	121.5	12.7	121.8	13.0
Wire Truck/Trailer	350	Diesel	2		10	4	10	10	Onroad	1	0.001	0.007	0.008	0.000	0.000	0.000	2.9	0.000	0.006	0.420	-	0.001	0.042	-	0.05	0.30	0.31	0.00	0.01	0.01	115	0.00	4.25	0.43	4.27	0.44	0.5	3.0	3.1	0.0	0.1	0.1	1146	0.0	42.5	4.3	42.7	4.4
Sock Line Puller	300	Diesel	1		6	8	10	10	Offroad	1	0.053	0.350	0.312	0.001	0.012	0.010	122.5	0.005	0.006	0.420	-	0.001	0.042	-	0.43	2.80	2.50	0.01	0.10	0.08	980	0.04	4.25	0.43	4.35	0.51	2.6	16.8	15.0	0.1	0.6	0.5	5880	0.2	25.5	2.6	26.1	3.1
Bull Wheel Puller	350	Diesel	1		10	8	10	10	Offroad	1	0.024	0.168	0.173	0.000	0.008	0.006	34.7	0.002	0.006	0.420	-	0.001	0.042	-	0.19	1.34	1.38	0.00	0.06	0.05	278	0.02	4.25	0.43	4.32	0.48	1.9	13.4	13.8	0.0	0.6	0.5	2778	0.2	42.5	4.3	43.2	4.8
Static Truck/ Tensioner	350	Diesel	1		14	8	10	10	Offroad	1	0.137	0.548	0.738	0.003	0.025	0.020	260.1	0.012	0.006	0.420	-	0.001	0.042	-	1.10	4.38	5.91	0.02	0.20	0.16	2081	0.10	4.25	0.43	4.45	0.59	15.3	61.3	82.7	0.3	2.8	2.2	29129	1.4	59.5	6.1	62.3	8.3
Splicing Rig	300	Diesel	1		7	8	10	10	Offroad	1	0.053	0.350	0.312	0.001	0.012	0.010	122.5	0.005	0.006	0.420	-	0.001	0.042	-	0.43	2.80	2.50	0.01	0.10	0.08	980	0.04	4.25	0.43	4.35	0.51	3.0	19.6	17.5	0.1	0.7	0.5	6860	0.3	29.8	3.0	30.5	3.6
R/T Forklift	125	Diesel	1		10	8	0	40	Offroad	1	0.021	0.209	0.132	0.000	0.006	0.005	31.2	0.002	0.006	0.420	-	0.001	0.042	-	0.17	1.67	1.06	0.00	0.05	0.04	250	0.01	16.78	1.68	16.83	1.72	1.7	16.7	10.6	0.0	0.5	0.4	2498	0.1	167.8	16.8	168.3	17.2
Backhoe/Front Loader	125	Diesel	1		7	4	0	20	Offroad	1	0.034	0.339	0.228	0.001	0.011	0.009	51.7	0.003	0.000	0.671	-	0.000	0.035	-	0.14	1.36	0.91	0.00	0.04	0.03	207	0.01	13.42	0.69	13.46	0.73	1.0	9.5	6.4	0.0	0.3	0.2	1448	0.1	93.9	4.9	94.2	5.1
D8	350	Diesel	2		7	2	0	2	Offroad	1	0.078	0.326	0.389	0.002	0.013	0.011	158.7	0.007	0.000	0.671	-	0.000	0.035	-	0.31	1.30	1.56	0.01	0.05	0.04	635	0.03	1.34	0.07	1.40	0.11	2.2	9.1	10.9	0.0	0.4	0.3	4443	0.2	9.4	0.5	9.8	0.8
Sag Cat w/ Winches	350	Diesel	2		14	2	0	2	Offroad	1	0.078	0.326	0.389	0.002	0.013	0.011	158.7	0.007	0.000	0.671	-	0.000	0.035	-	0.31	1.30	1.56	0.01	0.05	0.04	635	0.03	1.34	0.07	1.40	0.11	4.4	18.2	21.8	0.1	0.7	0.6	8886	0.4	18.8	1.0	19.5	1.6
Water Truck (extra)	300	Diesel	1		14	8	10	40	Onroad	1	0.001	0.007	0.008	0.000	0.000	0.000	2.9	0.000	0.006	0.280	-	0.001	0.028	-	0.06	0.37	0.39	0.00	0.02	0.01	143	0.00	11.25	1.13	11.26	1.15	0.8	5.2	5.4	0.0	0.2	0.2	2005	0.0	157.5	15.9	157.7	16.0
Lowboy Truck/Trailer	450	Diesel	2		14	2	10	10	Onroad	1	0.001	0.007	0.008	0.000	0.000	0.000	2.9	0.000	0.006	0.420	-	0.001	0.042	-	0.05	0.30	0.31	0.00	0.01	0.01	115	0.00	4.25	0.43	4.27	0.44	0.6	4.2	4.3	0.0	0.2	0.1	1604	0.0	59.5	6.1	59.7	6.2
Hughes 500E	450	Jet A	1		4	8	-	-	DETEC	1	1.704	2.118	1.537	1.548	0.047	0.047	815.6	0.224	0.000	0.000	0.000	0.000	0.000	0.000	13.63	16.94	12.29	12.39	0.38	0.38	6525	1.80	0.00	0.00	0.38	0.38	54.5	67.8	49.2	49.5	1.5	1.5	26100	7.2	0.0	0.0	1.5	1.5
Helicopter Fuel Truck	300	Diesel	1		4	8	50	10	Onroad	1	0.001	0.007	0.008	0.000	0.000	0.000	2.9	0.000	0.006	0.420	-	0.001	0.042	-	0.07	0.45	0.46	0.00	0.02	0.02	172	0.00	4.48	0.49	4.50	0.51	0.3	1.8	1.9	0.0	0.1	0.1	687	0.0	17.9	2.0	18.0	2.0
Transmission Shoofly Conductor/GW Removal (17) 84,000 Feet				14	11																			**Work Activity Subtotal**	21.23	59.89	57.06	12.53	2.25	1.85	20207	2.46	97.62	9.16	99.87	11.02	149.0	590.77	605.57	51.30	24.86	19.88	192766.32	15.50	1053.60	101.36	1078.47	121.24
Worker Vehicle	-	Gas	20		11	8	50	1	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.52	4.30	0.39	0.01	0.10	0.06	1132	0.04	0.22	0.03	0.32	0.09	5.7	47.3	4.2	0.1	1.1	0.7	12455	0.5	2.4	0.3	3.5	1.0
1-Ton Truck, 4x4	300	Gas	4		11	4	50	10	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.12	1.01	0.09	0.00	0.02	0.02	266	0.01	1.83	0.19	1.85	0.20	1.3	11.1	1.0	0.0	0.3	0.2	2931	0.1	20.1	2.1	20.4	2.2
Manlift/Bucket Truck	250	Diesel	2		11	8	10	10	Offroad	1	0.024	0.168	0.173	0.000	0.008	0.006	34.7	0.002	0.006	0.420	-	0.001	0.042	-	0.38	2.68	2.76	0.01	0.13	0.10	556	0.03	4.25	0.43	4.38	0.54	4.2	29.5	30.4	0.1	1.4	1.1	6111	0.4	46.8	4.8	48.2	5.9
Boom/Crane Truck	350	Diesel	2		11	8	10	10	Offroad	1	0.085	0.387	0.603	0.001	0.023	0.018	128.6	0.008	0.006	0.420	-	0.001	0.042	-	1.35	6.18	9.65	0.02	0.37	0.29	2058	0.12	4.25	0.43	4.62	0.73	14.9	68.0	106.2	0.2	4.0	3.2	22639	1.3	46.8	4.8	50.8	8.0
Puller	350	Diesel	1		7	8	10	10	Offroad	1	0.053	0.350	0.312	0.001	0.012	0.010	122.5	0.005	0.006	0.420	-	0.001	0.042	-	0.43	2.80	2.50	0.01	0.10	0.08	980	0.04	4.25	0.43	4.35	0.51	3.0	19.6	17.5	0.1	0.7	0.5	6860	0.3	29.8	3.0	30.5	3.6
Static Truck/ Tensioner	350	Diesel	1		7	8	10	10	Offroad	1	0.137	0.548	0.738	0.003	0.025	0.020	260.1	0.012	0.006	0.420	-	0.001	0.042	-	1.10	4.38	5.91	0.02	0.20	0.16	2081	0.10	4.25	0.43	4.45	0.59	7.7	30.7	41.3	0.1	1.4	1.1	14565	0.7	29.8	3.0	31.2	4.1
Dump/Stake Bed Truck	350	Diesel	1		11	8	50	20	Onroad	1	0.001	0.007	0.008	0.000	0.000	0.000	2.9	0.000	0.006	0.420	-	0.001	0.042	-	0.08	0.52	0.54	0.00	0.02	0.02	201	0.00	8.68	0.91	8.70	0.93	0.9	5.8	6.0	0.0	0.3	0.2	2206	0.0	95.5	10.0	95.7	10.2
Transmission Shoofly Pole Removal (18) 36 Poles				6	9																			**Work Activity Subtotal**	3.98	21.88	21.83	0.08	0.93	0.73	7274	0.35	27.74	2.86	28.67	3.59	37.6	211.93	206.57	0.70	9.08	7.07	67766.19	3.32	271.13	28.01	280.21	35.07
Worker Vehicle	-	Gas	4		9	8	50	1	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.10	0.86	0.08	0.00	0.02	0.01	226	0.01	0.22	0.03	0.24	0.04	0.9	7.7	0.7	0.0	0.2	0.1	2038	0.1	2.0	0.3	2.2	0.4
1-Ton Truck, 4x4	300	Gas	2		9	8	50	10	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.06	0.51	0.05	0.00	0.01	0.01	133	0.01	1.83	0.19	1.84	0.20	0.5	4.5	0.4	0.0	0.1	0.1	1199	0.0	16.5	1.7	16.6	1.8
Compressor Trailer	60	Diesel	1		9	4	10	10	Offroad	1	0.035	0.198	0.166	0.000	0.008	0.007	22.3	0.003	0.001	0.179	-	0.000	0.018	-	0.14	0.79	0.66	0.00	0.03	0.03	89	0.01	1.80	0.18	1.83	0.21	1.3	7.1	6.0	0.0	0.3	0.2	802	0.1	16.2	1.6	16.5	1.9
Manlift/Bucket Truck	250	Diesel	1		9	4	10	10	Offroad	1	0.024	0.168	0.173	0.000	0.008	0.006	34.7	0.002	0.006	0.420	-	0.001	0.042	-	0.10	0.67	0.69	0.00	0.03	0.03	139	0.01	4.25	0.43	4.29	0.46	0.9	6.0	6.2	0.0	0.3	0.2	1250	0.1	38.3	3.9	38.6	4.1
Boom/Crane Truck	350	Diesel	1		9	8	10	10	Offroad	1	0.085	0.387	0.603	0.001	0.023	0.018	128.6	0.008	0.006	0.420	-	0.001	0.042	-	0.68	3.09	4.83	0.01	0.18	0.15	1029	0.06	4.25	0.43	4.44	0.58	6.1	27.8	43.4	0.1	1.6	1.3	9261	0.5	38.3	3.9	39.9	5.2
Flatbed Truck	400	Diesel	1		9	8	10	10	Onroad	1	0.001	0.007	0.008	0.000	0.000	0.000	2.9	0.000	0.006	0.420	-	0.001	0.042	-	0.02	0.15	0.15	0.00	0.01	0.01	57	0.00	4.25	0.43	4.26	0.44	0.2	1.3	1.4	0.0	0.1	0.0	516	0.0	38.3	3.9	38.3	3.9
Transmission Guard Structure Removal (19) 4 Structures				6	1																			**Work Activity Subtotal**	1.10	6.07	6.46	0.02	0.29	0.22	1674	0.10	16.60	1.70	16.89	1.92	9.9	54.62	58.12	0.16	2.58	2.02	15065.84	0.88	149.43	15.29	152.01	17.31
Worker Vehicle	-	Gas	4		1	8	50	1	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.10	0.86	0.08	0.00	0.02	0.01	226	0.01	0.22	0.03	0.24	0.04	0.1	0.9	0.1	0.0	0.0	0.0	226	0.0	0.2	0.0	0.2	0.0
1-Ton Truck, 4x4	300	Gas	2		1	8	50	10	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.06	0.51	0.05	0.00	0.01	0.01	133	0.01	1.83	0.19	1.84	0.20	0.1	0.5	0.0	0.0	0.0	0.0	133	0.0	1.8	0.2	1.8	0.2
Compressor Trailer	60	Diesel	1		1	4	10	10	Offroad	1	0.035	0.198	0.166	0.000	0.008	0.007	22.3	0.003	0.001	0.179	-	0.000	0.018	-	0.14	0.79	0.66	0.00	0.03	0.03	89	0.01	1.80	0.18	1.83	0.21	0.1	0.8	0.7	0.0	0.0	0.0	89	0.0	1.8	0.2	1.8	0.2
Manlift/Bucket Truck	250	Diesel	1		1	4	10	10	Offroad	1	0.024	0.168	0.173	0.000	0.008	0.006	34.7	0.002	0.006	0.420	-	0.001	0.042	-	0.10	0.67	0.69	0.00	0.03	0.03	139	0.01	4.25	0.43	4.29	0.46	0.1	0.7	0.7	0.0	0.0	0.0	139	0.0	4.3	0.4	4.3	0.5
Boom/Crane Truck	350	Diesel	1		1	8	10	10	Offroad	1	0.085	0.387	0.603	0.001	0.023	0.018	128.6	0.008	0.006	0.420	-	0.001	0.042	-	0.68	3.09	4.83	0.01	0.18	0.15	1029	0.06	4.25	0.43	4.44	0.58	0.7	3.1	4.8	0.0	0.2	0.1	1029	0.1	4.3	0.4	4.4	0.6
Flatbed Truck	400	Diesel	1		1	8	10	10	Onroad	1	0.001	0.007	0.008	0.000	0.000	0.000	2.9	0.000	0.006	0.420	-	0.001	0.042	-	0.02	0.15	0.15	0.00	0.01	0.01	57	0.00	4.25	0.43	4.26	0.44	0.0	0.1	0.2	0.0	0.0	0.0	57	0.0	4.3	0.4	4.3	0.4
Transmission Restoration (20) 3 Miles				7	6																			**Work Activity Subtotal**	1.10	6.07	6.46	0.02	0.29	0.22	1674	0.10	16.60	1.70	16.89	1.92	1.1	6.07	6.46	0.02	0.29	0.22	1673.98	0.10	16.60	1.70	16.89	1.92
Worker Vehicle	-	Gas	5		6	8	50	1	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.13	1.07	0.10	0.00	0.02	0.02	283	0.01	0.22	0.03	0.24	0.04	0.8	6.4	0.6	0.0	0.1	0.1	1698	0.1	1.3	0.2	1.5	0.3
1-Ton Truck, 4x4	300	Gas	2		6	8	50	10	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.06	0.51	0.05	0.00	0.01	0.01	133	0.01	1.83	0.19	1.84	0.20	0.4	3.0	0.3	0.0	0.1	0.0	799	0.0	11.0	1.1	11.0	1.2
Backhoe/Front Loader	125	Diesel	1		6	4	0	20	Offroad	1	0.034	0.339	0.228	0.001	0.011	0.009	51.7	0.003	0.000	0.671	-	0.000	0.035	-	0.14	1.36	0.91	0.00	0.04	0.03	207	0.01	13.42	0.69	13.46	0.73	0.8	8.1	5.5	0.0	0.3	0.2	1241	0.1	80.5	4.2	80.8	4.4
Motor Grader	250	Diesel	1		6	4	0	20	Offroad	1	0.095	0.365	0.595	0.002	0.021	0.016	172.1	0.009	0.000	0.671	-	0.000	0.035	-	0.38	1.46	2.38	0.01	0.08	0.07	688	0.03	13.42	0.69	13.50	0.76	2.3	8.8	14.3	0.0	0.5	0.4	4131	0.2	80.5	4.2	81.0	4.6
Water Truck	300	Diesel	1		6	8	10	50	Onroad	1	0.001	0.007	0.008	0.000	0.000	0.000	2.9	0.000	0.006	0.280	-	0.001	0.028	-	0.07	0.45	0.46	0.00	0.02	0.02	172	0.00	14.04	1.41	14.06	1.43	0.4	2.7	2.8	0.0	0.1	0.1	1031	0.0	84.3	8.5	84.4	8.6
Drum Compactor	100	Diesel	1		6	4	0	20	Offroad	1	0.053	0.385	0.352	0.001	0.024	0.019	59.0	0.005	0.000	0.179	-	0.000	0.018	-	0.21	1.54	1.41	0.00	0.10	0.08	236	0.02	3.57	0.36	3.67	0.43	1.3	9.2	8.5	0.0	0.6	0.5	1416	0.1	21.4	2.1	22.0	2.6
Lowboy Truck/Trailer	450	Diesel	1		6	2	10	10	Onroad	1	0.001	0.007	0.008	0.000	0.000	0.000	2.9	0.000	0.006	0.420	-	0.001	0.042	-	0.02	0.15	0.15	0.00	0.01	0.01	57	0.00	4.25	0.43	4.26	0.44	0.1	0.9	0.9	0.0	0.0	0.0	344	0.0	25.5	2.6	25.6	2.6
Distribution Survey (21) 15 Removed/22 Removed and Replaced				4	5																			**Work Activity Subtotal**	1.01	6.54	5.46	0.02	0.28	0.22	1777	0.09	50.75	3.81	51.03	4.03	6.1	39.22	32.77	0.12	1.70	1.32	10660.52	0.51	304.51	22.84	306.21	24.16
Worker Vehicle	-	Gas	2		5	8	50	1	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.05	0.43	0.04	0.00	0.01	0.01	113	0.00	0.22	0.03	0.23	0.03	0.3	2.1	0.2	0.0	0.0	0.0	566	0.0	1.1	0.1	1.2	0.2
1-Ton Truck, 4x4	300	Gas	2		5	8	50	50	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.10	0.84	0.08	0.00	0.02	0.01	222	0.01	8.98	0.90	8.99	0.92	0.5	4.2	0.4	0.0	0.1	0.1	1110	0.0	44.9	4.5	45.0	4.6
Distribution Remove Existing Conductor (22) 3 Miles				14	4																			**Work Activity Subtotal**	0.15	1.27	0.11	0.00	0.03	0.02	335	0.01	9.20	0.93	9.22	0.95	0.8	6.36	0.57	0.02	0.15	0.10	1676.24	0.07	45.98	4.66	46.12	4.75
Worker Vehicle	-	Gas	12		4	8	50	1	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.31	2.58	0.23	0.01	0.06	0.04	679	0.03	0.22	0.03	0.28	0.07	1.2	10.3	0.9	0.0	0.2	0.2	2718	0.1	0.9	0.1	1.1	0.3
Bucket Trucks	350	Diesel	2		4	8	10	10	Offroad	1	0.024	0.168	0.173	0.000	0.008	0.006	34.7	0.002	0.001	0.179	-	0.000	0.018	-	0.38	2.68	2.76	0.01	0.13	0.10	556	0.03	1.80	0.18	1.92	0.28	1.5	10.7	11.0	0.0	0.5	0.4	2222	0.1	7.2	0.7	7.7	1.1
1-Ton Pickup Truck	300	Gas	1		4	8	50	10	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.03	0.25	0.02	0.00	0.01	0.00	67	0.00	1.83	0.19	1.83	0.19	0.1	1.0	0.1	0.0	0.0	0.0	266	0.0	7.3	0.8	7.3	0.8
1/2 –Ton Pickup Truck	350	Gas	1		3	4	50	10	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.03	0.25	0.02	0.00	0.01	0.00	67	0.00	1.83	0.19	1.83	0.19	0.1	0.8	0.1	0.0	0.0	0.0	200	0.0	5.5	0.6	5.5	0.6
Distribution Pole Removal (23) 37 Poles				6	20																			**Work Activity Subtotal**	0.75	5.77	3.04	0.01	0.20	0.15	1368	0.07	5.67	0.59	5.87	0.74	3.0	22.81	12.13	0.06	0.79	0.59	5405.94	0.26	20.86	2.16	21.65	2.75
Worker Vehicle	-	Gas	4		20	8	50	1	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.10	0.86	0.08	0.00	0.02	0.01	226	0.01	0.22	0.03	0.24	0.04	2.1	17.2	1.5	0.0	0.4	0.3	4529	0.2	4.4	0.6	4.8	0.8
Bucket Trucks	350	Diesel	2		20	8	10	10	Offroad	1	0.024	0.168	0.173	0.000	0.008	0.006	34.7	0.002	0.006	0.420	-	0.001	0.042	-	0.38	2.68	2.76	0.01	0.13	0.10	556	0.03	4.25	0.43	4.38	0.54	7.6	53.7	55.2	0.1	2.6	2.0	11111	0.7	85.1	8.7	87.6	10.7
1-Ton Pickup Truck	300	Gas	1		20	8	50	10	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.03	0.25	0.02	0.00	0.01	0.00	67	0.00	1.83	0.19	1.83	0.19	0.6	5.1	0.5	0.0	0.1	0.1	1332	0.1	36.6	3.8	36.7	3.9
1/2 –Ton Pickup Truck	350	Gas	1		20	4	50	10	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.03	0.25	0.02	0.00	0.01	0.00	67	0.00	1.83	0.19	1.83	0.19	0.6	5.1	0.5	0.0	0.1	0.1	1332	0.1	36.6	3.8	36.7	3.9
Bucket Trucks	350	Diesel	2		20	8	10	10	Offroad	1	0.024	0.168	0.173	0.000	0.008	0.006	34.7	0.002	0.006	0.420	-	0.001	0.042	-	0.38	2.68	2.76	0.01	0.13	0.10	556	0.03	4.25	0.43	4.38	0.54	7.6	53.7	55.2	0.1	2.6	2.0	11111	0.7	85.1	8.7	87.6	10.7
Distribution Pole Assembly and Set/Replacement (24) 22 Poles				4	10																			**Work Activity Subtotal**	0.93	6.73	5.65	0.02	0.29	0.22	1471	0.08	12.38	1.27	12.67	1.50	18.5	134.62	112.91	0.33	5.73	4.50	29415.30	1.65	247.67	25.46	253.41	29.96
Worker Vehicle	-	Gas	3		10	8	50	1	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.08	0.64	0.06	0.00	0.01	0.01	170	0.01	0.22	0.03	0.23	0.04	0.8	6.4	0.6	0.0	0.1	0.1	1698	0.1	2.2	0.3	2.3	0.4
Bucket Trucks	350	Diesel	2		10	8	10	10	Offroad	1	0.024	0.168	0.173	0.000	0.008	0.006	34.7	0.002	0.006	0.420	-	0.001	0.042	-	0.38	2.68	2.76	0.01	0.13	0.10	556	0.03	4.25	0.43	4.38	0.54	3.8	26.8	27.6	0.1	1.3	1.0	5555	0.3	42.5	4.3	43.8	5.4
1-Ton Pickup Truck	300	Gas	1		10	8	50	10	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.03	0.25	0.02	0.00	0.01	0.00	67	0.00	1.83	0.19	1.83	0.19	0.3	2.5	0.2	0.0	0.1	0.0	666	0.0	18.3	1.9	18.3	1.9
Distribution Install or Transfer Conductor (25) 3 Miles				14	11																			**Work Activity Subtotal**	0.49	3.58	2.84	0.01	0.15	0.12	792	0.04	6.30	0.65	6.45	0.77	4.9	35.80	28.42	0.09	1.48	1.16	7919.97	0.44	63.02	6.51	64.50	7.66
Worker Vehicle	-	Gas	12		4	8	50	1	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.31	2.58	0.23	0.01	0.06	0.04	679	0.03	0.22	0.03	0.28	0.07	1.2	10.3	0.9	0.0	0.2	0.2	2718	0.1	0.9	0.1	1.1	0.3
Bucket Trucks	350	Diesel	2		4	8	10	10	Offroad	1	0.024	0.168	0.173	0.000	0.008	0.006	34.7	0.002	0.006	0.420	-	0.001	0.042	-	0.38	2.68	2.76	0.01	0.13	0.10	556	0.03	4.25	0.43	4.38	0.54	1.5	10.7	11.0	0.0	0.5	0.4	2222	0.1	17.0	1.7	17.5	2.1
1-Ton Pickup Truck	300	Gas	1		4	8	50	10	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.03	0.25	0.02	0.00	0.01	0.00	67	0.00	1.83	0.19	1.83	0.19	0.1	1.0	0.1	0.0	0.0	0.0	266	0.0	7.3	0.8	7.3	0.8
1/2 –Ton Pickup Truck	350	Gas	1		3	4	50	10	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.03	0.25	0.02	0.00	0.01	0.00	67	0.00	1.83	0.19	1.83	0.19	0.1	0.8	0.1	0.0	0.0	0.0	200	0.0	5.5	0.6	5.5	0.6
Distribution Restoration (26) 37 Sites				5	5																			**Work Activity Subtotal**	0.75	5.77	3.04	0.01	0.20	0.15	1368	0.07	8.13	0.84	8.33	0.99	3.0	22.81	12.13	0.06	0.79	0.59	5405.94	0.26	30.69	3.17	31.48	3.76
Worker Vehicle	-	Gas	3		9	8	50	1	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.08	0.64	0.06	0.00	0.01	0.01	170	0.01	0.22	0.03	0.23	0.04	0.7	5.8	0.5	0.0	0.1	0.1	1529	0.1	2.0	0.3	2.1	0.3
1-Ton Truck, 4x4	300	Gas	2		5	8	50	10	Onroad	1	0.001	0.004	0.000	0.000	0.000	0.000	1.1	0.000	0.001	0.179	-	0.000	0.018	-	0.06	0.51	0.05	0.00	0.01	0.01	133	0.01	1.83	0.19	1.84	0.20	0.3	2.5	0.2	0.0	0.1	0.0	666	0.0	9.1	0.9	9.2	1.0
Backhoe/Front Loader	125	Diesel	1		5	8	0	40	Offroad	1	0.034	0.339	0.228	0.001	0.011	0.009	51.7	0.003	0.000	0.671	-	0.000	0.035	-	0.27	2.72	1.82	0.00	0.09	0.07	414	0.02	26.83	1.39	26.92	1.46	1.4	13.6	9.1	0.0	0.4	0.3	2069	0.1	134.2	6.9	134.6	7.3
Water Truck	300	Diesel	1		5	6	10	50	Onroad	1	0.001	0.007	0.008	0.000	0.000	0.000	2.9	0.000	0.006	0.280	-	0.001	0.028	-	0.07	0.45	0.46	0.00	0.02	0.02	172	0.00	14.04	1.41	14.06	1.43	0.3	2.2	2.3	0.0	0.1	0.1	859	0.0	70.2	7.1	70.3	7.1
Lowboy Truck/Trailer	450	Diesel	1		5	4	10	10	Onroad	1	0.001	0.007	0.008	0.000	0.000	0.000	2.9	0.000	0.006	0.420	-	0.001	0.042	-	0.02	0.15	0.15	0.00	0.01	0.01	57	0.00	4.25	0.43	4.26	0.44	0.1	0.7	0.8	0.0	0.0	0.0	286	0.0	21.3	2.2	21.3	2.2
																								Work Activity Subtotal	0.50	4.46	2.54	0.01	0.14	0.11	946	0.04	47.18	3.45	47.32	3.56	2.8	24.90	12.94	0.06	0.75	0.57	5409.52	0.23	236.77	17.36	237.53	17.93
																																				Total Project (lbs)	760	4328	3806	98	170	134	1136801	70	15032	1453	15202	1586
																																				Total Project (tons)	0.4	2.2	1.9	0.0	0.1	0.1	568.4	0.0	7.5	0.7	7.6	0.8

SCAB Fleet Average Emission Factors (Diesel)

2021

Air Basin	SC

		(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
Equipment	**MaxHP**	**ROG**	**CO**	**NOX**	**SOX**	**PM**	**CO2**	**CH4**
Aerial Lifts	15	0.0101	0.0528	0.0631	0.0001	0.0025	8.7	0.0009
	25	0.0136	0.0456	0.0849	0.0001	0.0034	11.0	0.0012
	50	0.0233	0.1405	0.1369	0.0003	0.0061	19.6	0.0021
	120	0.0234	0.2280	0.1978	0.0004	0.0110	38.1	0.0021
	500	0.0703	0.3769	0.6021	0.0021	0.0189	213	0.0063
	750	0.1283	0.6813	1.1121	0.0039	0.0346	385	0.0116
Aerial Lifts Composite		0.0238	0.1677	0.1726	0.0004	0.0080	34.7	0.0021
Air Compressors	15	0.0092	0.0449	0.0569	0.0001	0.0027	7.2	0.0008
	25	0.0192	0.0623	0.1145	0.0002	0.0052	14.4	0.0017
	50	0.0355	0.1979	0.1659	0.0003	0.0085	22.3	0.0032
	120	0.0371	0.3037	0.2570	0.0006	0.0160	47.0	0.0033
	175	0.0541	0.4975	0.3498	0.0010	0.0183	88.5	0.0049
	250	0.0626	0.2564	0.4359	0.0015	0.0141	131	0.0056
	500	0.1075	0.4350	0.6881	0.0023	0.0240	232	0.0097
	750	0.1667	0.6723	1.0871	0.0036	0.0376	358	0.0150
	1000	0.2459	0.9751	3.0739	0.0049	0.0717	486	0.0222
Air Compressors Composite		0.0442	0.3051	0.2928	0.0007	0.0158	63.6	0.0040
Bore/Drill Rigs	15	0.0120	0.0632	0.0754	0.0002	0.0029	10.3	0.0011
	25	0.0193	0.0658	0.1219	0.0002	0.0046	16.0	0.0017
	50	0.0193	0.2202	0.1710	0.0004	0.0015	31.0	0.0017
	120	0.0269	0.4661	0.2191	0.0009	0.0030	77.1	0.0024
	175	0.0373	0.7542	0.1473	0.0016	0.0039	141	0.0034
	250	0.0456	0.3426	0.1364	0.0021	0.0041	188	0.0041

	500	0.0753	0.5512	0.2223	0.0031	0.0068	311	0.0068
	750	0.1488	1.0889	0.4398	0.0062	0.0134	615	0.0134
	1000	0.2329	1.6434	3.9539	0.0093	0.0472	928	0.0210
Bore/Drill Rigs Composite		0.0460	0.5007	0.3219	0.0017	0.0053	165	0.0042
Cement and Morta	15	0.0074	0.0386	0.0461	0.0001	0.0018	6.3	0.0007
	25	0.0220	0.0736	0.1365	0.0002	0.0056	17.6	0.0020
Cement and Mortar Mixers Composite		0.0086	0.0415	0.0535	0.0001	0.0021	7.2	0.0008
Concrete/Industria	25	0.0199	0.0678	0.1256	0.0002	0.0047	16.5	0.0018
	50	0.0384	0.2382	0.2160	0.0004	0.0098	30.2	0.0035
	120	0.0483	0.4598	0.3802	0.0009	0.0217	74.1	0.0044
	175	0.0808	0.8662	0.5793	0.0018	0.0286	160	0.0073
Concrete/Industrial Saws Composite		0.0444	0.3761	0.3176	0.0007	0.0171	58.5	0.0040
Cranes	50	0.0483	0.2377	0.1837	0.0003	0.0107	23.2	0.0044
	120	0.0499	0.3428	0.3072	0.0006	0.0210	50.1	0.0045
	175	0.0601	0.4750	0.3641	0.0009	0.0197	80.3	0.0054
	250	0.0667	0.2407	0.4404	0.0013	0.0152	112	0.0060
	500	0.1035	0.3747	0.6303	0.0018	0.0231	180	0.0093
	750	0.1746	0.6301	1.0891	0.0030	0.0393	303	0.0158
	9999	0.6375	2.1272	6.6964	0.0098	0.1645	971	0.0575
Cranes Composite		0.0846	0.3865	0.6033	0.0014	0.0229	129	0.0076
Crawler Tractors	50	0.0649	0.2722	0.2046	0.0003	0.0136	24.9	0.0059
	120	0.0780	0.4606	0.4585	0.0008	0.0336	65.8	0.0070
	175	0.1054	0.7292	0.6524	0.0014	0.0362	121	0.0095
	250	0.1123	0.3881	0.7899	0.0019	0.0285	166	0.0101
	500	0.1669	0.6452	1.1075	0.0025	0.0412	259	0.0151
	750	0.3006	1.1555	2.0421	0.0047	0.0750	465	0.0271
	1000	0.4584	1.7742	4.9834	0.0066	0.1317	658	0.0414
Crawler Tractors Composite		0.0988	0.5208	0.6239	0.0013	0.0343	114	0.0089
Crushing/Proc. Eq	50	0.0668	0.3978	0.3262	0.0006	0.0156	44.0	0.0060
	120	0.0641	0.5430	0.4374	0.0010	0.0261	83.1	0.0058
	175	0.1015	0.9522	0.6223	0.0019	0.0324	167	0.0092
	250	0.1182	0.4815	0.7556	0.0028	0.0248	245	0.0107

	500	0.1765	0.7050	1.0353	0.0037	0.0366	374	0.0159
	750	0.2779	1.1108	1.6653	0.0059	0.0578	589	0.0251
	9999	0.7241	2.6136	8.0264	0.0131	0.1854	1,308	0.0653
Crushing/Proc. Equipment Composite		0.0872	0.6224	0.5412	0.0015	0.0270	132	0.0079
Dumpers/Tenders	25	0.0092	0.0314	0.0581	0.0001	0.0022	7.6	0.0008
Dumpers/Tenders Composite		0.0092	0.0314	0.0581	0.0001	0.0022	7.6	0.0008
Excavators	25	0.0198	0.0677	0.1253	0.0002	0.0047	16.4	0.0018
	50	0.0356	0.2421	0.1802	0.0003	0.0068	25.0	0.0032
	120	0.0543	0.4967	0.3429	0.0009	0.0174	73.6	0.0049
	175	0.0655	0.6637	0.3377	0.0013	0.0168	112	0.0059
	250	0.0783	0.3258	0.3891	0.0018	0.0134	159	0.0071
	500	0.1137	0.4561	0.5254	0.0023	0.0191	234	0.0103
	750	0.1885	0.7559	0.8840	0.0039	0.0319	387	0.0170
Excavators Composite		0.0687	0.5113	0.3577	0.0013	0.0158	120	0.0062
Forklifts	50	0.0175	0.1376	0.1034	0.0002	0.0032	14.7	0.0016
	120	0.0207	0.2091	0.1321	0.0004	0.0059	31.2	0.0019
	175	0.0305	0.3303	0.1503	0.0006	0.0069	56.1	0.0027
	250	0.0354	0.1548	0.1554	0.0009	0.0050	77.1	0.0032
	500	0.0506	0.2120	0.2091	0.0011	0.0070	111	0.0046
Forklifts Composite		0.0294	0.2148	0.1459	0.0006	0.0056	54.4	0.0027
Generator Sets	15	0.0114	0.0635	0.0800	0.0002	0.0036	10.2	0.0010
	25	0.0221	0.0761	0.1397	0.0002	0.0061	17.6	0.0020
	50	0.0338	0.2115	0.2116	0.0004	0.0091	30.6	0.0030
	120	0.0456	0.4617	0.3996	0.0009	0.0215	77.9	0.0041
	175	0.0617	0.7313	0.5233	0.0016	0.0233	142	0.0056
	250	0.0694	0.3807	0.6568	0.0024	0.0190	213	0.0063
	500	0.1052	0.5913	0.9401	0.0033	0.0291	337	0.0095
	750	0.1717	0.9545	1.5502	0.0055	0.0475	544	0.0155
	9999	0.4120	1.9665	6.2664	0.0105	0.1316	1,049	0.0372
Generator Sets Composite		0.0363	0.2708	0.2978	0.0007	0.0131	61.0	0.0033
Graders	50	0.0516	0.2718	0.2089	0.0004	0.0109	27.5	0.0047
	120	0.0684	0.5069	0.4241	0.0009	0.0272	75.0	0.0062

	175	0.0854	0.7277	0.5015	0.0014	0.0267	124	0.0077
	250	0.0947	0.3647	0.5955	0.0019	0.0205	172	0.0085
	500	0.1222	0.4875	0.7112	0.0023	0.0258	229	0.0110
	750	0.2598	1.0314	1.5507	0.0049	0.0555	486	0.0234
Graders Composite		0.0861	0.5747	0.5213	0.0015	0.0247	133	0.0078
Off-Highway Tract	120	0.1378	0.6749	0.7959	0.0011	0.0626	93.7	0.0124
	175	0.1379	0.8000	0.9027	0.0015	0.0507	130	0.0124
	250	0.1087	0.3507	0.8198	0.0015	0.0320	130	0.0098
	750	0.4454	1.7945	3.3054	0.0057	0.1282	568	0.0402
	1000	0.6794	2.8019	7.1274	0.0082	0.2070	814	0.0613
Off-Highway Tractors Composite		0.1394	0.6413	0.9902	0.0017	0.0459	151	0.0126
Off-Highway Truck	175	0.0782	0.7537	0.4000	0.0014	0.0203	125	0.0071
	250	0.0879	0.3493	0.4383	0.0019	0.0151	167	0.0079
	500	0.1415	0.5407	0.6543	0.0027	0.0240	272	0.0128
	750	0.2297	0.8769	1.0788	0.0044	0.0391	442	0.0207
	1000	0.3421	1.2771	3.7016	0.0063	0.0814	625	0.0309
Off-Highway Trucks Composite		0.1370	0.5476	0.7382	0.0027	0.0246	260	0.0124
Other Construction	15	0.0118	0.0617	0.0737	0.0002	0.0029	10.1	0.0011
	25	0.0159	0.0544	0.1008	0.0002	0.0038	13.2	0.0014
	50	0.0303	0.2243	0.1893	0.0004	0.0067	28.0	0.0027
	120	0.0468	0.5069	0.3537	0.0009	0.0169	80.9	0.0042
	175	0.0491	0.5858	0.2972	0.0012	0.0142	107	0.0044
	500	0.0961	0.4654	0.5253	0.0025	0.0185	254	0.0087
Other Construction Equipment Comp		0.0534	0.3497	0.3120	0.0013	0.0121	122	0.0048
Other General Ind	15	0.0066	0.0391	0.0466	0.0001	0.0018	6.4	0.0006
	25	0.0185	0.0632	0.1170	0.0002	0.0044	15.3	0.0017
	50	0.0388	0.2161	0.1676	0.0003	0.0086	21.7	0.0035
	120	0.0551	0.4205	0.3467	0.0007	0.0218	62.0	0.0050
	175	0.0664	0.5654	0.3871	0.0011	0.0205	95.9	0.0060
	250	0.0739	0.2775	0.4574	0.0015	0.0149	136	0.0067
	500	0.1411	0.5167	0.8006	0.0026	0.0282	265	0.0127
	750	0.2333	0.8515	1.3488	0.0044	0.0470	437	0.0210

	1000	0.3231	1.1617	3.6053	0.0056	0.0863	560	0.0292
Other General Industrial Equipmen C		0.0915	0.4479	0.5887	0.0016	0.0227	152	0.0083
Other Material Har	50	0.0535	0.2980	0.2331	0.0004	0.0120	30.3	0.0048
	120	0.0533	0.4091	0.3386	0.0007	0.0213	60.7	0.0048
	175	0.0837	0.7158	0.4921	0.0014	0.0261	122	0.0075
	250	0.0781	0.2953	0.4889	0.0016	0.0159	145	0.0070
	500	0.1007	0.3715	0.5777	0.0019	0.0203	192	0.0091
	9999	0.4606	1.5333	4.7673	0.0073	0.1140	741	0.0416
Other Material Handling Equipment C		0.0860	0.4392	0.5748	0.0015	0.0218	141	0.0078
Pavers	25	0.0225	0.0768	0.1425	0.0002	0.0055	18.7	0.0020
	50	0.0774	0.2996	0.2332	0.0004	0.0168	28.0	0.0070
	120	0.0855	0.4780	0.5137	0.0008	0.0391	69.2	0.0077
	175	0.1148	0.7586	0.7520	0.0014	0.0421	128	0.0104
	250	0.1338	0.4598	1.0174	0.0022	0.0371	194	0.0121
	500	0.1518	0.6069	1.0951	0.0023	0.0410	233	0.0137
Pavers Composite		0.0928	0.4878	0.5089	0.0009	0.0325	77.9	0.0084
Paving Equipment	25	0.0152	0.0520	0.0963	0.0002	0.0036	12.6	0.0014
	50	0.0648	0.2524	0.1987	0.0003	0.0143	23.9	0.0058
	120	0.0662	0.3741	0.4010	0.0006	0.0307	54.5	0.0060
	175	0.0888	0.5934	0.5867	0.0011	0.0329	101	0.0080
	250	0.0820	0.2827	0.6331	0.0014	0.0227	122	0.0074
Paving Equipment Composite		0.0710	0.4062	0.4462	0.0008	0.0288	68.9	0.0064
Plate Compactors	15	0.0050	0.0263	0.0314	0.0001	0.0012	4.3	0.0005
Plate Compactors Composite		0.0050	0.0263	0.0314	0.0001	0.0012	4.3	0.0005
Pressure Washers	15	0.0055	0.0304	0.0383	0.0001	0.0017	4.9	0.0005
	25	0.0090	0.0308	0.0566	0.0001	0.0025	7.1	0.0008
	50	0.0113	0.0841	0.0949	0.0002	0.0035	14.3	0.0010
	120	0.0114	0.1362	0.1182	0.0003	0.0056	24.1	0.0010
Pressure Washers Composite		0.0079	0.0543	0.0625	0.0001	0.0027	9.4	0.0007
Pumps	15	0.0094	0.0462	0.0585	0.0001	0.0028	7.4	0.0008
	25	0.0259	0.0841	0.1544	0.0002	0.0070	19.5	0.0023
	50	0.0415	0.2490	0.2404	0.0004	0.0108	34.3	0.0037

	120	0.0484	0.4687	0.4054	0.0009	0.0227	77.9	0.0044
	175	0.0652	0.7325	0.5249	0.0016	0.0242	140	0.0059
	250	0.0707	0.3662	0.6331	0.0023	0.0187	201	0.0064
	500	0.1162	0.6131	0.9769	0.0034	0.0310	345	0.0105
	750	0.1939	1.0135	1.6500	0.0057	0.0519	571	0.0175
	9999	0.5635	2.5731	8.1862	0.0136	0.1751	1,355	0.0508
Pumps Composite		0.0344	0.2652	0.2637	0.0006	0.0128	49.6	0.0031
Rollers	15	0.0074	0.0386	0.0461	0.0001	0.0018	6.3	0.0007
	25	0.0161	0.0549	0.1017	0.0002	0.0038	13.3	0.0015
	50	0.0491	0.2389	0.1979	0.0003	0.0114	26.0	0.0044
	120	0.0529	0.3854	0.3524	0.0007	0.0238	59.0	0.0048
	175	0.0719	0.6108	0.4775	0.0012	0.0254	108	0.0065
	250	0.0800	0.3158	0.5870	0.0017	0.0201	153	0.0072
	500	0.1100	0.4490	0.7481	0.0022	0.0270	219	0.0099
Rollers Composite		0.0540	0.3816	0.3483	0.0008	0.0206	67.0	0.0049
Rough Terrain For	50	0.0479	0.3133	0.2472	0.0004	0.0105	33.9	0.0043
	120	0.0461	0.4131	0.3062	0.0007	0.0168	62.4	0.0042
	175	0.0736	0.7229	0.4132	0.0014	0.0213	125	0.0066
	250	0.0832	0.3419	0.4658	0.0019	0.0158	171	0.0075
	500	0.1228	0.4904	0.6343	0.0025	0.0231	257	0.0111
Rough Terrain Forklifts Composite		0.0497	0.4454	0.3193	0.0008	0.0172	70.3	0.0045
Rubber Tired Doze	175	0.1432	0.8097	0.9278	0.0015	0.0522	129	0.0129
	250	0.1616	0.5121	1.1988	0.0021	0.0475	183	0.0146
	500	0.2182	0.8829	1.5670	0.0026	0.0622	265	0.0197
	750	0.3297	1.3266	2.4124	0.0040	0.0946	399	0.0297
	1000	0.5186	2.1395	5.3122	0.0060	0.1566	592	0.0468
Rubber Tired Dozers Composite		0.2015	0.7661	1.4661	0.0025	0.0582	239	0.0182
Rubber Tired Load	25	0.0204	0.0697	0.1291	0.0002	0.0048	16.9	0.0018
	50	0.0561	0.3032	0.2349	0.0004	0.0120	31.1	0.0051
	120	0.0520	0.3960	0.3271	0.0007	0.0206	58.9	0.0047
	175	0.0712	0.6211	0.4192	0.0012	0.0222	106	0.0064
	250	0.0804	0.3129	0.5008	0.0017	0.0173	149	0.0073

	500	0.1240	0.4920	0.7143	0.0023	0.0260	237	0.0112
	750	0.2549	1.0075	1.5039	0.0049	0.0540	486	0.0230
	1000	0.3298	1.2808	3.8115	0.0060	0.0894	594	0.0298
Rubber Tired Loaders Composite		0.0705	0.4381	0.4275	0.0012	0.0206	109	0.0064
Scrapers	120	0.1142	0.6580	0.6720	0.0011	0.0501	93.9	0.0103
	175	0.1316	0.8907	0.8250	0.0017	0.0460	148	0.0119
	250	0.1442	0.4935	1.0349	0.0024	0.0374	209	0.0130
	500	0.2102	0.8168	1.4242	0.0032	0.0531	321	0.0190
	750	0.3649	1.4095	2.5312	0.0056	0.0932	555	0.0329
Scrapers Composite		0.1815	0.7745	1.2263	0.0027	0.0492	262	0.0164
Signal Boards	15	0.0072	0.0377	0.0450	0.0001	0.0018	6.2	0.0006
	50	0.0455	0.2789	0.2549	0.0005	0.0114	36.2	0.0041
	120	0.0513	0.4930	0.4078	0.0009	0.0230	80.2	0.0046
	175	0.0757	0.8277	0.5557	0.0017	0.0267	155	0.0068
	250	0.0968	0.4734	0.7633	0.0029	0.0235	255	0.0087
Signal Boards Composite		0.0125	0.0911	0.0863	0.0002	0.0039	16.7	0.0011
Skid Steer Loaders	25	0.0169	0.0572	0.1065	0.0002	0.0042	13.8	0.0015
	50	0.0220	0.1998	0.1600	0.0003	0.0036	25.5	0.0020
	120	0.0207	0.2671	0.1538	0.0005	0.0053	42.8	0.0019
Skid Steer Loaders Composite		0.0212	0.2119	0.1544	0.0004	0.0042	30.3	0.0019
Surfacing Equipme	50	0.0242	0.1170	0.1037	0.0002	0.0057	14.1	0.0022
	120	0.0525	0.4008	0.3760	0.0007	0.0242	63.8	0.0047
	175	0.0511	0.4658	0.3757	0.0010	0.0189	85.8	0.0046
	250	0.0617	0.2715	0.5141	0.0015	0.0170	135	0.0056
	500	0.0959	0.4602	0.7556	0.0022	0.0261	221	0.0087
	750	0.1520	0.7215	1.2216	0.0035	0.0416	347	0.0137
Surfacing Equipment Composite		0.0779	0.3860	0.5953	0.0017	0.0216	166	0.0070
Sweepers/Scrubbe	15	0.0124	0.0729	0.0870	0.0002	0.0034	11.9	0.0011
	25	0.0237	0.0808	0.1495	0.0002	0.0056	19.6	0.0021
	50	0.0391	0.2844	0.2261	0.0004	0.0081	31.6	0.0035
	120	0.0510	0.4931	0.3380	0.0009	0.0173	75.0	0.0046
	175	0.0774	0.8017	0.4205	0.0016	0.0208	139	0.0070

	250	0.0744	0.3184	0.3827	0.0018	0.0125	162	0.0067
Sweepers/Scrubbers Composite		0.0536	0.4882	0.3225	0.0009	0.0151	78.5	0.0048
Tractors/Loaders/E	25	0.0191	0.0653	0.1209	0.0002	0.0045	15.9	0.0017
	50	0.0376	0.2733	0.2108	0.0004	0.0073	30.3	0.0034
	120	0.0340	0.3394	0.2275	0.0006	0.0108	51.7	0.0031
	175	0.0533	0.5841	0.2798	0.0011	0.0135	101	0.0048
	250	0.0769	0.3430	0.3814	0.0019	0.0131	172	0.0069
	500	0.1523	0.6596	0.7068	0.0039	0.0255	345	0.0137
	750	0.2284	0.9891	1.0736	0.0058	0.0385	517	0.0206
Tractors/Loaders/Backhoes Composi		0.0407	0.3606	0.2506	0.0008	0.0113	66.8	0.0037
Trenchers	15	0.0099	0.0517	0.0617	0.0001	0.0024	8.5	0.0009
	25	0.0397	0.1355	0.2509	0.0004	0.0094	32.9	0.0036
	50	0.0921	0.3425	0.2729	0.0004	0.0201	32.9	0.0083
	120	0.0799	0.4419	0.4914	0.0008	0.0375	64.9	0.0072
	175	0.1272	0.8376	0.8675	0.0016	0.0481	144	0.0115
	250	0.1517	0.5327	1.2061	0.0025	0.0445	223	0.0137
	500	0.1992	0.8364	1.5150	0.0031	0.0571	311	0.0180
	750	0.3775	1.5747	2.9328	0.0059	0.1091	587	0.0341
Trenchers Composite		0.0874	0.4226	0.4327	0.0007	0.0309	58.7	0.0079
Welders	15	0.0079	0.0386	0.0489	0.0001	0.0024	6.2	0.0007
	25	0.0150	0.0487	0.0894	0.0001	0.0040	11.3	0.0014
	50	0.0387	0.2163	0.1893	0.0003	0.0094	26.0	0.0035
	120	0.0291	0.2492	0.2134	0.0005	0.0131	39.5	0.0026
	175	0.0552	0.5383	0.3833	0.0011	0.0194	98.2	0.0050
	250	0.0515	0.2269	0.3907	0.0013	0.0123	119	0.0046
	500	0.0703	0.3086	0.4915	0.0016	0.0167	168	0.0063
Welders Composite		0.0280	0.1788	0.1635	0.0003	0.0088	25.6	0.0025

Highest (Most Conservative) EMFAC2007 (version 2.3)
Emission Factors for On-Road Passenger Vehicles & Delivery Trucks

Projects in the SCAQMD (Scenario Years 2007 - 2026)

Derived from Peak Emissions Inventory (**Winter**, **Annual**, **Summer**)

Vehicle Class:

Passenger Vehicles (<8500 pounds) & Delivery Trucks (>8500 pounds)

The following emission factors were compiled by running the California Air Resources Board's EMFAC2007 (version 2.3) Burden Model, taking the weighted average of vehicle types and simplifying into two categories:

Passenger Vehicles & Delivery Trucks.

These emission factors can be used to calculate on-road mobile source emissions for the vehicle categories listed in the tables below, by use of the following equation:

Emissions (pounds per day) = N x TL x EF

where N = number of trips, TL = trip length (miles/day), and EF = emission factor (pounds per mile)

This methodology replaces the old EMFAC emission factors in Tables A-9-5-J-1 through A-9-5-L in Appendix A9 of the current SCAQMD CEQA Handbook. All the emission factors account for the emissions from start, running and idling exhaust. In addition, the ROG emission factors include diurnal, hot soak, running and resting emissions, and the PM10 & PM2.5 emission factors include tire and brake wear.

Scenario Year: **2007**

All model years in the range 1965 to 2007

Passenger Vehicles (pounds/mile)	
CO	**0.01155158**
NOx	**0.00121328**
ROG	**0.00118234**
SOx	**0.00001078**
PM10	**0.00008447**
PM2.5	**0.00005243**
CO2	**1.10672236**
CH4	**0.00010306**

Delivery Trucks (pounds/mile)	
CO	**0.02407553**
NOx	**0.02508445**
ROG	**0.00323145**
SOx	**0.00002626**
PM10	**0.00091020**
PM2.5	**0.00078884**
CO2	**2.72245619**
CH4	**0.00016030**

Scenario Year: **2008**

All model years in the range 1965 to 2008

Passenger Vehicles (pounds/mile)	
CO	**0.01054844**
NOx	**0.00110288**
ROG	**0.00107919**
SOx	**0.00001075**
PM10	**0.00008505**
PM2.5	**0.00005293**
CO2	**1.09953226**
CH4	**0.00009465**

Delivery Trucks (pounds/mile)	
CO	**0.02194915**
NOx	**0.02371258**
ROG	**0.00299270**
SOx	**0.00002565**
PM10	**0.00085607**
PM2.5	**0.00073933**
CO2	**2.71943400**
CH4	**0.00014769**

Scenario Year: **2009**

All model years in the range 1965 to 2009

Passenger Vehicles (pounds/mile)

Delivery Trucks (pounds/mile)

Scenario Year: **2010**

All model years in the range 1966 to 2010

Passenger Vehicles (pounds/mile)

Delivery Trucks (pounds/mile)

CO	**0.00968562**
NOx	**0.00100518**
ROG	**0.00099245**
SOx	**0.00001066**
PM10	**0.00008601**
PM2.5	**0.00005384**
CO2	**1.09755398**
CH4	**0.00008767**

CO	**0.02016075**
NOx	**0.02236636**
ROG	**0.00278899**
SOx	**0.00002679**
PM10	**0.00080550**
PM2.5	**0.00069228**
CO2	**2.72330496**
CH4	**0.00013655**

CO	**0.00826276**
NOx	**0.00091814**
ROG	**0.00091399**
SOx	**0.00001077**
PM10	**0.00008698**
PM2.5	**0.00005478**
CO2	**1.09568235**
CH4	**0.00008146**

CO	**0.01843765**
NOx	**0.02062460**
ROG	**0.00258958**
SOx	**0.00002701**
PM10	**0.00075121**
PM2.5	**0.00064233**
CO2	**2.73222199**
CH4	**0.00012576**

Highest (Most Conservative) EMFAC2007 (version 2.3)
Emission Factors for On-Road Passenger Vehicles & Delivery Trucks

Projects in the SCAQMD (Scenario Years 2007 - 2026)

Derived from Peak Emissions Inventory (**Winter**, **Annual**, **Summer**)

Vehicle Class:

Passenger Vehicles (<8500 pounds) & Delivery Trucks (>8500 pounds)

Scenario Year: **2011**

All model years in the range 1967 to 2011

Passenger Vehicles (pounds/mile)	
CO	**0.00826276**
NOx	**0.00084460**
ROG	**0.00085233**
SOx	**0.00001077**
PM10	**0.00008879**
PM2.5	**0.00005653**
CO2	**1.10235154**
CH4	**0.00007678**

Delivery Trucks (pounds/mile)	
CO	**0.01693242**
NOx	**0.01893366**
ROG	**0.00241868**
SOx	**0.00002728**
PM10	**0.00070097**
PM2.5	**0.00059682**
CO2	**2.75180822**
CH4	**0.00011655**

Scenario Year: **2012**

All model years in the range 1968 to 2012

Passenger Vehicles (pounds/mile)	
CO	**0.00765475**
NOx	**0.00077583**
ROG	**0.00079628**
SOx	**0.00001073**
PM10	**0.00008979**
PM2.5	**0.00005750**
CO2	**1.10152540**
CH4	**0.00007169**

Delivery Trucks (pounds/mile)	
CO	**0.01545741**
NOx	**0.01732423**
ROG	**0.00223776**
SOx	**0.00002667**
PM10	**0.00064975**
PM2.5	**0.00054954**
CO2	**2.76628414**
CH4	**0.00010668**

Scenario Year: **2013**

All model years in the range 1969 to 2013

Passenger Vehicles (pounds/mile)	
CO	**0.00709228**

Delivery Trucks (pounds/mile)	
CO	**0.01407778**

Scenario Year: **2014**

All model years in the range 1970 to 2014

Passenger Vehicles (pounds/mile)	
CO	**0.00660353**

Delivery Trucks (pounds/mile)	
CO	**0.01284321**

NOx	0.00071158
ROG	0.00074567
SOx	0.00001072
PM10	0.00009067
PM2.5	0.00005834
CO2	1.10087435
CH4	0.00006707

NOx	0.01577311
ROG	0.00206295
SOx	0.00002682
PM10	0.00059956
PM2.5	0.00050174
CO2	2.78163459
CH4	0.00009703

NOx	0.00065484
ROG	0.00070227
SOx	0.00001069
PM10	0.00009185
PM2.5	0.00005939
CO2	1.10257205
CH4	0.00006312

NOx	0.01425162
ROG	0.00189649
SOx	0.00002754
PM10	0.00054929
PM2.5	0.00045519
CO2	2.79845465
CH4	0.00008798

Scenario Year: **2015**

All model years in the range 1971 to 2015

Passenger Vehicles (pounds/mile)	
CO	0.00614108
NOx	0.00060188
ROG	0.00066355
SOx	0.00001070
PM10	0.00009259
PM2.5	0.00006015
CO2	1.10192837
CH4	0.00005923

Delivery Trucks (pounds/mile)	
CO	0.01169445
NOx	0.01285026
ROG	0.00173890
SOx	0.00002741
PM10	0.00050307
PM2.5	0.00041268
CO2	2.81247685
CH4	0.00008076

Scenario Year: **2016**

All model years in the range 1972 to 2016

Passenger Vehicles (pounds/mile)	
CO	0.00575800
NOx	0.00055658
ROG	0.00063254
SOx	0.00001071
PM10	0.00009392
PM2.5	0.00006131
CO2	1.10677664
CH4	0.00005623

Delivery Trucks (pounds/mile)	
CO	0.01080542
NOx	0.01172881
ROG	0.00161521
SOx	0.00002767
PM10	0.00046606
PM2.5	0.00037868
CO2	2.83134285
CH4	0.00007355

Highest (Most Conservative) EMFAC2007 (version 2.3)
Emission Factors for On-Road Passenger Vehicles & Delivery Trucks
Projects in the SCAQMD (Scenario Years 2007 - 2026)
Derived from Peak Emissions Inventory (**Winter**, **Annual**, **Summer**)

Vehicle Class:

Passenger Vehicles (<8500 pounds) & Delivery Trucks (>8500 pounds)

Scenario Year: **2017**

All model years in the range 1973 to 2017

Passenger Vehicles (pounds/mile)	Delivery Trucks (pounds/mile)

Scenario Year: **2018**

All model years in the range 1974 to 2018

Passenger Vehicles (pounds/mile)	Delivery Trucks (pounds/mile)

CO	0.00537891
NOx	0.00051297
ROG	0.00060109
SOx	0.00001079
PM10	0.00009446
PM2.5	0.00006192
CO2	1.10627489
CH4	0.00005300

CO	0.00998101
NOx	0.01070034
ROG	0.00150242
SOx	0.00002723
PM10	0.00043131
PM2.5	0.00034605
CO2	2.84005015
CH4	0.00006663

CO	0.00502881
NOx	0.00047300
ROG	0.00057178
SOx	0.00001071
PM10	0.00009494
PM2.5	0.00006234
CO2	1.10562643
CH4	0.00005003

CO	0.00923234
NOx	0.00979416
ROG	0.00139856
SOx	0.00002749
PM10	0.00040110
PM2.5	0.00031792
CO2	2.84646835
CH4	0.00006203

Scenario Year: **2019**

All model years in the range 1975 to 2019

Passenger Vehicles (pounds/mile)	
CO	0.00471820
NOx	0.00043716
ROG	0.00054654
SOx	0.00001072
PM10	0.00009523
PM2.5	0.00006259
CO2	1.10496100
CH4	0.00004743

Delivery Trucks (pounds/mile)	
CO	0.00857192
NOx	0.00900205
ROG	0.00130563
SOx	0.00002706
PM10	0.00037393
PM2.5	0.00029276
CO2	2.85060182
CH4	0.00005619

0.78293135

Scenario Year: **2020**

All model years in the range 1976 to 2020

Passenger Vehicles (pounds/mile)	
CO	0.00444247
NOx	0.00040506
ROG	0.00052463
SOx	0.00001073
PM10	0.00009550
PM2.5	0.00006279
CO2	1.10456157
CH4	0.00004495

Delivery Trucks (pounds/mile)	
CO	0.00799617
NOx	0.00831802
ROG	0.00122382
SOx	0.00002733
PM10	0.00035054
PM2.5	0.00027128
CO2	2.85148109
CH4	0.00005330

Scenario Year: **2021**

All model years in the range 1977 to 2021

Passenger Vehicles (pounds/mile)	
CO	0.00421218
NOx	0.00037757
ROG	0.00050573
SOx	0.00001073
PM10	0.00009640
PM2.5	0.00006364
CO2	1.11009559
CH4	0.00004322

Delivery Trucks (pounds/mile)	
CO	0.00748303
NOx	0.00773500
ROG	0.00115568
SOx	0.00002755
PM10	0.00033125
PM2.5	0.00025331
CO2	2.86434187
CH4	0.00004905

0.76470588

Scenario Year: **2022**

All model years in the range 1978 to 2022

Passenger Vehicles (pounds/mile)	
CO	0.00397866
NOx	0.00035150
ROG	0.00048658
SOx	0.00001072
PM10	0.00009661
PM2.5	0.00006389
CO2	1.11019931
CH4	0.00004121

Delivery Trucks (pounds/mile)	
CO	0.00699290
NOx	0.00722470
ROG	0.00108569
SOx	0.00002774
PM10	0.00031501
PM2.5	0.00023906
CO2	2.87006769
CH4	0.00004557

0.75890985

Highest (Most Conservative) EMFAC2007 (version 2.3)
Emission Factors for On-Road Passenger Vehicles & Delivery Trucks

Projects in the SCAQMD (Scenario Years 2007 - 2026)

Derived from Peak Emissions Inventory (**Winter**, **Annual**, **Summer**)

Vehicle Class:

Passenger Vehicles (<8500 pounds) & Delivery Trucks (>8500 pounds)

Scenario Year: **2023**

All model years in the range 1979 to 2023

Passenger Vehicles (pounds/mile)	
CO	0.00377527
NOx	0.00032851
ROG	0.00046900
SOx	0.00001070
PM10	0.00009676
PM2.5	0.00006405
CO2	1.11023373
CH4	0.00003951

Delivery Trucks (pounds/mile)	
CO	0.00658123
NOx	0.00679147
ROG	0.00102852
SOx	0.00002790
PM10	0.00030109
PM2.5	0.00022582
CO2	2.87466338
CH4	0.00004218

Scenario Year: **2024**

All model years in the range 1980 to 2024

Passenger Vehicles (pounds/mile)	
CO	0.00358611
NOx	0.00030721
ROG	0.00045136
SOx	0.00001080
PM10	0.00009676
PM2.5	0.00006410
CO2	1.11061572
CH4	0.00003781

Delivery Trucks (pounds/mile)	
CO	0.00625076
NOx	0.00647083
ROG	0.00096578
SOx	0.00002807
PM10	0.00029407
PM2.5	0.00021880
CO2	2.88010717
CH4	0.00004019

Scenario Year: **2025**

All model years in the range 1981 to 2025

Passenger Vehicles (pounds/mile)	
CO	0.00342738
NOx	0.00028846
ROG	0.00043545
SOx	0.00001070
PM10	0.00009679
PM2.5	0.00006418
CO2	1.11078571
CH4	0.00003641

Delivery Trucks (pounds/mile)	
CO	0.00595363
NOx	0.00615945
ROG	0.00092178
SOx	0.00002761
PM10	0.00028425
PM2.5	0.00020958
CO2	2.88143570
CH4	0.00003765

Scenario Year: **2026**

All model years in the range 1982 to 2026

Passenger Vehicles (pounds/mile)	
CO	0.00328779
NOx	0.00027141
ROG	0.00042052
SOx	0.00001076
PM10	0.00009687
PM2.5	0.00006415
CO2	1.11105829
CH4	0.00003518

Delivery Trucks (pounds/mile)	
CO	0.00569435
NOx	0.00589869
ROG	0.00088403
SOx	0.00002716
PM10	0.00027657
PM2.5	0.00020187
CO2	2.88298299
CH4	0.00003581

CalEEMod Table 3.3 OFFROAD Default Horsepower and Load Factors

OFFROAD Equipment Type	Horsepower	Load Factor
Aerial Lifts	63	0.31
Air Compressors	78	0.48
Bore/Drill Rigs	221	0.5
Cement and Mortar Mixers	9	0.56
Concrete/Industrial Saws	81	0.73
Cranes	231	0.29
Crawler Tractors	212	0.43
Crushing/Proc. Equipment	85	0.78
Dumpers/Tenders	16	0.38
Excavators	158	0.38
Forklifts	89	0.2
Generator Sets	84	0.74
Graders	187	0.41
Off-Highway Tractors	124	0.44
Off-Highway Trucks	402	0.38
Other Construction Equipment	172	0.42
Other General Industrial Equipment	88	0.34
Other Material Handling Equipment	168	0.4
Pavers	130	0.42
Paving Equipment	132	0.36
Plate Compactors	8	0.43
Pressure Washers	13	0.3
Pumps	84	0.74
Rollers	80	0.38

Rough Terrain Forklifts	100	0.4
Rubber Tired Dozers	247	0.4
Rubber Tired Loaders	203	0.36
Scrapers	367	0.48
Signal Boards	6	0.82
Skid Steer Loaders	65	0.37
Surfacing Equipment	263	0.3
Sweepers/Scrubbers	64	0.46
Tractors/Loaders/Backhoes	97	0.37
Trenchers	78	0.5
Welders	46	0.45

Table 3.5 OFFROAD Emission Factor Based on Engine Tier

Tier	Low HP	High HP	CO, g/bhp-hr	NOx, g/bhp-hr	PM10, g/bhp-hr	PM2.5, g/bhp-hr	ROG, g/bhp-hr
Tier 1	25	49	4.1	5.26	0.48	0.48	1.74
	50	74	6.9	6.54	0.552	0.552	1.19
	75	119	6.9	6.54	0.552	0.552	1.19
	120	174	6.9	6.54	0.274	0.274	0.82
	175	299	6.9	5.93	0.108	0.108	0.38
	300	599	6.9	5.93	0.108	0.108	0.38
	600	750	6.9	5.93	0.108	0.108	0.38
	751	2000	6.9	5.93	0.108	0.108	0.38
Tier 2	25	49	4.1	4.63	0.28	0.28	0.29
	50	74	3.7	4.75	0.192	0.192	0.23
	75	119	3.7	4.75	0.192	0.192	0.23
	120	174	3.7	4.17	0.128	0.128	0.19
	175	299	2.6	4.15	0.088	0.088	0.12
	300	599	2.6	3.79	0.088	0.088	0.12
	600	750	2.6	3.79	0.088	0.088	0.12
	751	2000	2.6	3.79	0.088	0.088	0.12
Tier 3	25	49	4.1	4.63	0.28	0.28	0.29
	50	74	3.7	2.74	0.192	0.192	0.12
	75	119	3.7	2.74	0.192	0.192	0.12
	120	174	3.7	2.32	0.112	0.112	0.12
	175	299	2.6	2.32	0.088	0.088	0.12
	300	599	2.6	2.32	0.088	0.088	0.12
	600	750	2.6	2.32	0.088	0.088	0.12
	751	2000	2.6	2.32	0.088	0.088	0.12

Tier 4 Interim	25	49	4.1	4.55	0.128	0.128	0.12
	50	74	3.7	2.74	0.112	0.112	0.12
	75	119	3.7	2.14	0.008	0.008	0.11
	120	174	3.7	2.15	0.008	0.008	0.06
	175	299	2.6	1.29	0.008	0.008	0.08
	300	599	2.6	1.29	0.008	0.008	0.08
	600	750	2.6	1.29	0.008	0.008	0.08
	751	2000	2.6	2.24	0.048	0.048	0.12
Tier 4 Final	25	49	4.1	2.75	0.008	0.008	0.12
	50	74	3.7	2.74	0.008	0.008	0.12
	75	119	3.7	0.26	0.008	0.008	0.06
	120	174	3.7	0.26	0.008	0.008	0.06
	175	299	2.2	0.26	0.008	0.008	0.06
	300	599	2.2	0.26	0.008	0.008	0.06
	600	750	2.2	0.26	0.008	0.008	0.06
	751	2000	2.6	2.24	0.016	0.016	0.06

Emission Factors Developed From AP42

https://www3.epa.gov/ttn/chief/ap42/ch13/index.html

Based upon dust emissions controls needed to meet SJVAPCD fugitive dust rules: 8011, 8021, 8031, 8041,8051, 8061 and 8071.

Paved Roads

page 13.2.1-4

E=k*((sL)^0.91)*((W)^1.02)

E	Emission Factor (lbs/VMT)
k	Particle size multiplier
sL	silt content (g/m^2)
W	Vehicle weight (tons)

k	0.00054	PM2.5
k	0.0022	PM10
sL	0.1	Assumed from AP42
W	3	Assumed worker vehicles and crew trucks
W	20	Assumed hauling trucks

E	0.000203731	PM2.5	Assumed worker vehicles and crew trucks
E	0.001410731	PM2.5	Assumed hauling trucks
E	0.000830016	PM10	Assumed worker vehicles and crew trucks
E	0.005747425	PM10	Assumed hauling trucks

Unpaved Roads

page 13.2.2-4

E=k*((s/12)^a)*((W/3)^b)

E	Emission Factor (lbs/VMT), uncontrolled
s	silt content (%)
W	Vehicle weight (tons)
k,a,b	Constants

s	4.3	Assumed based on statewide CalEEMod default assumptions	
W	3	Assumed worker vehicles and crew trucks	
W	20	Assumed hauling trucks	
a	0.9	PM2.5	Industrial roads
a	0.9	PM10	Industrial roads
b	0.45	PM2.5	Industrial roads
b	0.45	PM10	Industrial roads
k	0.15	PM2.5	Industrial roads
k	1.5	PM10	Industrial roads

E uncontrolled	0.059559322	PM2.5	Assumed worker vehicles and crew trucks
E uncontrolled	0.139864881	PM2.5	Assumed hauling trucks
E uncontrolled	0.595593223	PM10	Assumed worker vehicles and crew trucks
E uncontrolled	1.398648813	PM10	Assumed hauling trucks

SCAQMD control eff Table XI-A (assumed necessary to meet SJVAPCD dust control rules)

61%	Water active unpaved roads every 3 hrs
57%	Speed limit 15mph
0.3	Assumed control factor using frequent water and speed control

E controlled	0.017867797	PM2.5	Assumed worker vehicles and crew trucks

E controlled	0.041959464	PM2.5	Assumed hauling trucks
E controlled	0.178677967	PM10	Assumed worker vehicles and crew trucks
E controlled	0.419594644	PM10	Assumed hauling trucks

70% Assumed control eff for rocked areas including staging yards

E rocked	0.005360	PM2.5	Assumed worker vehicles and crew trucks
E rocked	0.012588	PM2.5	Assumed hauling trucks
E rocked	0.053603	PM10	Assumed worker vehicles and crew trucks
E rocked	0.125878	PM10	Assumed hauling trucks

80% Assumed control eff for water truck

E water truck	0.027972976	PM2.5	Assumed hauling trucks
E water truck	0.279729763	PM10	Assumed hauling trucks

General Construction Open Sources

Table 11.9-1 AP42

Truck Loading (lb/ton)

		lbs/ton	50%	Assume controlled with rule compliance
E=0.75*(1.16)/(M^1.2)	PM10	1.998735138	0.999367569	
E=0.019*(1.16)/(M^1.2)	PM2.5	0.050634623	0.025317312	
M=moisture content (%)	Assume 0.5%			

Bulldozing (lb/hr)

		lbs/hr	50%	Assume controlled with rule compliance
E=(0.75*(5.7*(s)^0.2)/(M^1.3)	PM10	14.09187573	7.045937863	
E=(0.105*(5.7*(s)^0.2)/(M^1.3)	PM2.5	1.972862602	0.986431301	
s=silt content (%)	Assume 4.3%			
M=moisture content (%)	Assume 0.5%			

Grading (lb/VMT) Assumed emission factor for backhoe work grading activities

			50%	Assume controlled with rule compliance
E=0.60*0.040*(S^2.5)	PM10	1.341640786	0.670820393	
E=0.031*0.040*(S^2.5)	PM2.5	0.069318107	0.034659054	
S=vehicle speed (mph)	Assume 5mph			

Table 11.9-4 AP42

Drilling (lb/hole) Assumed average of 1 hole/hr auger truck 50% Assume controlled with rule compliance

		lbs/hole		lbs/hr
E=1.3*0.75	PM10	0.975	0.4875	0.4875
E=1.3*0.105	PM2.5	0.1365	0.06825	0.06825

Disturbed Land Windblown dust

Windblown dust from disturbed land is expected to be minimal since the maintenance yard will be covered in rock.

Dust from the land disturbance activities calculated by specific machinery operations (grading, bulldozing, etc)

Helicopter Emssion Factor Calculation

1 All except SOx, PM2.5 and CO2 from Guidance on the Determination of Helicopter Emissions, Federal Department of the Environment, Transport, Energy and Communications, DETEC, Federal Office of Civil Aviation FOCA, Division Aviation Policy and Strategy, Swiss Confederation, March 2009. Downloaded from http://www.bazl.admin.ch/fachleute/01169/01174/01628/index.html?lang=en

2 PM2.5 emissions assumed equal to PM10

3 SOx emissions [lb/hr] = Fuel use [kg/hr] x 1000 [g/kg] / 453.6 [g/lb] x Fuel sulfur [wt. %] / 100 x 2 [lb SO2/lbS]
Fuel use = 98.8 kg/hr from Guidance on the Determination of Helicopter Emissions
Fuel sulfur = 0.3% from ASTM D-1655 for Jet-A

4 CO2 emissions [lb/hr] = CO2 emission factor [kg/gal] x 1000 [g/kg] / 453.6 [g/lb] x Fuel use [kg/hr] x 1000 [g/kg] / 453.6 [g/lb] / Fuel density [lb/gal]
CO2 emission factor = 9.75 kg/gal from Table 13.1 from California Climate Action Registry Default Emission Factors, April 2015.
Downloaded from http://www.theclimateregistry.org/wp-content/uploads/2015/04/2015-TCR-Default-EF-April-2015-FINAL.pdf
Fuel use = 98.8 kg/hr from Guidance on the Determination of Helicopter Emissions
Jet-A density = 6.8 lb/gal

5 CH4 ratio from CH4/ROG general construction equip

Equipment	Horse-power	ROG (lb/hr)[a]	CO (lb/hr)[a]	NOX (lb/hr)[a]	SOX (lb/hr)[a]	PM10 (lb/hr)[a]	PM2.5 (lb/hr)[b]	CO2 (lb/hr)[a]	CH4 (lb/hr)[a]
Hughes 500 E Helicopter	317	2.106	2.645	1.067	1.307	0.035	0.035	689	0.190
Hughes 501 Helicopter	420	1.766	2.194	1.422	1.482	0.044	0.044	781	0.215
MD 500N	450	1.704	2.118	1.537	1.548	0.047	0.047	816	0.224
Assumed Emission Factor	450	1.704	2.118	1.537	1.548	0.047	0.047	816	0.224

https://www.bazl.admin.ch/bazl/en/home/specialists/regulations-and-guidelines/environment/pollutant-emissions/aircraft-engine-emissions/guidance-on-the-determination-of-helicopter-emissions.html

Note: 420 hp has fuel usage of 112.3 kg/hr and 450 hp has 116.7
Note: All 3 helicopters appear to have similar engines: DDA250-C18, C20B and C20R

Table 3-3. Potential Staging Yards

Yard Name	Location	Condition	Approximate Area (Acres)	Project Component
Springville	Springville Substation	Disturbed	1-2 acres	Transmission and Distribution
Picnic Area	Approximately 0.5-mile southeast of Springville Substation	Disturbed	1-2 acres	Transmission and Distribution
West of Springville	Approximately 75 feet west of Springville Substation	Disturbed	2-3 acres	Transmission and Distribution
East of Springville	Approximately 0.2-mile east of Springville Substation	Disturbed	5 acres	Transmission and Distribution

From SCE

Table 3-5. Approximate Laydown/Work Area Dimensions

Laydown/Work Area Feature	Preferred Size (L x W) (Feet)
Transmission	
Guard Structures	150-foot x 50-foot
H-Frame Hybrid Structures	220-foot x 220-foot
Temporary Wood or Wood Equivalent Poles (Shoofly)	220-foot x 220-foot
Pull and Tension Area	450-foot x 150-foot
Splicing Area	200-foot x 150-foot
Distribution	
Pole Removal	50-foot x 100-foot
Remove and Replace Pole (Frame & Set New Poles)	50-foot x 100-foot
Conductor Stringing and Setup Area	50-foot x 100-foot
Underground Cable Removal	100-foot x 150-foot

Note: The dimensions listed above are preferred for construction efficiency; actual dimensions may vary depending on Project constraints.

From SCE

Table 3-6. Access/Spur Road Land Disturbance

Project Feature	Site Quantity	Disturbance Acreage Calculation (Length x Width)	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
Transmission Existing Access/Spur Road for Rehabilitation	1	- 33,343-foot x 14 foot	10.7	0	0
Transmission Drive and Crush Access road (Overland)	1	411-foot x 18-foot	0.2	0.2	0
Distribution Drive and Crush Access road (Overland)	1	2 linear miles x 10-foot	2.4	2.4	0
Total	--	--	13.3	2.6	0

From SCE

From "Table 3-7. Proposed Project Estimated Land Disturbance"

Project Feature	Quantity	Disturbance Acreage Calculation (Length x Width) (Feet)	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
Material and Equipment Staging Yard	4	Range of 1-5 acres (Maximum 12 acres)	12	12	0
Transmission					
Guard Structures	4	150-foot x 50-foot	0.7	0.7	0
Remove Existing Lattice Steel Tower[1]	15	220-foot x 220-foot	16.6	16.6	0
Construct New H-Frame Hybrid[2]	14	220-foot x 220-foot	15.5	14.1	1.4
Construct Shoofly[2]	36	220-foot x 150-foot	27.3	27.3	0
Conductor Stringing Setup Area[3]	4	450-foot x 150-foot	4.1	4.1	0
Conductor Stringing Setup Area for Shoofly[3]	4	450-foot x 150-foot	4.1	4.1	0
Conductor Splicing Setup Area[3]	2	200-foot x 150-foot	1.4	1.4	0
Conductor Splicing Setup Area for Shoofly[3]	2	200-foot x 150-foot	1.4	1.4	0

Existing Access/Spur Road Rehabilitation	1	- 33,343-foot x 14 foot	10.7	0	0
Drive and Crush Access/Spur Road	1	411-foot x 18-foot	0.2	0.2	0
Existing Tower Laydown/work area	7	150-foot x 150-foot	3.6	3.6	0
General Disturbance Area	1	Within existing SCE right-of-way	19.1	19.1	0
Subtotal Transmission			**104.7**	**92.6**	**1.4**
Distribution					
Complete Remove pole[5]	15	50-foot x 100-foot	1.7	1.7	0
Remove and Replace pole (Frame & Set New Poles)[6]	22	50-foot x 100-foot	2.5	2.5	0
Conductor Stringing Setup Area[6]	12	50-foot x 100-foot	1.4	1.4	0
Underground Cable Removal	1	100-foot x 150-foot	0.3	0.3	0
Overland Access Temporary Access Roads	2	Linear miles x 10-foot wide	2.4	2.4	0
Subtotal Distribution			**8.3**	**8.3**	**0**
Total Estimated Disturbance[4]	**-**	**-**	**113**	**100**	**1.4**

Notes:

[1] Includes the removal of existing conductor, teardown of existing structure, and removal of foundation 2 inches below ground surface.

[2] Includes structure assembly and erection, and conductor and OHGW installation. Area to be restored after construction. Portion of ROW within 20 feet of ALL structures to remain cleared of vegetation. Permanently disturbed area for H-Frames = 0.1 acre.

H-frame structure Base Volume and Area Calculations: H-frame 2 per structure, 25 feet deep, 6 feet diameter; earth removed for structure base = 52 cubic yards; surface area = 57 square feet; shoofly 1 per structure, 20 feet deep, 5 feet diameter; earth removed for structure base = 14.5 cubic yards; surface area = 13 square feet.

[3]Based on standard conductor reel lengths, conductor size, number of circuits, route design, and terrain.

[4] Includes the removal of existing structure & conductor.

[5] Includes framing & setting, conductor installation or transfer. Area to be restored after construction. Portion of R/W within 20' of ALL structures to remain cleared of vegetation. Permanently disturbed areas for Poles=0.05 acre.

Distribution structure Base Volume and Area Calculations: Average Pole depth 12-foot deep, 2.5-foot diameter, qty 1 per Pole. Earth removed for pole base = 2.2 cubic yards.; surface area = 4.9 square feet.

[6] Based on approximate length of overland in miles multiplied by drivable width of 10-foot road.

[7] The disturbed acreage calculations are estimates based upon SCE’s preferred area of use for the described Project feature, the width of the existing ROW, or the width of the proposed ROW, and they do not include any new access/spur road information; they are subject to revision based upon final engineering and review of the Project by SCE's Construction Manager and/or Contractor-awarded Project. The disturbance acreages identified do not account for overlapping disturbance areas within the Project features.

From SCE

From"Table 3-9. Construction Equipment Description"

Equipment Type	Use Description
1-Ton Truck, 4x4	Transports workers and material
Auger Truck	Light/medium-duty digs holes for poles
Backhoe/Front Loader	Medium-duty - grades soil, loads dirt into dump trucks
Boom/Crane Truck	Light/medium-duty - lifts/places material
Bull Wheel Puller	Provides tension on conductor/ground wire during stringing operation
Compressor Trailer	Provides compressed air for pneumatic tools
Concrete Mixer Truck	Delivers and mixes concrete for job site
Crane (L)	Heavy-duty - lifts/places material
D8	Site preparation grading
Drill Rig	Drilling foundations
Drum Type Compactor	Compacts soil
Dump Truck	Imports/exports material
Dump/Stake Bed Truck	Hauling material
Excavator	Excavates and/or moves native soil
Flatbed Pole Truck	Hauls poles
Flatbed Truck/Trailer	Hauls material
Generator	Provide temporary power if required
Helicopter Support Truck	Refueling helicopter and related support
Hughes 500E	Flying sock line, transports material and linemen
Lowboy Truck/Trailer	Hauls material
Manlift/Bucket Truck	Lifts and transports workers
Motor Grader	Medium-duty - grades terrain
Puller	Pulls conductor/ground wire during stringing operation
Rough-Terrain Forklift	Lifts and transports material in rough terrain

Sag Cat w/ winches	Conductor snubbing and sagging
Sock Line Puller	Pulls sock line during stringing operation
Splicing Rig	Conductor splicing
Static Truck/ Tensioner	Provides tension on conductor/ground wire during stringing operation
Track Type Dozer	Heavy-duty - grades terrain
Water Truck	Wets access/spur roads to mitigate fugitive dust/improve compaction
Wire Truck/Trailer	Hauls conductor/ground wire to job site, hold conductor/ground wire during stringing operation

From SCE

From "Table 3-10. Proposed Project Schedule"

Project Activity	Approximate Duration (Months)	Approximate Start Date
CPCN (Expedited)	6	Q1 2021
Final Engineering	8	Q4 2020
Property Acquisitions	12	Q1 2021
Acquisition of Required Permits	6	Q2 2020
Construction (Yards, Distribution, Transmission)	12 to 15	Q3 2021
Cleanup	2	Q3 2022
Project Operational	2	Q4 2022

From SCE

WORK ACTIVITY	Estimated Days	Work Fotce
Staging/Material Yard (1)	Duration	4
Transmission Survey (2)	5	4
Transmission Road & Structure Pad Work (3)	15	5
Transmission Guard Structure Installation (4)	2	6
Transmission Shoofly Pole Haul (5)	6	4
Transmission Shoofly Wood/Wood Equivalent Pole Assembly (6)	13	6
Transmission Shoofly Wood/Wood Equivalent Pole Installation (7)	18	6
Transmission Shoofly Conductor & GW Installation (8)	12	14
Transmission Remove Existing Conductor & GW (9)	14	14
Transmission LST Removal (10)	21	6
Transmission LST Foundation Removal (11)	12	4
Transmission Install H-Frame Hybrid Foundations (12)	38	6
Transmission H-Frame Hybrid Haul (13)	5	4
Transmission H-Frame Hybrid Assembly (14)	14	6
Transmission H-Frame Hybrid Erection (15)	14	8
Transmission Install Conductor & GW (16)	14	28
Transmission Shoofly Conductor/GW Removal (17)	11	14
Transmission Shoofly Pole Removal (18)	9	6
Transmission Guard Structure Removal (19)	1	6
Transmission Restoration (20)	6	7
Distribution Survey (21)	5	4

Distribution Remove Existing Conductor (22)	4	14
Distribution Pole Removal (23)	20	6
Distribution Pole Assembly and Set/Replacement (24)	10	4
Distribution Install or Transfer Conductor (25)	11	5
Distribution Restoration (26)	5	7

Total	285
Days/wk	5
Weeks	57
Months	14

Road Construction Emissions Model
Data Entry Worksheet

Version 9.0.0

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells D10 through D24, E28 through G35, and D38 through D41 for all project types.
Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new project.

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

Input Type

Project Name	Tule River, Phase 2 Spillway Raise based on 65% designs, with mitigation	
Construction Start Year	2021	Enter a Year between 2014 and 2040 (inclusive)
Project Type For 4: Other Linear Project Type, please provide project specific off-road equipment population and vehicle trip data	4	1) New Road Construction : Project to build a roadway from bare ground, which generally requires more site preparation than widening an existing roadway 2) Road Widening : Project to add a new lane to an existing roadway 3) Bridge/Overpass Construction : Project to build an elevated roadway, which generally requires some different equipment than a new roadway, such as a crane 4) Other Linear Project Type: Non-roadway project such as a pipeline, transmission line, or levee construction
Project Construction Time	18.00	months
Working Days per Month	22.00	days (assume 22 if unknown)
Predominant Soil/Site Type: Enter 1, 2, or 3 (for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise see instructions provided in cells J18 to J22)	1	1) Sand Gravel : Use for quaternary deposits (Delta/West County) 2) Weathered Rock-Earth : Use for Laguna formation (Jackson Highway area) or the Ione formation (Scott Road, Rancho Murieta) 3) Blasted Rock : Use for Salt Springs Slate or Copper Hill Volcanics (Folsom South of Highway 50, Rancho Murieta)
Project Length	3.50	miles
Total Project Area	50.00	acres
Maximum Area Disturbed/Day	6.00	acres
Water Trucks Used?	1	1. Yes 2. No

Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County.

http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalseries

Material Hauling Quantity Input

Material Type	Phase	Haul Truck Capacity (yd^3) (assume 20 if unknown)	Import Volume (yd^3/day)	Export Volume (yd^3/day)
Soil	Grubbing/Land Clearing	83.00		117.00
	Grading/Excavation	83.00	1571.00	2501.00
	Drainage/Utilities/Sub-Grade			
	Paving			
Asphalt	Grubbing/Land Clearing			
	Grading/Excavation	20.00	131.00	6.00
	Drainage/Utilities/Sub-Grade	20.00	1.00	
	Paving	20.00	427.00	

Mitigation Options

On-road Fleet Emissions Mitigation	2010 and Newer On-road Vehicles Fleet	Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer
Off-road Equipment Emissions Mitigation	Tier 4 Equipment	Select "20% NOx and 45% Exhaust PM reduction" option if the project will be required to use a lower emitting off-road construction fleet. The SMAQMD Construction Mitigation Calculator can be used to confirm compliance with this mitigation measure (http://www.airquality.org/Businesses/CEQA-Land-Use-Planning/Mitigation).
Will all off-road equipment be tier 4?	All Tier 4 Equipment	Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets CARB Tier 4 Standard

The remaining sections of this sheet contain areas that require modification when 'Other Project Type' is selected.

Note: The program's estimates of construction period phase length can be overridden in cells D50 through D53, and F50 through F53.

Construction Periods	User Override of Construction Months	Program Calculated Months	User Override of Phase Starting Date	Program Default Phase Starting Date
Grubbing/Land Clearing	0.30	1.80		1/1/2021
Grading/Excavation	6.70	7.20		1/11/2021
Drainage/Utilities/Sub-Grade	10.00	6.30		8/3/2021
Paving	1.00	2.70		6/4/2022
Totals (Months)	18			

Note: Soil Hauling emission default values can be overridden in cells D61 through D64, and F61 through F64.

Soil Hauling Emissions	User Override of	Program Estimate of	User Override of Truck	Default Values	Calculated
User Input	Miles/Round Trip	Miles/Round Trip	Round Trips/Day	Round Trips/Day	Daily VMT
Miles/round trip: Grubbing/Land Clearing	7.00			2	14.00
Miles/round trip: Grading/Excavation	7.00			50	350.00
Miles/round trip: Drainage/Utilities/Sub-Grade	0.00		0	0	0.00
Miles/round trip: Paving	0.00		0	0	0.00

2010+ Model Year Mitigation Option Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.04	0.42	3.06	0.11	0.05	0.02	1,779.29	0.00	0.28	1,862.69
Grading/Excavation (grams/mile)	0.04	0.42	3.06	0.11	0.05	0.02	1,779.29	0.00	0.28	1,862.69
Draining/Utilities/Sub-Grade (grams/mile)	0.04	0.42	3.07	0.11	0.05	0.02	1,763.72	0.00	0.28	1,846.38
Paving (grams/mile)	0.04	0.42	3.08	0.11	0.05	0.02	1,748.57	0.00	0.27	1,830.52
Grubbing/Land Clearing (grams/trip)	0.00	0.00	3.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	3.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	3.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	3.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.01	0.11	0.00	0.00	0.00	54.92	0.00	0.01	57.49
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.19
Pounds per day - Grading/Excavation	0.03	0.33	2.75	0.09	0.04	0.01	1,372.94	0.00	0.22	1,437.28
Tons per const. Period - Grading/Excavation	0.00	0.02	0.20	0.01	0.00	0.00	101.19	0.00	0.02	105.93
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.02	0.20	0.01	0.00	0.00	101.37	0.00	0.02	106.12

Note: Asphalt Hauling emission default values can be overridden in cells D91 through D94, and F91 through F94.

Asphalt Hauling Emissions	User Override of	Program Estimate of	User Override of Truck	Default Values	Calculated
User Input	Miles/Round Trip	Miles/Round Trip	Round Trips/Day	Round Trips/Day	Daily VMT
Miles/round trip: Grubbing/Land Clearing	0.00		0	0	0.00
Miles/round trip: Grading/Excavation	30.00			7	210.00
Miles/round trip: Drainage/Utilities/Sub-Grade	30.00			1	30.00
Miles/round trip: Paving	30.00			22	660.00

2010+ Model Year Mitigation Option Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.04	0.42	3.06	0.11	0.05	0.02	1,779.29	0.00	0.28	1,862.69
Grading/Excavation (grams/mile)	0.04	0.42	3.06	0.11	0.05	0.02	1,779.29	0.00	0.28	1,862.69
Draining/Utilities/Sub-Grade (grams/mile)	0.04	0.42	3.07	0.11	0.05	0.02	1,763.72	0.00	0.28	1,846.38
Paving (grams/mile)	0.04	0.42	3.08	0.11	0.05	0.02	1,748.57	0.00	0.27	1,830.52
Grubbing/Land Clearing (grams/trip)	0.00	0.00	3.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	3.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	3.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	3.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.02	0.20	1.47	0.05	0.02	0.01	823.76	0.00	0.13	862.37
Tons per const. Period - Grading/Excavation	0.00	0.01	0.11	0.00	0.00	0.00	60.71	0.00	0.01	63.56
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.03	0.21	0.01	0.00	0.00	116.65	0.00	0.02	122.12
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.02	0.00	0.00	0.00	12.83	0.00	0.00	13.43
Pounds per day - Paving	0.06	0.62	4.67	0.16	0.07	0.02	2,544.26	0.00	0.40	2,663.51
Tons per const. Period - Paving	0.00	0.01	0.05	0.00	0.00	0.00	27.99	0.00	0.00	29.30
Total tons per construction project	0.00	0.02	0.18	0.01	0.00	0.00	101.53	0.00	0.02	106.29

Note: Worker commute default values can be overridden in cells D121 through D126.

Worker Commute Emissions	User Override of Worker			
User Input	Commute Default Values	Default Values		
Miles/ one-way trip	20		Calculated	Calculated
One-way trips/day	2		Daily Trips	Daily VMT
No. of employees: Grubbing/Land Clearing	17		34	680.00
No. of employees: Grading/Excavation	44		88	1,760.00
No. of employees: Drainage/Utilities/Sub-Grade	20		40	800.00
No. of employees: Paving	10		20	400.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.02	1.10	0.10	0.05	0.02	0.00	339.80	0.00	0.01	342.28
Grading/Excavation (grams/mile)	0.02	1.10	0.10	0.05	0.02	0.00	339.80	0.00	0.01	342.28
Draining/Utilities/Sub-Grade (grams/mile)	0.02	1.05	0.09	0.05	0.02	0.00	334.18	0.00	0.01	336.54
Paving (grams/mile)	0.02	1.00	0.08	0.05	0.02	0.00	328.72	0.00	0.01	330.96
Grubbing/Land Clearing (grams/trip)	1.18	2.95	0.34	0.00	0.00	0.00	72.81	0.08	0.04	85.39
Grading/Excavation (grams/trip)	1.18	2.95	0.34	0.00	0.00	0.00	72.81	0.08	0.04	85.39
Draining/Utilities/Sub-Grade (grams/trip)	1.14	2.90	0.33	0.00	0.00	0.00	71.66	0.08	0.03	83.89
Paving (grams/trip)	1.11	2.85	0.32	0.00	0.00	0.00	70.54	0.08	0.03	82.43
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.12	1.87	0.17	0.07	0.03	0.01	514.86	0.01	0.01	519.53
Tons per const. Period - Grubbing/Land Clearing	0.00	0.01	0.00	0.00	0.00	0.00	1.70	0.00	0.00	1.71

Pounds per day - Grading/Excavation	0.31	4.85	0.44	0.18	0.08	0.01	1,332.58	0.03	0.04	1,344.66
Tons per const. Period - Grading/Excavation	0.02	0.36	0.03	0.01	0.01	0.00	98.21	0.00	0.00	99.10
Pounds per day - Drainage/Utilities/Sub-Grade	0.13	2.11	0.19	0.08	0.03	0.01	595.72	0.02	0.02	600.96
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.01	0.23	0.02	0.01	0.00	0.00	65.53	0.00	0.00	66.11
Pounds per day - Paving	0.06	1.01	0.09	0.04	0.02	0.00	292.99	0.01	0.01	295.49
Tons per const. Period - Paving	0.00	0.01	0.00	0.00	0.00	0.00	3.22	0.00	0.00	3.25
Total tons per construction project	0.04	0.61	0.05	0.02	0.01	0.00	168.66	0.00	0.00	170.17

Note: Water Truck default values can be overridden in cells D153 through D156, I153 through I156, and F153 through F156.

Water Truck Emissions	User Override of	Program Estimate of	User Override of Truck	Default Values	Calculated	User Override of	Default Values	Calculated
User Input	Default # Water Trucks	Number of Water Trucks	Round Trips/Vehicle/Day	Round Trips/Vehicle/Day	Trips/day	Miles/Round Trip	Miles/Round Trip	Daily VMT
Grubbing/Land Clearing - Exhaust	3		5.00			8.00		120.00
Grading/Excavation - Exhaust	3		5.00			8.00		120.00
Drainage/Utilities/Subgrade	2		5.00			8.00		80.00
Paving	2		5.00			8.00		80.00

2010+ Model Year Mitigation Option Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.04	0.42	3.06	0.11	0.05	0.02	1,779.29	0.00	0.28	1,862.69
Grading/Excavation (grams/mile)	0.04	0.42	3.06	0.11	0.05	0.02	1,779.29	0.00	0.28	1,862.69
Draining/Utilities/Sub-Grade (grams/mile)	0.04	0.42	3.07	0.11	0.05	0.02	1,763.72	0.00	0.28	1,846.38
Paving (grams/mile)	0.04	0.42	3.08	0.11	0.05	0.02	1,748.57	0.00	0.27	1,830.52
Grubbing/Land Clearing (grams/trip)	0.00	0.00	3.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	3.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	3.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	3.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.01	0.11	0.93	0.03	0.01	0.00	470.72	0.00	0.07	492.78
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	1.55	0.00	0.00	1.63
Pounds per day - Grading/Excavation	0.01	0.11	0.93	0.03	0.01	0.00	470.72	0.00	0.07	492.78
Tons per const. Period - Grading/Excavation	0.00	0.01	0.07	0.00	0.00	0.00	34.69	0.00	0.01	36.32
Pounds per day - Drainage/Utilities/Sub-Grade	0.01	0.07	0.62	0.02	0.01	0.00	311.07	0.00	0.05	325.65
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.01	0.07	0.00	0.00	0.00	34.22	0.00	0.01	35.82
Pounds per day - Paving	0.01	0.07	0.63	0.02	0.01	0.00	308.40	0.00	0.05	322.85
Tons per const. Period - Paving	0.00	0.00	0.01	0.00	0.00	0.00	3.39	0.00	0.00	3.55
Total tons per construction project	0.00	0.02	0.15	0.00	0.00	0.00	73.86	0.00	0.01	77.32

Note: Fugitive dust default values can be overridden in cells D183 through D185.

Fugitive Dust	User Override of Max Acreage Disturbed/Day	Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearing	4.00		40.00	0.13	8.32	0.03
Fugitive Dust - Grading/Excavation	4.00		40.00	2.95	8.32	0.61
Fugitive Dust - Drainage/Utilities/Subgrade	1.00		10.00	1.10	2.08	0.23

Values in cells D195 through D228, D246 through D279, D297 through D330, and D348 through D381 are required when 'Other Project Type' is selected.

Off-Road Equipment Emissions

Grubbing/Land Clearing	Default Number of Vehicles	Mitigation Option Override of	Default		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	*Program-estimate*	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00			Tier 4	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.00			Tier 4	Crawler Tractors	0.72	12.54	1.45	0.07	0.07	0.02	2,281.09	0.74	0.02	2,305.68
0.00			Tier 4	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.00			Tier 4	Excavators	0.48	11.75	0.95	0.05	0.04	0.02	1,500.58	0.49	0.01	1,516.76
0.00			Tier 4	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7.00			Tier 4	Signal Boards	0.18	3.64	3.23	0.18	0.17	0.00	345.20	0.04	0.00	346.95
0.00			Tier 4	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
				pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

			ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Grubbing/Land Clearing	pounds per day	1.38	27.94	5.63	0.30	0.28	0.04	4,126.86	1.26	0.04	4,169.39
	Grubbing/Land Clearing	tons per phase	0.00	0.09	0.02	0.00	0.00	0.00	13.62	0.00	0.00	13.76

Grading/Excavation	Default Number of Vehicles	Mitigation Option Override of	Default		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	*Program-estimate*	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00			Tier 4	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Tier 4	Cranes	0.35	6.14	0.71	0.04	0.03	0.01	1,117.48	0.36	0.01	1,129.52
3.00			Tier 4	Crawler Tractors	0.72	12.54	1.45	0.07	0.07	0.02	2,281.09	0.74	0.02	2,305.68
0.00			Tier 4	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00			Tier 4	Excavators	0.79	19.59	1.59	0.08	0.07	0.03	2,500.96	0.81	0.02	2,527.93
0.00			Tier 4	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.00			Tier 4	Graders	0.61	10.55	1.22	0.06	0.06	0.02	1,925.05	0.62	0.02	1,945.79
0.00			Tier 4	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.00			Tier 4	Rollers	0.32	7.94	0.64	0.03	0.03	0.01	1,016.36	0.33	0.01	1,027.31
0.00			Tier 4	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.00			Tier 4	Rubber Tired Loaders	0.58	10.05	1.16	0.06	0.05	0.02	1,815.68	0.59	0.02	1,835.29
4.00			Tier 4	Scrapers	1.86	32.31	3.73	0.19	0.17	0.06	5,871.65	1.90	0.05	5,934.95
7.00			Tier 4	Signal Boards	0.18	3.64	3.23	0.18	0.17	0.00	345.20	0.04	0.00	346.95
0.00			Tier 4	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.00			Tier 4	Tractors/Loaders/Backhoes	0.38	9.37	0.76	0.04	0.03	0.01	1,203.60	0.39	0.01	1,216.56
0.00			Tier 4	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
			pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day

0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation			pounds per day	5.80	112.14	14.48	0.74	0.69	0.19	18,077.07	5.77	0.16	18,269.98
	Grading/Excavation			tons per phase	0.43	8.26	1.07	0.05	0.05	0.01	1,332.28	0.43	0.01	1,346.50

Drainage/Utilities/Subgrade Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00			Tier 4	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.00			Tier 4	Air Compressors	0.30	7.33	0.59	0.03	0.03	0.01	1,125.79	0.08	0.01	1,130.20
0.00			Tier 4	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.00			Tier 4	Generator Sets	0.49	12.17	0.99	0.05	0.05	0.02	1,869.11	0.09	0.01	1,875.60
3.00			Tier 4	Graders	0.61	10.55	1.22	0.06	0.06	0.02	1,924.44	0.62	0.02	1,945.17
0.00			Tier 4	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.00			Tier 4	Plate Compactors	0.05	1.09	0.97	0.05	0.05	0.00	103.44	0.01	0.00	103.96
0.00			Tier 4	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.00			Tier 4	Pumps	0.49	12.17	0.99	0.05	0.05	0.02	1,869.11	0.10	0.01	1,875.76
0.00			Tier 4	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.00			Tier 4	Rough Terrain Forklifts	0.32	7.83	0.63	0.03	0.03	0.01	1,001.29	0.32	0.01	1,012.08
0.00			Tier 4	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.00			Tier 4	Scrapers	1.86	32.31	3.73	0.19	0.17	0.06	5,876.48	1.90	0.05	5,939.83
7.00			Tier 4	Signal Boards	0.18	3.64	3.23	0.18	0.17	0.00	345.20	0.04	0.00	346.95
0.00			Tier 4	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.00			Tier 4	Tractors/Loaders/Backhoes	0.38	9.37	0.76	0.04	0.03	0.01	1,204.29	0.39	0.01	1,217.25
0.00			Tier 4	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment Number of Vehicles	If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab	Equipment Tier		Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Drainage/Utilities/Sub-Grade			pounds per day	4.68	96.46	13.11	0.68	0.63	0.16	15,319.13	3.55	0.13	15,446.79
	Drainage/Utilities/Sub-Grade			tons per phase	0.52	10.61	1.44	0.08	0.07	0.02	1,685.10	0.39	0.01	1,699.15

Paving Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00			Tier 4	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.00			Tier 4	Pavers	0.43	10.69	0.87	0.04	0.04	0.01	1,365.77	0.44	0.01	1,380.50
3.00			Tier 4	Paving Equipment	0.38	9.30	0.75	0.04	0.03	0.01	1,183.41	0.38	0.01	1,196.18
0.00			Tier 4	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00			Tier 4	Rollers	0.40	9.92	0.80	0.04	0.04	0.01	1,270.52	0.41	0.01	1,284.21
0.00			Tier 4	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7.00			Tier 4	Signal Boards	0.18	3.64	3.23	0.18	0.17	0.00	345.20	0.04	0.00	346.95
0.00			Tier 4	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00			Tier 4	Sweepers/Scrubbers		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.00			Tier 4	Tractors/Loaders/Backhoes		0.38	9.37	0.76	0.04	0.03	0.01	1,204.96	0.39	0.01	1,217.92
0.00			Tier 4	Trenchers		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			Tier 4	Welders		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment	If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab					ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Number of Vehicles			Equipment Tier	Type		pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00			N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Paving			pounds per day		1.77	42.92	6.42	0.34	0.31	0.06	5,369.85	1.66	0.05	5,425.76
	Paving			tons per phase		0.02	0.47	0.07	0.00	0.00	0.00	59.07	0.02	0.00	59.68
Total Emissions all Phases (tons per construction period) =>						0.97	19.44	2.60	0.13	0.12	0.03	3,090.07	0.84	0.03	3,119.09

Equipment default values for horsepower and hours/day can be overridden in cells D403 through D436 and F403 through F436.

Equipment	User Override of Horsepower	Default Values Horsepower	User Override of Hours/day	Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		78		8
Bore/Drill Rigs		221		8
Cement and Mortar Mixers		9		8
Concrete/Industrial Saws		81		8
Cranes		231		8
Crawler Tractors		212		8
Crushing/Proc. Equipment		85		8
Excavators		158		8
Forklifts		89		8
Generator Sets		84		8
Graders		187		8
Off-Highway Tractors		124		8
Off-Highway Trucks		402		8
Other Construction Equipment		172		8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		168		8
Pavers		130		8
Paving Equipment		132		8
Plate Compactors		8		8
Pressure Washers		13		8
Pumps		84		8
Rollers		80		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		247		8
Rubber Tired Loaders		203		8
Scrapers		367		8
Signal Boards		6		8
Skid Steer Loaders		65		8
Surfacing Equipment		263		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		97		8
Trenchers		78		8
Welders		46		8

END OF DATA ENTRY SHEET

Road Construction Emissions Model, Version 9.0.0

Daily Emission Estimates for -> Tule River, Phase 2 Spillway Raise based on 65% designs, with mitiga

Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	1.51	29.94	6.84	40.41	0.41	40.00	8.64	0.32	8.32	0.05	5,167.36	1.27	0.13	5,239.19
Grading/Excavation	6.17	117.62	20.08	41.09	1.09	40.00	9.15	0.83	8.32	0.23	22,077.07	5.81	0.62	22,407.07
Drainage/Utilities/Sub-Grade	4.83	98.67	14.13	10.79	0.79	10.00	2.75	0.67	2.08	0.17	16,342.57	3.56	0.21	16,495.51
Paving	1.90	44.62	11.81	0.57	0.57	0.00	0.41	0.41	0.00	0.09	8,515.50	1.67	0.50	8,707.60
Maximum (pounds/day)	6.17	117.62	20.08	41.09	1.09	40.00	9.15	0.83	8.32	0.23	22,077.07	5.81	0.62	22,407.07
Total (tons/construction project)	1.01	20.11	3.19	4.36	0.18	4.18	1.01	0.14	0.87	0.04	3,535.48	0.84	0.08	3,578.98

Notes:

Project Start Year ->	2021
Project Length (months) ->	18
Total Project Area (acres) ->	50
Maximum Area Disturbed/Day (acres) ->	6
Water Truck Used? ->	Yes

	Total Material Imported/Exported Volume (yd^3/day)		Daily VMT (miles/day)			
Phase	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	117	0	14	0	680	120
Grading/Excavation	4,072	137	350	210	1,760	120
Drainage/Utilities/Sub-Grade	0	1	0	30	800	80
Paving	0	427	0	660	400	80

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> Tule River, Phase 2 Spillway Raise based on 65% designs, with mitiga

Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.00	0.10	0.02	0.13	0.00	0.13	0.03	0.00	0.03	0.00	17.05	0.00	0.00	15.68
Grading/Excavation	0.45	8.67	1.48	3.03	0.08	2.95	0.67	0.06	0.61	0.02	1,627.08	0.43	0.05	1,498.14
Drainage/Utilities/Sub-Grade	0.53	10.85	1.55	1.19	0.09	1.10	0.30	0.07	0.23	0.02	1,797.68	0.39	0.02	1,646.11
Paving	0.02	0.49	0.13	0.01	0.01	0.00	0.00	0.00	0.00	0.00	93.67	0.02	0.01	86.89
Maximum (tons/phase)	0.53	10.85	1.55	3.03	0.09	2.95	0.67	0.07	0.61	0.02	1797.68	0.43	0.05	1,646.11
Total (tons/construction project)	1.01	20.11	3.19	4.36	0.18	4.18	1.01	0.14	0.87	0.04	3535.48	0.84	0.08	3,246.83

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

Grubbing/Land Clearing

Equipment Type	Number of Vehicles	Tier	HP	Load Factor (%)	Hours Per Day	Emission Factor (g/bhp-hr) ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	Emission Factor Data Source

Grading/Excavation

Equipment Type	Number of Vehicles	Tier	HP	Load Factor (%)	Hours Per Day	Emission Factor (g/bhp-hr) ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	Emission Factor Data Source

Drainage/Utilities/Subgrade

Equipment Type	Number of Vehicles	Tier	HP	Load Factor (%)	Hours Per Day	Emission Factor (g/bhp-hr) ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	Emission Factor Data Source

Paving

Equipment Type	Number of Vehicles	Tier	HP	Load Factor (%)	Hours Per Day	Emission Factor (g/bhp-hr) ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	Emission Factor Data Source

Year	ROG	Weighted - Grubbing	Weighted - Grading	Weighted - Drainage	Weighted - Paving	CO	Weighted - Grubbing	Weighted - Grading	Weighted - Drainage	Weighted - Paving	NOx
2014	0.0704	-	-	-	-	2.5553	-	-	-	-	0.2855
2015	0.0597	-	-	-	-	2.2699	-	-	-	-	0.2490
2016	0.0491	-	-	-	-	1.9702	-	-	-	-	0.2095
2017	0.0405	-	-	-	-	1.7329	-	-	-	-	0.1791
2018	0.0335	-	-	-	-	1.5296	-	-	-	-	0.1530
2019	0.0279	-	-	-	-	1.3662	-	-	-	-	0.1307
2020	0.0236	-	-	-	-	1.2220	-	-	-	-	0.1123
2021	0.0204	0.0204	0.0204	0.0101	-	1.1018	1.1018	1.1018	0.5433	-	0.0968
2022	0.0178	-	-	0.0090	0.0178	1.0001	-	-	0.5069	1.0001	0.0838
2023	0.0154	-	-	-	-	0.9126	-	-	-	-	0.0726
2024	0.0134	-	-	-	-	0.8386	-	-	-	-	0.0632
2025	0.0117	-	-	-	-	0.7754	-	-	-	-	0.0554
2026	0.0103	-	-	-	-	0.7225	-	-	-	-	0.0491
2027	0.0091	-	-	-	-	0.6774	-	-	-	-	0.0437
2028	0.0081	-	-	-	-	0.6398	-	-	-	-	0.0393
2029	0.0072	-	-	-	-	0.6075	-	-	-	-	0.0355
2030	0.0065	-	-	-	-	0.5801	-	-	-	-	0.0324
2031	0.0059	-	-	-	-	0.5565	-	-	-	-	0.0297
2032	0.0053	-	-	-	-	0.5366	-	-	-	-	0.0275
2033	0.0048	-	-	-	-	0.5196	-	-	-	-	0.0257
2034	0.0044	-	-	-	-	0.5049	-	-	-	-	0.0242
2035	0.0041	-	-	-	-	0.4922	-	-	-	-	0.0229
2036	0.0037	-	-	-	-	0.4811	-	-	-	-	0.0219
2037	0.0035	-	-	-	-	0.4719	-	-	-	-	0.0211
2038	0.0033	-	-	-	-	0.4637	-	-	-	-	0.0203
2039	0.0030	-	-	-	-	0.4566	-	-	-	-	0.0197
2040	0.0029	-	-	-	-	0.4506	-	-	-	-	0.0191
2041	0.0027					0.4452					0.0187
2042	0.0026					0.4404					0.0183
2043	0.0025					0.4367					0.0180
2044	0.0024					0.4339					0.0178
2045	0.0023					0.4317					0.0177
2046	0.0023					0.4300					0.0176
2047	0.0023					0.4286					0.0175
2048	0.0023					0.4274					0.0174
2049	0.0022					0.4268					0.0174
2050	0.0022					0.4264					0.0174
Total		0.0204	0.0204	0.0191	0.0178		1.1018	1.1018	1.0503	1.0001	

Heavy-Heavy Duty Diesel Truck

Water Truck Commute Emissions (EMFAC2017 - web 1.0.2, T7 Single Unit Construction Truck)

Year	ROG	Weighted-Grubbing	Weighted - Grading	Weighted - Drainage	Weighted - Paving	CO	Weighted-Grubbing	Weighted - Grading	Weighted - Drainage	Weighted - Paving	NOx
2014	1.8521	-	-	-	-	4.0026	-	-	-	-	15.4709
2015	1.5946	-	-	-	-	3.4621	-	-	-	-	13.7491
2016	1.2921	-	-	-	-	2.8379	-	-	-	-	11.7429
2017	1.0636	-	-	-	-	2.3588	-	-	-	-	10.5229
2018	0.9069	-	-	-	-	2.0416	-	-	-	-	9.6970
2019	0.7863	-	-	-	-	1.7985	-	-	-	-	9.0623
2020	0.5270	-	-	-	-	1.2976	-	-	-	-	7.5546
2021	0.4260	0.4260	0.4260	0.2101	-	1.1373	1.1373	1.1373	0.5609	-	6.4922
2022	0.1785	-	-	0.0905	0.1785	0.6644	-	-	0.3368	0.6644	4.7102
2023	0.0441	-	-	-	-	0.4262	-	-	-	-	3.5373
2024	0.0423	-	-	-	-	0.4266	-	-	-	-	3.4943
2025	0.0406	-	-	-	-	0.4273	-	-	-	-	3.4600
2026	0.0391	-	-	-	-	0.4279	-	-	-	-	3.4290
2027	0.0378	-	-	-	-	0.4281	-	-	-	-	3.4003
2028	0.0367	-	-	-	-	0.4288	-	-	-	-	3.3809
2029	0.0359	-	-	-	-	0.4297	-	-	-	-	3.3699
2030	0.0351	-	-	-	-	0.4306	-	-	-	-	3.3633
2031	0.0345	-	-	-	-	0.4315	-	-	-	-	3.3580
2032	0.0339	-	-	-	-	0.4322	-	-	-	-	3.3517
2033	0.0334	-	-	-	-	0.4325	-	-	-	-	3.3446
2034	0.0330	-	-	-	-	0.4325	-	-	-	-	3.3345
2035	0.0326	-	-	-	-	0.4321	-	-	-	-	3.3228
2036	0.0323	-	-	-	-	0.4320	-	-	-	-	3.3141
2037	0.0321	-	-	-	-	0.4317	-	-	-	-	3.3050
2038	0.0319	-	-	-	-	0.4314	-	-	-	-	3.2967
2039	0.0317	-	-	-	-	0.4312	-	-	-	-	3.2899
2040	0.0315	-	-	-	-	0.4308	-	-	-	-	3.2821
2041	0.0314					0.4305					3.2754
2042	0.0313					0.4302					3.2703
2043	0.0312					0.4300					3.2653
2044	0.0311					0.4298					3.2610
2045	0.0310					0.4296					3.2578
2046	0.0309					0.4295					3.2551
2047	0.0309					0.4294					3.2533
2048	0.0309					0.4293					3.2519
2049	0.0309					0.4292					3.2510
2050	0.0308					0.4292					3.2504

Total		0.4260	0.4260	0.3006	0.1785		1.1373	1.1373	0.8976	0.6644	

Year	ROG	Weighted - Grubbing	Weighted - Grading	Weighted - Drainage	Weighted - Paving	CO	Weighted - Grubbing	Weighted - Grading	Weighted - Drainage	Weighted - Paving	NOx
2014	0.0055	-	-	-	-	0.5214	-	-	-	-	0.0236
2015	0.0055	-	-	-	-	0.5173	-	-	-	-	0.0237
2016	0.0055	-	-	-	-	0.5163	-	-	-	-	0.0238
2017	0.0056	-	-	-	-	0.5153	-	-	-	-	0.0239
2018	0.0056	-	-	-	-	0.5147	-	-	-	-	0.0239
2019	0.0055	-	-	-	-	0.5170	-	-	-	-	0.0236
2020	0.0054	-	-	-	-	0.5158	-	-	-	-	0.0232
2021	0.0052	0.0052	0.0052	0.0026	-	0.5136	0.5136	0.5136	0.2533	-	0.0226
2022	0.0051	-	-	0.0026	0.0051	0.5106	-	-	0.2588	0.5106	0.0220
2023	0.0049	-	-	-	-	0.5066	-	-	-	-	0.0213
2024	0.0047	-	-	-	-	0.5012	-	-	-	-	0.0205
2025	0.0044	-	-	-	-	0.4942	-	-	-	-	0.0199
2026	0.0042	-	-	-	-	0.4875	-	-	-	-	0.0193
2027	0.0040	-	-	-	-	0.4813	-	-	-	-	0.0188
2028	0.0038	-	-	-	-	0.4755	-	-	-	-	0.0184
2029	0.0036	-	-	-	-	0.4701	-	-	-	-	0.0181
2030	0.0035	-	-	-	-	0.4650	-	-	-	-	0.0178
2031	0.0033	-	-	-	-	0.4603	-	-	-	-	0.0175
2032	0.0032	-	-	-	-	0.4560	-	-	-	-	0.0174
2033	0.0030	-	-	-	-	0.4521	-	-	-	-	0.0172
2034	0.0029	-	-	-	-	0.4485	-	-	-	-	0.0171
2035	0.0028	-	-	-	-	0.4452	-	-	-	-	0.0171
2036	0.0027	-	-	-	-	0.4423	-	-	-	-	0.0170
2037	0.0026	-	-	-	-	0.4397	-	-	-	-	0.0170
2038	0.0026	-	-	-	-	0.4375	-	-	-	-	0.0171
2039	0.0025	-	-	-	-	0.4355	-	-	-	-	0.0171
2040	0.0024	-	-	-	-	0.4338	-	-	-	-	0.0171
2041	0.0024					0.4323					0.0171
2042	0.0024					0.4310					0.0172
2043	0.0023					0.4300					0.0172
2044	0.0023					0.4291					0.0173
2045	0.0023					0.4283					0.0173
2046	0.0023					0.4277					0.0173
2047	0.0023					0.4272					0.0174
2048	0.0022					0.4268					0.0174
2049	0.0022					0.4265					0.0174
2050	0.0022					0.4262					0.0174
Total		0.0052	0.0052	0.0052	0.0051		0.5136	0.5136	0.5120	0.5106	

Heavy-Heavy Duty Diesel Truck

Water Truck Commute Emissions (EMFAC2017 - web 1.0.2, T7 Single Unit Construction Truck)

Year	ROG	Weighted-Grubbing	Weighted - Grading	Weighted - Drainage	Weighted - Paving	CO	Weighted-Grubbing	Weighted - Grading	Weighted - Drainage	Weighted - Paving	NOx
2014	0.0583	-	-	-	-	0.4129	-	-	-	-	2.9101
2015	0.0529	-	-	-	-	0.4082	-	-	-	-	2.8491
2016	0.0508	-	-	-	-	0.4094	-	-	-	-	2.8549
2017	0.0476	-	-	-	-	0.4102	-	-	-	-	2.8769
2018	0.0457	-	-	-	-	0.4130	-	-	-	-	2.9175
2019	0.0444	-	-	-	-	0.4157	-	-	-	-	2.9546
2020	0.0425	-	-	-	-	0.4199	-	-	-	-	3.0272
2021	0.0418	0.0418	0.0418	0.0206	-	0.4228	0.4228	0.4228	0.2085	-	3.0635
2022	0.0402	-	-	0.0204	0.0402	0.4233	-	-	0.2145	0.4233	3.0792
2023	0.0291	-	-	-	-	0.4046	-	-	-	-	2.9826
2024	0.0294	-	-	-	-	0.4082	-	-	-	-	3.0228
2025	0.0296	-	-	-	-	0.4118	-	-	-	-	3.0634
2026	0.0298	-	-	-	-	0.4149	-	-	-	-	3.0980
2027	0.0300	-	-	-	-	0.4172	-	-	-	-	3.1232
2028	0.0302	-	-	-	-	0.4197	-	-	-	-	3.1503
2029	0.0303	-	-	-	-	0.4221	-	-	-	-	3.1777
2030	0.0305	-	-	-	-	0.4243	-	-	-	-	3.2028
2031	0.0306	-	-	-	-	0.4263	-	-	-	-	3.2255
2032	0.0307	-	-	-	-	0.4279	-	-	-	-	3.2430
2033	0.0308	-	-	-	-	0.4291	-	-	-	-	3.2559
2034	0.0309	-	-	-	-	0.4297	-	-	-	-	3.2619
2035	0.0309	-	-	-	-	0.4299	-	-	-	-	3.2635
2036	0.0309	-	-	-	-	0.4301	-	-	-	-	3.2652
2037	0.0309	-	-	-	-	0.4302	-	-	-	-	3.2648
2038	0.0309	-	-	-	-	0.4301	-	-	-	-	3.2639
2039	0.0309	-	-	-	-	0.4301	-	-	-	-	3.2635
2040	0.0309	-	-	-	-	0.4300	-	-	-	-	3.2612
2041	0.0309					0.4298					3.2588
2042	0.0309					0.4297					3.2571
2043	0.0308					0.4295					3.2551
2044	0.0308					0.4294					3.2535
2045	0.0308					0.4294					3.2526
2046	0.0308					0.4293					3.2514
2047	0.0308					0.4292					3.2507
2048	0.0308					0.4292					3.2500
2049	0.0308					0.4291					3.2496
2050	0.0308					0.4291					3.2496

Total		0.0418	0.0418	0.0410	0.0402		0.4228	0.4228	0.4230	0.4233	

	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
5	Emissions (g/bhp-hr)		ROG	ROG	ROG	ROG		CO	CO	CO	CO		NOx	NOx	NOx	NOx		PM10	PM10	PM10	PM10
6	Aerial Lifts		Weighted - Grubbing	Weighted - Grading	Weighted - Drainage	Weighted - Paving		Weighted - Grubbing	Weighted - Grading	Weighted - Drainage	Weighted - Paving		Weighted - Grubbing	Weighted - Grading	Weighted - Drainage	Weighted - Paving		Weighted - Grubbing	Weighted - Grading	Weighted - Drainage	Weighted - Paving
7		ROG					CO					NOx					PM10				
8	2014	0.2023	-	-	-	-	3.2195	-	-	-	-	3.3728	-	-	-	-	0.1608	-	-	-	-
9	2015	0.1906	-	-	-	-	3.2178	-	-	-	-	3.1134	-	-	-	-	0.1431	-	-	-	-
10	2016	0.1655	-	-	-	-	3.2010	-	-	-	-	2.7222	-	-	-	-	0.1119	-	-	-	-
11	2017	0.1427	-	-	-	-	3.1843	-	-	-	-	2.3637	-	-	-	-	0.0834	-	-	-	-
12	2018	0.1219	-	-	-	-	3.1669	-	-	-	-	2.0636	-	-	-	-	0.0571	-	-	-	-
13	2019	0.1182	-	-	-	-	3.1725	-	-	-	-	1.9766	-	-	-	-	0.0485	-	-	-	-
14	2020	0.1149	-	-	-	-	3.1768	-	-	-	-	1.8686	-	-	-	-	0.0416	-	-	-	-
15	2021	0.1088	0.1088	0.1088	0.0537	-	3.1762	3.1762	3.1762	1.5664	-	1.7437	1.7437	1.7437	0.8599	-	0.0333	0.0333	0.0333	0.0164	-
16	2022	0.1047	-	-	0.0531	0.1047	3.1760	-	-	1.6098	3.1760	1.6266	-	-	0.8244	1.6266	0.0302	-	-	0.0153	0.0302
17	2023	0.1005	-	-	-	-	3.1703	-	-	-	-	1.5481	-	-	-	-	0.0267	-	-	-	-
18	2024	0.1005	-	-	-	-	3.1726	-	-	-	-	1.5279	-	-	-	-	0.0265	-	-	-	-
19	2025	0.0988	-	-	-	-	3.1674	-	-	-	-	1.5108	-	-	-	-	0.0259	-	-	-	-
20	2026	0.0988	-	-	-	-	3.1674	-	-	-	-	1.5108	-	-	-	-	0.0259	-	-	-	-
21	2027	0.0988	-	-	-	-	3.1674	-	-	-	-	1.5108	-	-	-	-	0.0259	-	-	-	-
22	2028	0.0988	-	-	-	-	3.1674	-	-	-	-	1.5108	-	-	-	-	0.0259	-	-	-	-
23	2029	0.0988	-	-	-	-	3.1674	-	-	-	-	1.5108	-	-	-	-	0.0259	-	-	-	-
24	2030	0.1880	-	-	-	-	3.3520	-	-	-	-	1.6570	-	-	-	-	0.0360	-	-	-	-
25	2031	0.1880	-	-	-	-	3.3520	-	-	-	-	1.6570	-	-	-	-	0.0360	-	-	-	-
26	2032	0.1880	-	-	-	-	3.3520	-	-	-	-	1.6570	-	-	-	-	0.0360	-	-	-	-
27	2033	0.1880	-	-	-	-	3.3520	-	-	-	-	1.6570	-	-	-	-	0.0360	-	-	-	-
28	2034	0.1880	-	-	-	-	3.3520	-	-	-	-	1.6570	-	-	-	-	0.0360	-	-	-	-
29	2035	0.1660	-	-	-	-	3.3450	-	-	-	-	1.4660	-	-	-	-	0.0170	-	-	-	-
30	2036	0.1660	-	-	-	-	3.3450	-	-	-	-	1.4660	-	-	-	-	0.0170	-	-	-	-
31	2037	0.1660	-	-	-	-	3.3450	-	-	-	-	1.4660	-	-	-	-	0.0170	-	-	-	-
32	2038	0.1660	-	-	-	-	3.3450	-	-	-	-	1.4660	-	-	-	-	0.0170	-	-	-	-
33	2039	0.1660	-	-	-	-	3.3450	-	-	-	-	1.4660	-	-	-	-	0.0170	-	-	-	-
34	2040	0.1610	-	-	-	-	3.3440	-	-	-	-	1.4070	-	-	-	-	0.0120	-	-	-	-
35	Aerial Lifts Total		0.1088	0.1088	0.1067	0.1047		3.1762	3.1762	3.1761	3.1760		1.7437	1.7437	1.6843	1.6266		0.0333	0.0333	0.0317	0.0302

Off-road Equipment Tier 4 Emission Factors

HP Bin		Emission Factor (g/bhp-hr)				
Low HP	High HP	ROG	CO	NOx	PM10	PM2.5
0	11	0.30	6.00	5.32	0.30	0.28
11	25	0.30	4.90	5.32	0.30	0.28
25	50	0.19	4.10	3.33	0.02	0.02
50	75	0.19	3.70	3.33	0.02	0.02
75	100	0.15	3.70	0.30	0.02	0.01
100	175	0.15	3.70	0.30	0.02	0.01
175	300	0.15	2.60	0.30	0.02	0.01
300	600	0.15	2.60	0.30	0.02	0.01
600	750	0.15	2.60	0.30	0.02	0.01
750	1200	0.15	2.60	2.60	0.03	0.03
1200	9999	0.15	2.60	2.60	0.03	0.03

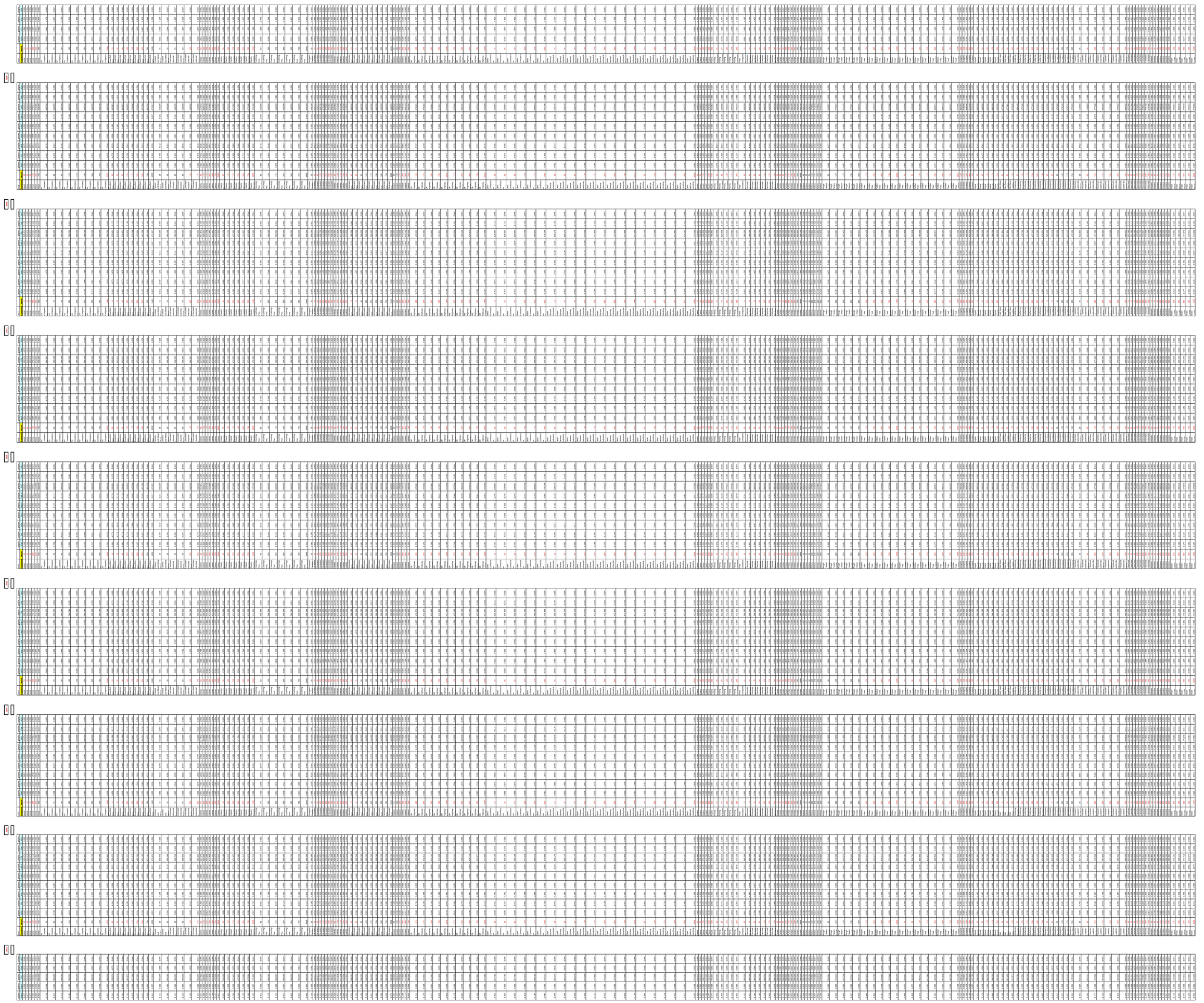
92 % of PM2.5 in PM10 (from CEIDARS)
95 % of NOx in NMHC+NOx (from http://www.arb.ca.gov/msprog/moyer/guidelines/2005_Carl_Moyer_Guidelines_Part4.pdf)
1.07 VOC/NMHC

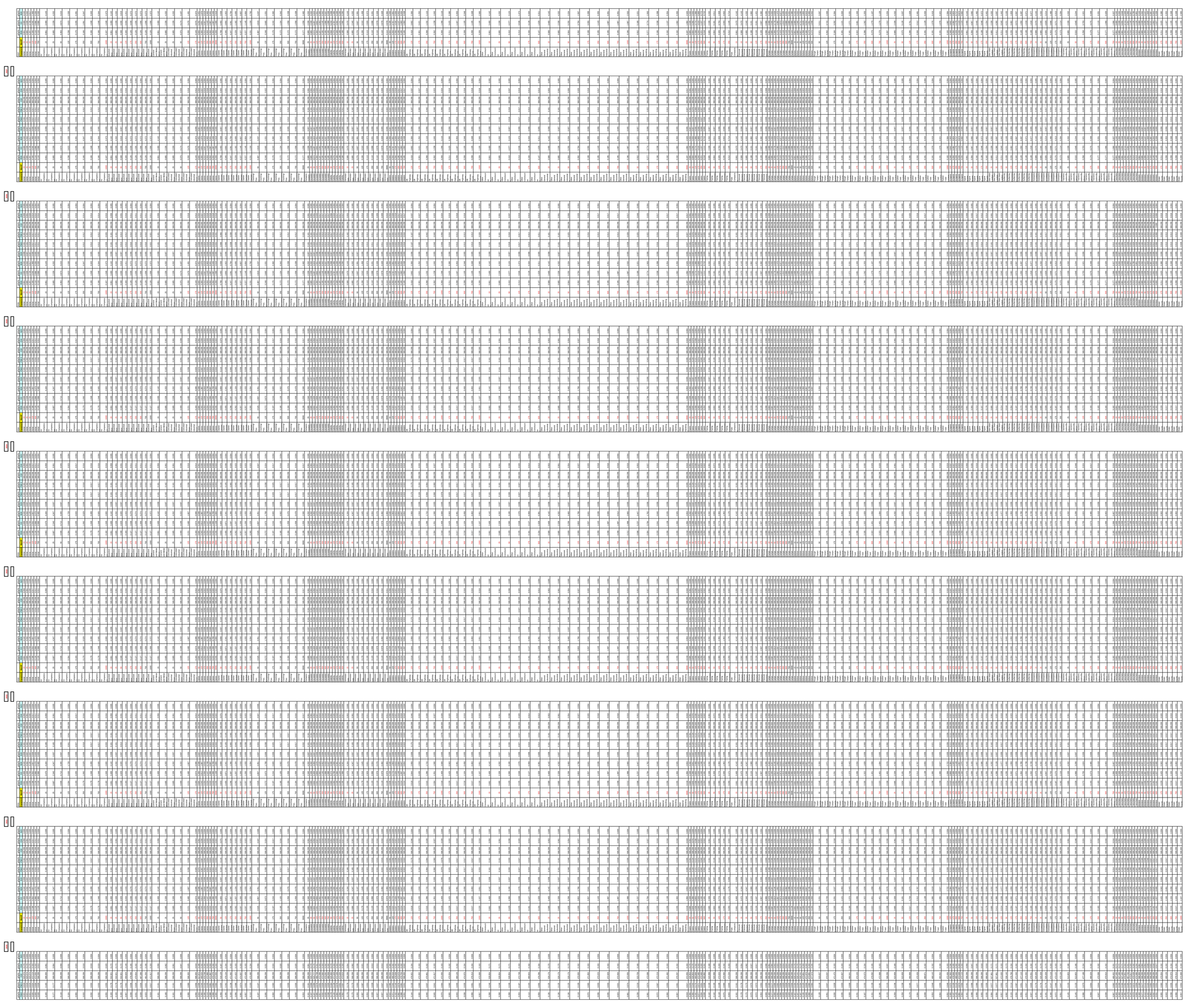
Note:
1. Tier 4 Emission Factors are converted from EPA Non-road Diesel Engine Standards. Available at www.arb.ca.gov/msprog/ordiesel/documents/Off-Road_Diesel_Stds.xls
2. Assume PM2.5 is 92% of PM10.

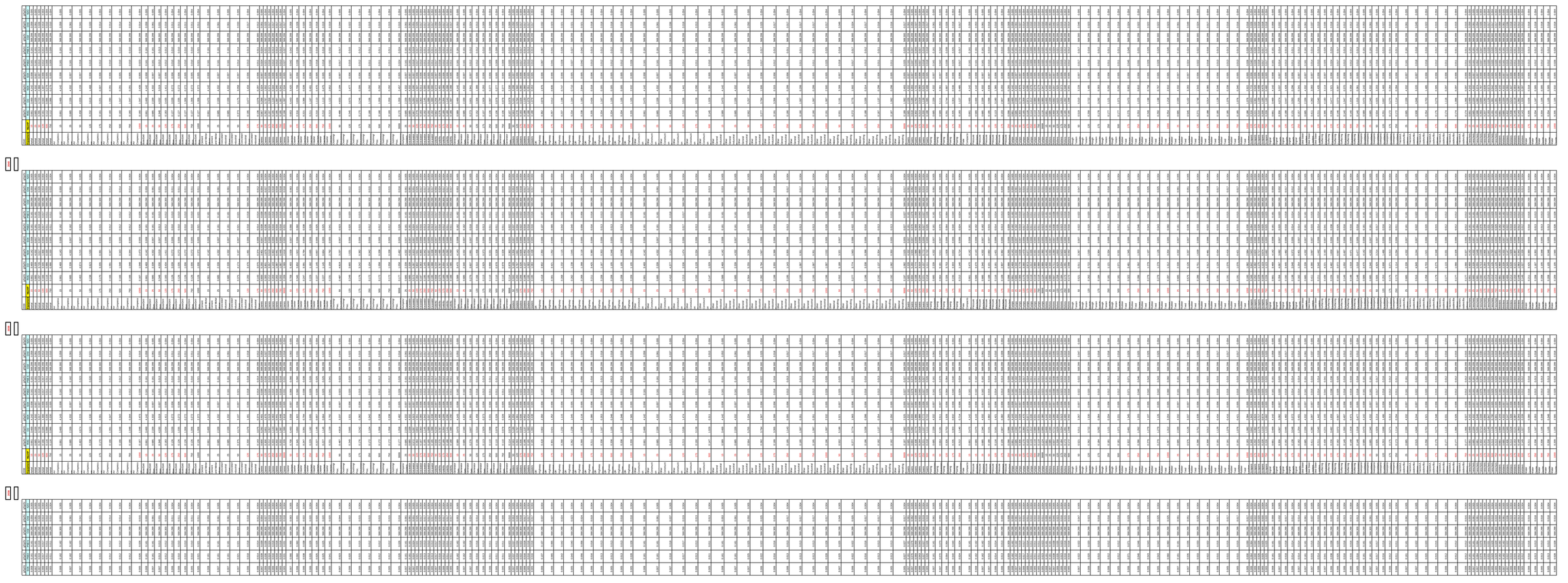
Default Horsepower and Load Factor

OFFROAD Equipment Type	Horsepower	Load Factor
Aerial Lifts	63	0.31
Air Compressors	78	0.48
Bore/Drill Rigs	221	0.5
Cement and Mortar Mixers	9	0.56
Concrete/Industrial Saws	81	0.73
Cranes	231	0.29
Crawler Tractors	212	0.43
Crushing/Proc. Equipment	85	0.78
Excavators	158	0.38
Forklifts	89	0.2
Generator Sets	84	0.74
Graders	187	0.41
Off-Highway Tractors	124	0.44
Off-Highway Trucks	402	0.38
Other Construction Equipment	172	0.42
Other General Industrial Equipment	88	0.34
Other Material Handling Equipment	168	0.4
Pavers	130	0.42
Paving Equipment	132	0.36
Plate Compactors	8	0.43
Pressure Washers	13	0.3
Pumps	84	0.74
Rollers	80	0.38
Rough Terrain Forklifts	100	0.4
Rubber Tired Dozers	247	0.4
Rubber Tired Loaders	203	0.36
Scrapers	367	0.48
Signal Boards	6	0.82
Skid Steer Loaders	65	0.37
Surfacing Equipment	263	0.3
Sweepers/Scrubbers	64	0.46
Tractors/Loaders/Backhoes	97	0.37
Trenchers	78	0.5
Welders	46	0.45

Default Horsepower and Load Factor from CalEEMod2016 Appendix D: Table 3.3







Basic Conversions	Factor	Value	Units	Source
	1 pound equals	453.592	grams	
	1 MT equals	1.102	tons	
	Total # of days in a week	7	days	
	1 kg equals	1,000	grams	
	1 Year equals	365	days	
	1 ton equals	2,000	pounds	
	Global Warming Potential of CH4	25	N/A	http://www.arb.ca.gov/cc/inventory/background/gwp.htm
	Global Warming Potential of N2O	298	N/A	http://www.arb.ca.gov/cc/inventory/background/gwp.htm

Appendix B

Biological Evaluation Report

U.S. Army Corps of Engineers, Sacramento District

STAFF ACTION SUMMARY SHEET

The proponent agency is CESPK-DE.

1. Initiation Date	2. Suspense Date
2019-12-04	2019-12-18

CLASSIFICATION: UNCLASSIFIED

1. Action To Be Taken: ☐ Information ☐ Decision/Approval ☒ Other Signature

2. Executive Tasker:

3. Subject
Tule River Spillway Enlargement Project Biological Assessment and USFWS re-initiation letter need review and signature

4. Final Approval Needed From: ☐ DDC ☐ DPM ☐ DE

5. Purpose
Tule River Spillway Enlargement Project Biological Assessment and USFWS re-initiation letter need review and signature

6. Background/Discussion
Re-initiation is being pursued for two reasons:. (1) There are modifications to the proposed action since the original consultation in 1999. The road relocation and spillway widening to accommodate the ogee weir design were not covered in detail in the Tule River Basin Investigation Final Environmental Impact Statement/Report and (2) there are changes regarding listed species referenced in the 1999 BO.

7. Coordination

Office Symbol	Name	Date In	Date Out	Initials	Executive Office Correspondence
SPK-OC	Lisa Clay	12/11	12/18		
SPK-PM-C	Anu Acharya	12/9/2019	12/9/2019	AA	

Position	Name	Date In	Date Out	Initials	Position	Name	Date In	Date Out	Initials
Action Officer (AO)	Yari Johnson	2019-12-06	2019-12-06		Executive Secretary				
AO Division Secretary	Nadine Arabia		12/11		Executive Assistant				
AO Section Chief	Dan Artho		12/11/19		Deputy Commander				
AO Branch Chief	Mark Ziminske	12/18	12/19		DPM				
AO Division Chief					Commander				

8. POC For Pick Up

Name	Phone Number
Yari Johnson	916-557-6937

QUALITY CONTROL CERTIFICATE

Environmental Resources Branch, Planning Division

PROJECT NAME: TULE RIVER SPILLWAY ENLARGEMENT PROJECT SUPPLEMENTAL BIOLOGICAL ASSESSMENT FOR THE ROAD RELOCATION AND RIGHT ABUTMENT SPILLWAY CUT, TULARE COUNTY, CA
PRODUCT: BIOLOGICAL ASSESSMENT
Actual Completion Date: Click here to enter a date.
PROJECT MANAGER: ANU ACHARYA

The analysis noted below describes in a clear and concise manner the major assumptions, methods, data, and analytical tools used in the analysis, and summarizes the results of the analysis using table and text formats. This DQC effort has verified that the plan formulation is compliant with clearly established U.S. Army Corps of Engineers policies, principles and procedures; that the assumptions, methods, data and analytical tools used are appropriate for purposes of the analysis; that the level of detail and scope of the analysis are appropriate for purposes of a Senior Leadership Briefing; and that the results are reasonable and consistent within the context of a determination of categorical exclusion.

Document reviewed: Tule River Spillway Enlargement Project Supplemental Biological Assessment....

ENVIRONMENTAL LEAD

I have ensured that the above products were prepared in accordance with standard quality control practices. I have also incorporated or resolved all issues identified during District Quality Control (DQC) review.

Environmental Lead: Yari Johnson — Title: Biological Sciences Environmental Manager

Yari Johnson		11/20/2019
Print name	Signature	Date

REVIEWER

I have reviewed the products noted above and find them to be in accordance with project requirements, standards of the profession, and USACE policies and standards.

DQC Reviewer: Mariah Brumbaugh — Title: Senior Environmental Manager, Environmental Planning

Mariah Brumbaugh		11/20/2019
Print name	Signature	Date

SUPERVISORY REVIEWER

I have reviewed the quality control process and ensured that comments have been adequately addressed, documented and resolved.

Section Chief: Dan Artho — Title: Chief, Environmental Planning Section

Dan Artho		12/11/19
Print name	Signature	Date

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO CA 95814-2922

Environmental Resources Branch

DEC 19 2019

Ms. Jennifer M. Norris
Field Supervisor
U.S. Fish and Wildlife Service
2800 Cottage Way, Suite W2605
Sacramento, California 95825-1846

Dear Ms. Norris:

The U.S. Army Corps of Engineers, Sacramento District (Corps) is requesting reinitiation of consultation under Section 7 of the Federal Endangered Species Act (50 CFR 402; 16 U.S.C. 1536 (c)) to evaluate, on a biological assessment (BA) level, potential effects associated with design changes to the proposed Tule River Spillway Enlargement Project at Lake Success in Tulare County, California. A Biological Opinion (BO) for this project was issued December 17, 1999, entitled "Formal Section 7 Consultation on the Proposed Permanent 10-foot Dam Elevation Increase at Lake Success in Tulare County, California" (1-1-99-F-0085). The enclosed revised BA includes additional information your staff requested from our July 15, 2019, reinitiation request.

Reinitiation is being pursued for two reasons: (1) There are modifications to the proposed action since the original consultation in 1999. The road relocation and spillway widening to accommodate the ogee weir design were not covered in detail in the Tule River Basin Investigation Final Environmental Impact Statement/Report and accompanying Biological Data Report due to insufficient information on the future location of the road and hydraulics of the spillway. (2) There are changes regarding listed species referenced in the 1999 BO. The U.S. Fish and Wildlife Service (USFWS) removed the Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*) from protected status in Tulare County since the species range ends more than 85 miles to the north. The USFWS delisted the Bald Eagle (*Haliaeetus leucocephalus*) on August 8, 2007. The Giant Garter Snake (*Thamnophis gigas*) is no longer found downstream from Lake Success along the Tule River, or anywhere else in Tulare County. Thus, these three species will not be evaluated in this BA. Least Bell's vireo (*Vireo bellii pusillus*) was not covered in the 1999 BO since the species was not known to occur at Lake Success. Corps bird surveys conducted in 2014 verified that the species now does occur at the lake. Southwestern willow flycatcher (*Empidonax traillii extimus*) was also not included in the 1999 BO. It is included in this BA due to the existence of potential habitat at Lake Success.

The below listed species have the potential to occur in the action area. An assessment of potential effects to these species is addressed in the enclosed BA.

Common Name	Scientific Name	Critical Habitat in the Action Area
Threatened and Endangered Species		
San Joaquin Kit Fox	*Vulpes macrotis mutica*	No
Least Bell's Vireo	*Vireo bellii pusillus*	No
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	No
San Joaquin Adobe Sunburst	*Pseudobahia peirsonii*	No

Construction of the road realignment could directly impact the San Joaquin adobe sunburst and would impact known historic habitat. The increase in gross pool elevation from 652.5 feet to 662.5 feet as a result of the spillway raise would expose an additional 659 acres of riparian and upland vegetation around the lake to periodic inundation during years of well-above average precipitation. This would indirectly impact San Joaquin kit fox. All construction would be more than one-half of a mile away from both least Bell's vireo and southwestern willow flycatcher habitat; impacts to these two species would be minimal. To avoid or minimize impacts to special status species, mitigation and appropriate avoidance and minimization measures will be followed as discussed in the enclosed BA.

Based on the information provided in this letter and the attached BA, we are requesting your opinion on our assessment that the project may affect, and is likely to adversely affect both San Joaquin kit fox and San Joaquin adobe sunburst. In addition, we request your concurrence with our determination that the project may affect, but is not likely to adversely affect, both least Bell's vireo and southwestern willow flycatcher under Section 7(a) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.).

A copy of this letter and its enclosure will be sent to Mr. Douglas Weinrich and Mr. Harry Kahler, U.S. Fish and Wildlife Service, 2800 Cottage Way, Suite W-2605, Sacramento, California 95825-1846

If you need any additional information or have questions regarding this action, please contact Dr. Yari Johnson, Biological Sciences Environmental Manager, at (916) 557-6937 or by e-mail: Yari.B.Johnson@usace.army.mil. We respectfully request a response within 30 days of the receipt of this letter due to the time frames associated with the project construction. Thank you for your attention to this matter.

Sincerely,

Mark T. Ziminske
Chief, Environmental Resources Branch

Enclosure

Tule River Spillway Enlargement Project
Supplemental Biological Assessment
for the
Road Relocation and Right Abutment Spillway Cut
Tulare County, CA

December 2019

U. S. Army Corps of Engineers
Sacramento District
Environmental Planning Section
1325 J Street
Sacramento, CA 95814-2922

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APPENDICES

1.0 INTRODUCTION

The U.S. Army Corps of Engineers, Sacramento District (Corps), is requesting reinitiation of consultation with the U.S. Fish and Wildlife Service (USFWS) under Section 7 of the Federal Endangered Species Act (ESA) to evaluate, on a biological assessment (BA) level, potential effects associated with design changes to the proposed Tule River Spillway Enlargement Project. A Biological Opinion (BO) for this project was issued December 1999, entitled "Formal Section 7 Consultation on the Proposed Permanent 10-foot Dam Elevation Increase at Lake Success in Tulare County, California" (1-1-99-F-0085; USFWS 1999a). This BA is prepared in accordance with the legal requirements set forth under regulations implementing Section 7 of the Endangered Species Act (ESA) (50 CFR 402; 16 U.S.C. 1536 (c)).

Re-initiation is being pursued for two reasons: (1) There are modifications to the proposed action since the original consultation in 1999. The road relocation and spillway widening to accommodate the ogee weir design were not covered in detail in the Tule River Basin Investigation Final Environmental Impact Statement/Report (FEIS/FEIR) (Corps 1999) and accompanying Biological Data Report due to insufficient information on the future location of the road and hydraulics of the spillway. (2) There are changes regarding listed species referenced in the BO (USFWS 1999a). The USFWS removed the Valley Elderberry Longhorn Beetle (VELB) (*Desmocerus californicus dimorphus*) from protected status in Tulare County since the species range ends more than 85 miles to the north (USFWS 2019). The USFWS delisted the Bald Eagle (*Haliaeetus leucocephalus*) on August 8, 2007. The Giant Garter Snake (*Thamnophis gigas*) is no longer found downstream from Lake Success along the Tule River, or anywhere else in Tulare County (USFWS 2017). Thus, these three species will not be evaluated in this document. Least Bell's vireo (*Vireo bellii pusillus*) was not covered in the 1999 BO since the species was not known to occur at Lake Success. Corps bird surveys conducted in 2014 verified that the species now does occur at the lake (Stewart 2014). Southwestern willow flycatcher (*Empidonax traillii extimus*) was also not included in the 1999 BO. It is included in this BA due to the existence of potential habitat at Lake Success.

1.1 Threatened, Endangered, Proposed Threatened or Proposed Endangered Species

The Corps received a species list for the project area from the USFWS's Information for Planning and Consultation (IPaC) online system on February 8, 2019 (Consultation Code 08ESMF00-2019-SLI-0972). The Corps requested and received an updated list on May 22, 2019, and October 31, 2019 (Appendix A). The latest updated list did not contain any changes. Species determined to have "No Effect" from the proposed action are detailed in Table 1 (attached at the end of this biological assessment).

The following Threatened, Endangered, Proposed Threatened or Proposed Endangered Species may be affected[1] by the proposed action:

San Joaquin Kit Fox (*Vulpes macrotis mutica*) **E**
Least Bell's Vireo (*Vireo bellii pusillus*) **E**

1 This document will discuss making the "may affect" and subsequent determinations in later sections.

Southwestern Willow Flycatcher (*Empidonax traillii extimus*) **E**
San Joaquin Adobe Sunburst (*Pseudobahia peirsonii*) **T**

E = Endangered, **T** = Threatened, **CH** = Critical Habitat.

There are no candidate species or other sensitive species within the proposed action area. The California condor (*Gymnogyps californianus*) is the only species with designated critical habitat in the Lake Success area. The critical habitat includes roughly the northern one-fifth of the lake. However, there is no appropriate breeding habitat for the condor within the project area and there would be no direct effects from the project on the critical habitat. As a result, the Corps has determined the proposed project would have no effect on the condor.

2.0 CONSULTATION TO DATE

December 17, 1999. USFWS Biological Opinion received, "Formal Section 7 Consultation on the Proposed Permanent 10-foot Dam Elevation Increase at Lake Success in Tulare County, California" (1-1-99-F-0085).

December 2018. Consultation re-initiated informally with Harry Kahler, USFWS Wildlife Biologist.

April 2-4, 2019. Site visit and biological reconnaissance surveys of the road relocation and increased pool surface area were conducted. Surveys conducted by a botanist (L. Guerrero, Corps), mammalogist and entomologist (E. Tomasovic, Corps), and an ornithologist (H. Kahler, USFWS) focused on environmental awareness and species distribution. Two new and previously undocumented locations of the San Joaquin adobe sunburst (*Pseudobahia peirsonii*) were discovered and are being entered into the California Natural Diversity Database (CNDDB).

July 15, 2019. Corps submitted Road Relocation and Right Abutment Cut BA to USFWS.

July 31, 2019. USFWS asked the Corps to adhere to the original determinations from the 1999 BO. The Corps responded on August 6, 2019, agreeing to adhere to the original BO determinations.

September 5, 2019. USFWS emailed Corps asking for a meeting.

September 12, 2019. USFWS and Corps met to discuss ESA consultation and coordination under the Fish and Wildlife Coordination Act (FWCA; 16 U.S.C. §661, et seq.) for the Tule River Spillway Enlargement Project. USFWS and Corps agreed that a revised BA would be submitted that updates the effects evaluation presented in the 1999 BO, superseding the July 15, 2019 BA.

3.0 DESCRIPTION OF THE PROPOSED ACTION

3.1 Background

Lake Success Dam is located on the main branch of the Tule River about 6 miles east of Porterville, California, in Tulare County. It is in the foothills of the Sierra Nevada moutains, fifty miles north of Bakersfield and sixty miles southeast of Fresno.

The Tule River Spillway Raise project consists of constructing a 10 foot-high concrete ogee weir across the spillway and raising the gross pool elevation (maximum lake level) from 652.5 feet to 662.5 feet (Figure 1; all elevations are NGVD29).

The project will be done in two construction phases:

Phase 1: Right Abutment Spillway Cut, Road Relocation, and Temporary Stockpiles
Construction Start: July 2020
Construction Completion: March 2021

Phase 2: Spillway Raise, Left Abutment Cut (if needed), Recreation Facilities, Highway 190 & Frazier Dike Armoring, and Utility Relocations.
Construction Start: October 2021
Construction Completion: May 2023

3.2 Authority

Authorization for construction of the Tule River Spillway Enlargement Project at Lake Success is provided by the Water Resources Development Act (WRDA) of 1999, Section 101 (b)(4) (Public Law 106-53, 17 August 1999), which authorized this flood damage reduction and water supply project based on the recommendations of the final report of the Chief of Engineers.

3.3 Proposed Action

The proposed action would decrease flood flows in the downstream distributaries mainly during the spring snowmelt season (Figure 2), thereby decreasing the flooding of adjacent agricultural lands and urban areas, and decreasing the impact of high water events on downstream levees and infrastructure. Currently, flooding downstream of Success Dam can cause extensive damage to residences, agricultural farmland, and public facilities. Under the current operations of the dam, water releases greater than 3,200 cubic feet per second (cfs) from Success Dam can cause damage to downstream agricultural areas (Corps 2011). The downstream channel capacity ranges from 10,000 cfs through the city of Porterville to as little as 1,000 cfs west of the city. Agricultural areas west of the city are the first areas where property damage and danger to residents have historically occurred, given a release greater than 3,200 cfs (Corps 2011).

Components of the proposed action consist of (Figure 3):

- Widening the spillway sill at Success Dam from 200 feet to 365 feet.

- Relocating the existing road through the spillway, Worth Drive/Avenue 146, to the new road bench constructed as part of the spillway widening.
- Restoring the lower third of the spillway to its original design grade using excavated material from the spillway widening.
- Constructing a 10-foot high concrete ogee weir over the existing spillway sill.
- Flood-proofing restrooms at the Tule and Rocky Hill recreation areas.
- Extending and widening the Tule recreation area boat ramp.
- Enlarging the existing parking area at Rocky Hill recreation area to replace parking areas lost to higher gross pool levels.
- Protecting in place the Tule recreation area well and storage tank by an earthen berm.
- Relocating the Rocky Hill recreation area storage tank, well, and metal shed to higher ground.
- Placing rock revetment along the State Highway 190 bridge abutments for erosion protection.
- Placing rock revetment (3,500 linear feet) along Frazier Dike for erosion protection.
- Raising fourteen transmission towers and 11,800 feet of power lines to meet minimum clearance criteria.
- Updating the Success Lake and Dam water control manual to reflect the change in flood storage capacity for the lake.

For Phase 1, the Corps, in partnership with its nonfederal sponsor, the Lower Tule River Irrigation District (LTRID), would widen the current spillway at Lake Success from 200 to 365 feet by removing a portion of the right bank abutment and incorporating a road bench within the new slope (Figures 4-9). The existing road through the spillway, Worth Drive/Avenue 146, would be relocated to the new road bench. Road relocation is required since the new ogee weir, constructed in Phase 2, would obstruct the road in its current location.

Worth Drive/Avenue 146 enables public access to the Rocky Hill recreation area and two private residences when the reservoir is not at full capacity. This road is currently located adjacent to the right abutment slope of the spillway. The Corps is proposing to relocate the road along the right abutment cut above the new proposed gross pool, removing the road from the spillway, to avoid most future road closures due to spillway engagement during high water (Figures 5, 8, and 9). The new road would become a public-use, Corps-maintained road and would remain open up to at least the 100-year flood event. In the past 58 years since Lake Success was built, lake levels have been high enough to close the road seven times (Figure 10).

Construction sequencing of the right abutment cut and road realignment would begin with the contractor staging equipment and conducting preliminary site preparation, including installation of construction trailers, power lines or generators, security fencing, and movement of equipment. After mobilization, vegetation and soil would be grubbed and stripped from the right abutment cut/new roadway area and relocated to the staging/stockpile areas (Figure 7).

Next, drilling and explosives would be used to shape the spillway abutment and road bench. Excess blast rock would be used to repair the lower emergency spillway gradient and temporarily stockpiled for use in Phase 2 to armor Frazier Dike and the Highway 190 bridge footing and abutment. Detailed design plans for Phase 1 are included in Appendix B. The lower emergency spillway was damaged in December 1966 during a flood event (Figure 11). Blasted rock material from the right abutment cut would be used to restore the spillway to its original, pre-1966, grade and elevation (for design details see Appendix B, sheet GC-103).

Carefully designed, controlled blasts would be used to break, lift, and push broken rock anywhere from 10 to 30 feet during the right abutment cut and road bench construction. Flyrock may occur when a shot is under burdened, *i.e.* when there is only a small amount of rock in front of the blasthole. In such a case, flyrock may travel 75 to 150 feet. The contractor would be stopped from blasting if flyrock travels more than 250 feet from a bench until the reasons for flyrock have been determined and the blasting practice modified. The 750 and 2,500-ft buffers shown in figures 8 and 9 are for safety purposes only and do not represent flyrock travel distances (C. Breeds, President of Blasting, Sub Terra, Inc, e-mail message, November 6, 2019). After each blast, excavators and dump trucks would move debris to temporary stockpiles.

The spillway raise, Highway 190 bridge abutment and Frazier Dike armoring, flood-proofing of recreation facilities, and utility relocations would occur as part of Phase 2 construction (Figure 3). Implementation of these features is the same as was described in the 1999 project documentation. The Lake Success Water Control Manual would also be updated to reflect the changes in the dam's flood storage capabilities resulting from the spillway raise.

3.4 Action Area

The action area is defined as the footprint of the proposed project components, temporary work areas during construction, and the properties around Lake Success within the new proposed gross pool. In addition, the action area includes those areas of the Tule River 100-year floodplain downstream of Success Dam that would be affected by the change in frequency of flooding caused by the spillway raise (Figures 1-3).

The temporary work area for Phase 1 would cover approximately 130 acres of Corps property (Figure 4). The actual construction footprint (area of disturbed ground) would cover approximately 14 acres (Figures 7 and 9).

For Phase 2, construction of the ogee weir would occur within the newly enlarged spillway. Flood-proofing, protection, and relocation of existing infrastructure would occur within the recreation areas. Blasted rock from Phase 1, would be used to armor Frazier Dike and the abutments of the State Highway 190 bridge (Figure 3). Raising fourteen transmission towers and 11,800 feet of power lines to meet minimum clearance criteria would temporarily occur in the existing powerline right of way.

Currently, Success Dam controls downstream flows by making releases through its outlet works. When the reservoir elevation exceeds the emergency spillway crest elevation, uncontrolled flows

are released via the spillway into the Tule River. The current emergency spillway crest elevation (652.5 feet) corresponds to a flood event with a 2.2 percent annual chance of exceedance (ACE) (approximately, the "46-year flood"). See figures 12-14. The new ogee weir, installed during Phase 2 of this project, is designed to reduce flooding immediately below the dam in the Porterville area to a less than one percent annual chance of exceedance flood ("100-year flood").

3.5 Avoidance and Minimization Measures

The following measures will be implemented by the Corps, its local partners, and/or the construction contractor to avoid or minimize project effects on the San Joaquin kit fox, least Bell's vireo, southwestern willow flycatcher, and the San Joaquin Adobe sunburst.

- Prior to construction, an employee education program will be conducted consisting of a brief presentation of San Joaquin kit fox, Southwestern willow flycatcher, least Bell's vireo, San Joaquin adobe sunburst, California condor, Bald and Golden eagles, and migratory birds by persons knowledgeable in biology and legislative protection. The program will include the occurrence of species in the area, its description and life history, and an explanation of the species status and protection under the ESA.
- A representative will be appointed who would be the contact for any employee/contractor who might find dead, injured, or entrapped threatened and endangered animals or new plots of threatened and endangered plants in the work area. This representative will contact the USFWS immediately.
- A Corps botanist will conduct pre-construction surveys within the construction footprint during peak-flower, based on bloom times of known populations in the area, to ensure that no San Joaquin adobe sunburst are present. If the species is present, the Corps will undertake the following mitigation measures: (a) as possible, avoid plants and erect a 25-foot buffer using exclusionary fencing; (b) if avoidance is not practical, plants will be hand dug and transplanted outside the construction footprint under the guidance of a qualified botanist or restoration ecologist; (c) transplanted plant locations will first be chosen with a preference for having existing San Joaquin adobe sunburst plants, second, former known adobe sunburst location, and third, an area with similar slope, aspect and soils; (d) in addition to transplanting, topsoil will be collected in a 6-foot buffer around the plants to help secure the seedbank; (e) collected topsoil will be placed in six to twelve-inch wide, circular, shallow pits near the transplanted plants; (f) during Phase 1 & 2 construction, transplanted plants will be monitored by a qualified biologist during each growing season via flower counts, percent cover, and stem length measurements; and (g) an annual monitoring report will be submitted to USFWS each November until one year after construction is complete. Any existing San Joaquin adobe sunburst plants located near the construction footprint will be protected with exclusionary fencing for the duration of the project.
- A certified kit fox biologist, considered qualified by the USFWS, will conduct pre-activity surveys for kit fox presence within 30 days, and to the extent practicable, within 14 days of construction initiation using methodologies acceptable to the USFWS. Surveys will cover all areas potentially affected by ground disturbing activities associated with the project, including vehicle travel and staging.

- Project-related vehicles will observe a daytime speed limit of 15-mph and a nighttime speed limit of 10-mph throughout the site in all project areas, except on county roads and State and Federal highways. This is particularly important at night when kit foxes are most active. Night-time construction will be minimized to the extent possible. Off-road traffic, outside of designated project areas, will be prohibited.
- Stormwater runoff will be controlled using standard construction BMPs and equipment (straw wattles, silt fencing, etc.).
- All food-related trash items such as wrappers, cans, bottles, and food scraps will be disposed of in securely closed containers, and removed at least once a week from a construction or project site. Daily removal is preferred.
- No firearms will be allowed on the project site.
- No pets, such as dogs or cats, will be permitted on the project site to prevent harassment, mortality, or destruction of dens or burrows.
- To prevent inadvertent entrapment of kit foxes, or other animals, during the construction phase of a project, all excavated, steep-walled holes or trenches more than 2-feet deep will be covered at the close of each working day by plywood or similar materials. If the trenches cannot be closed, one or more escape ramps constructed of earthen-fill or wooden planks would be installed. Before such holes or trenches are filled, they will be thoroughly inspected for trapped animals. If at any time a trapped or injured animal is discovered, the USFWS would be contacted.
- In the case of trapped animals, escape ramps or structures would be installed immediately to allow the animal(s) to escape, or the USFWS would be contacted for guidance.
- Kit foxes are attracted to den-like structures, such as pipes, and may enter stored pipes and become trapped or injured. All construction pipes, culverts, or similar structures with a diameter of 4-inches or greater that are stored at a construction site for one or more overnight periods will be thoroughly inspected for kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a kit fox is discovered inside a pipe, that section of pipe would not be moved until the USFWS has been consulted. If necessary, and under the direct supervision of the biologist, the pipe may be moved only once to remove it from the path of construction activity, until the fox has escaped.
- Use of rodenticides and herbicides in project areas will be restricted. This is necessary to prevent primary or secondary poisoning of kit foxes and California condor, and the depletion of prey populations on which they depend. All uses of such compounds would observe label and other restrictions mandated by the U.S. Environmental Protection Agency, California Department of Food and Agriculture, and other State and Federal legislation, as well as additional project-related restrictions deemed necessary by the USFWS. If rodent control must be conducted, zinc phosphide should be used because of a proven lower risk to kit fox.

4.0 STATUS OF THE SPECIES AND CRITICAL HABITAT IN THE ACTION AREA

For species that are described and covered in this consultation, habitat preferences and distributions are based on published data, agency documents, and review of the IPaC from the USFWS (Consultation Code: 08ESMF00-2019-SLI-0972), personal conversation with USFWS Biologist Harry Kahler, and an environmental survey conducted from 2-4 April 2019.

4.1 San Joaquin Kit Fox

Status. The San Joaquin kit fox (*Vulpes macrotis mutica*) was listed as an endangered species on March 11, 1967 (USFWS 1967; 32 FR 4001), and by the state of California as a threatened species on June 27, 1971. A Recovery Plan was approved in 1983 (USFWS 1983), and an updated Recovery Plan that covered 34 upland species in the San Joaquin Valley was approved in 1998 (USFWS 1998b). The 1998 Recovery Plan identified the San Joaquin kit fox as an umbrella species. Recovery actions for the San Joaquin kit fox are critical to the recovery of many other listed species because the kit fox occurs in the same natural communities and requires relatively large areas of natural habitat, thus providing an umbrella of protection for other species that require smaller habitat blocks (USFWS 1998b). Critical habitat has not been designated for this species.

Distribution. Range for the San Joaquin kit fox includes the San Joaquin Valley, encompassing portions of the valley floor and adjacent foothills and interior Coast Range valleys, historically from as far north as Tracy (San Joaquin County) and La Grange (Stanislaus County) and south to Kern County (Grinnell et al. 1937; USFWS 2010). By 1930, the range was believed to have decreased to only the southern and western parts of the San Joaquin Valley and adjacent foothills and interior Coast Range Valleys, but subsequent research found these foxes in many additional areas, northward to Contra Costa County, including areas where the species previously had not been detected (USFWS 2010). However, some recently documented locations likely reflect dispersing individuals rather than resident populations, and many populations are small, isolated, and/or declining or apparently extirpated (USFWS 2010).

Historically, this species occurred in several San Joaquin Valley native plant communities. In the southernmost portion of the range, these communities included valley sink scrub, valley saltbush scrub, Upper Sonoran subshrub scrub, and annual grassland (USFWS 1998b). San Joaquin kit foxes also exhibit a capacity to utilize habitats that have been altered by people. They are present in many oil fields, grazed pasturelands, and "wind farms" (Cypher 2000). They also utilizes oak savanna and some types of agriculture (e.g. orchards and alfalfa), although the long-term suitability of these habitats is unknown (Jensen 1972; USFWS 1998b). Kit foxes can inhabit the margins and fallow lands near irrigated row crops, orchards, and vineyards, and may forage occasionally in these agricultural areas (USFWS 1998b; Cypher et al. 2014). The San Joaquin kit fox seems to prefer more gentle terrain and decreases in abundance as terrain ruggedness increases (Grinnell et al. 1937; Morrell 1972; Warrick and Cypher 1998).

Locally, the San Joaquin kit fox was more prevalent in the 1970s. Based on CNDDB, eleven occurrences are within ten miles of the project area, all to the west. None have been documented in the Lake Success quadrangle, which encompasses the project area. Only two occurrences have

been documented since the 1970s; ten miles and eight miles away from the proposed action in 1992 and 1989, respectively (CDFW 2019). The closest documented occurrence is six miles from the proposed action (CDFW 2019). Downstream, there are fourteen kit fox occurrences within or adjacent to the current Tule River and Tulare Lakebed 100-year floodplain, all from the early to mid-1970s.

Life History. In September and October, adult females begin to excavate and enlarge natal dens (Morrell 1972), and adult males join the females in October or November. Typically, pups are born between February and late March following a gestation period of 49 to 55 days (Egoscue 1962; Spiegel and Tom 1996; USFWS 1998b). Mean litter sizes are between 2 and 4 pups. Reproductive rates, the proportion of females bearing young, of adult San Joaquin kit foxes vary annually with environmental conditions, particularly food availability. Although most young kit foxes disperse less than 5 miles (Scrivner et al. 1987), dispersal distances of up to 76.3 miles have been documented for the San Joaquin kit fox (USFWS 1998b). Dispersal can be through disturbed habitats, including agricultural fields, and across highways and aqueducts. Some kit foxes delay dispersal and may inherit their natal home range.

Kit foxes have been reputed to be poor diggers, and their dens are usually located in areas with loose-textured, friable soils (O'Farrell 1984). However, the depth and complexity of their dens suggest-that they possess good digging abilities, and kit fox dens have been observed on a variety of soil types (Reese et al. 1992; USFWS 1998b). Kit fox dens extend from 4.3 ft to almost 10 ft below the soil surface (Egoscue 1956; Morrell 1972; O'Neal et al. 1987). Some studies have suggested that where hardpan layers predominate, kit foxes create their dens by enlarging the burrows of California ground squirrels (*Spermophilus beecheyi*) or badgers (*Taxidea taxus*) (Jensen 1972; Morrell 1972). In parts of their range, particularly in the foothills, kit foxes often use ground squirrel burrows for dens (Orloff et al. 1986). A more recent study in the Great Basin, found that kit foxes are seeking more hilly and rocky terrain for dens, potentially due to competition and predation by coyotes (Arjo et al. 2003). Kit fox dens are commonly located on flat terrain or on the lower slopes of hills, fewer are found on the crests of hills or ridges (Reese et al. 1992). Common locations for dens include washes, drainages, and roadside berms. Kit foxes also commonly den in human-made structures such as culverts and pipes (Reese et al. 1992; Spiegel et al. 1996).

Den use varies greatly among kit foxes. Dens are used by kit foxes for temperature regulation, shelter from adverse environmental conditions, and escape from predators. Natal and pupping dens may include from two to eighteen entrances and are usually larger than dens that are not used for reproduction (O'Farrell et al. 1980; O'Farrell and McCue 1981). Natal dens may be reused in subsequent years (Egoscue 1962). It has been speculated that natal dens are located in the same location as ancestral breeding sites. Active natal dens are generally 1.2 to 2 miles from the dens of other mated kit fox pairs. Natal and pupping dens usually can be identified by the presence of scat, prey remains, matted vegetation, and mounds of excavated soil outside the dens (O'Farrell 1984). Kit foxes often change dens and may use many dens throughout the year; however, evidence that a den is being used by kit foxes may be absent (Reese et al. 1992). A kit fox can use more than 100 dens throughout its home range, although on average, an animal will use approximately 12 dens a year for shelter and escape cover (Koopman et al. 1998; Cypher et al. 2001). Possible reasons for changing dens include infestation by ectoparasites, local depletion

of prey, or predator avoidance. In the southern San Joaquin Valley, kit foxes were found to use up to 39 dens within a denning range of 320 to 482 acres (Morrell 1972).

The diet of the San Joaquin kit fox varies geographically, seasonally, and annually, based on temporal and spatial variation in abundance of potential prey. Known prey species of the kit fox include white footed mice (*Peromyscus* spp.), insects, California ground squirrels, kangaroo rats (*Dipodomys* spp.), San Joaquin antelope squirrels, black-tailed hares (*Lepus calijornicus*), and chukar (*Alectoris chukar*) (Jensen 1972; Archon 1992; Cypher et al. 2014). Kit foxes also prey on desert cottontails (*Sylvilagus audubonii*), ground-nesting birds, and pocket mice (*Perognathus* spp.) (Cypher et al. 2014). Resource competition between coyotes and foxes may be quite high especially when prey resources are scarce. Competition is common in semi-arid, central California, especially during drought years and results in kit fox mortalities. San Joaquin kit foxes are primarily nocturnal, although individuals are occasionally observed resting or playing (mostly pups) near their dens during the day.

Kit foxes occupy home ranges that vary in size from 1.7 to 4.5 square miles (White and Ralls 1993). Average distances traveled each night range from 5.8 to 9.1 miles and are greatest during the breeding season (Cypher 2000).

Less than 20 percent of the habitat within the historical range of the kit fox remained when the subspecies was listed as federally-endangered in 1967, and there has been a substantial net loss of habitat since that time. The primary factor contributing to this restricted distribution was the conversion of native habitat to irrigated cropland, industrial uses, and urbanization (Laughrin 1970; Jensen 1972; Morrell 1972). Approximately 1.97 million acres of habitat, or about 66,000 acres per year, were converted in the San Joaquin region between 1950 and 1980 (California Department of Forestry and Fire Protection 1988). The counties specifically noted as having the highest wildland conversion rates included Kern, Tulare, Kings, and Fresno, all of which are occupied by kit foxes. Extensive habitat destruction and fragmentation have contributed to smaller, more-isolated populations of kit foxes. Small populations have a higher probability of extinction than larger populations because their low abundance renders them susceptible to stochastic (i.e., random) events such as high variability in age and sex ratios, and catastrophes such as floods, droughts, or disease epidemics (Lande 1988; Saccheri et al. 1998; Cypher et al. 2014). Owing to the probabilistic nature of extinction, many small and isolated populations will go extinct when faced with these stochastic risks.

4.2 Least Bell's Vireo

Status. The least Bell's vireo (*Vireo bellii pusillus*) was listed as a Federally endangered species on May 2, 1986 (51 FR 16474). The final critical habitat designated in 1994 encompasses approximately 36,000 acres at ten localities in portions of Santa Barbara, Ventura, Los Angeles, San Bernardino, Riverside, and San Diego Counties in southern California. Lake Success is outside the designated critical habitat.

Distribution. The least Bell's vireo is a small gray migratory songbird whose historical range extended from Baja California, Mexico, to the northern Sacramento Valley of California, and from the California coastal ranges east to Death Valley. Riparian habitat losses and increases in

brown-headed cowbird populations starting in the 1930s eventually caused the vireo to become essentially extinct north of the Transverse Ranges of southern California (Grinnell and Miller 1944; Gaines 1974; Goldwasser et al. 1980; Garrett and Dunn 1981; USFWS 1986). Although still absent from major portions of its historical range, the vireo has responded well to conservation management actions. In a 5-year status review, USFWS (2006) determined that the number of occupied vireo territories had increased ten-fold (291 to 2,968) since the 1986 listing.

Corps surveys in 2014 detected least Bell's vireo at Lake Success (Figure 15). At least two Bell's vireo territories/breeding pairs were observed and recorded within the Tule River riparian area (Stewart 2014). Prior dry years had allowed dense riparian and woodland vegetation to regenerate and become established in areas well below the gross pool elevation where it would normally be inundated.

Life History and Habitat Requirements. The least Bell's vireo is one of four recognized subspecies of Bell's vireo in the United States (AOU 1957). Least Bell's vireos are obligate riparian breeders, nesting along stream courses typically dominated by willows (*Salix* spp.), cottonwoods (*Populus* spp.), oaks (*Quercus* spp.), and/or mule fat (*Baccharis salicifolia*). In California, this subspecies is strongly associated with riparian stands with dense understory vegetation between about 2 and 10 feet above the ground (Brown 1993; Kus 2002). Vireos occur in disproportionately high frequencies in the wider sections (greater than 250m) of the riparian relative to site availability (RECON 1989).

Vireos spend the winter in southern Baja California, Mexico, and arrive on breeding grounds in California in March or April (USFWS 1998c; Kus 2002). Grinnell and Miller (1944) reported later arrival (early April) for historic northern California populations. The key structural components of suitable breeding habitat are a dense layer of vegetation within 3-6 ft of the ground and a canopy layer (USFWS 1994; Kus 2002). Nesting least Bell's vireos prefer early and mid-successional riparian habitats that contain low, dense, shrubby vegetation. Nests are typically built of leaves, bark, willow catkins, and spider webs in a fork of a tree or shrub within 3 feet of the ground (Franzreb 1989). A clutch of 3-4 eggs is incubated by both parents for 14 days, and nestlings leave the nest at about 12-14 days, after which time they are cared for by the parents for another 2 weeks or more. Vireos may make multiple nesting attempts after nest failure but typically produce no more than one successful clutch during a season (Franzreb 1989). Most vireos leave the breeding grounds for Mexico by late September or earlier (Franzreb 1989).

4.3 Southwestern Willow Flycatcher

Status. The southwestern willow flycatcher (*Empidonax traillii extimus*) was listed as a Federally endangered species on February 27, 1995 (68 FR 10485). Additionally this subspecies are designated as Sensitive species in California by the U.S. Forest Service (USFS) Region 5, and by the USFWS Region 1. The final critical habitat designation includes 1,227 floodplain miles in California, Arizona, Nevada, Utah, Colorado, and New Mexico encompassing a total area of approximately 208,973 acres within the 100-year floodplain or flood-prone areas. Lake Success is outside the designated critical habitat area.

Distribution. Southwestern willow flycatchers are neotropical migrants that breed in patches of riparian habitat throughout the American southwest. This southernmost subspecies of willow flycatcher is found south of the Owens Valley, the South Fork Kern River, and the Santa Ynez River. Their breeding habitat currently ranges from southern California, through southern Nevada, southern Utah, Arizona, New Mexico, southwestern Colorado, and historically included western Texas and extreme northwestern Mexico. They travel south to winter ranges in Mexico, Central America, and northern South America. Within the range of southwestern willow flycatchers northbound migrants traveling to central and northern California and points north pass through areas where resident southwestern willow flycatchers are already breeding in Late May and early June. This creates confusion during southwestern willow flycatcher surveys because migrating birds often sing at their stopover locations (Sogge et al. 1997a). While their current distribution is similar to their historic range, southwestern willow flycatcher population numbers have declined precipitously in response to the loss of suitable riparian habitat throughout the region.

The greatest historical factor in the decline of the willow flycatcher is the extensive loss, fragmentation, and modification of riparian breeding habitat. Large-scale losses of wetlands have occurred, particularly those associated with riverine systems in both valley and montane settings (Johnson and Haight 1984; Unsicker et al. 1984; Johnson et al. 1987). Changes in the hydrology and riparian plant community have reduced, degraded and eliminated nesting habitat for the willow flycatcher, contributing to its decline in distribution and numbers (Serena 1982; Taylor & Littlefield 1986; Unitt 1987; Schlorff 1990). Habitat losses and changes have occurred (and continue to occur) because of urban, recreational, and agricultural development, water diversion and impoundment, channelization, livestock grazing, and replacement of native habitats by introduced plant species (Klebenow & Oakleaf 1984; Katibah 1984; Dull 1999). Hydrological changes, natural or man-made, can greatly reduce the quality and extent of willow flycatcher habitat (Sogge et al. 1997b).

There is roughly 160 acres of willow riparian woodland where the Tule River flows into Lake Success that is adequate southwestern willow flycatcher habitat (Figure 15). It covers an extensive area at the mouth of the river, primarily in areas that are presently inundated by periodic high lake levels during most years. Black willow (*Salix gooddingii*) is the dominant tree species (Stewart 2014). Most recent Corps surveys have not detected willow flycatchers of any subspecies at Lake Success (Stewart 2014). These surveys followed USFWS standard protocols (Sogge et al. 1997b; USFWS 2000). However, in 2005, Jones and Stokes biologists under contract by the Corps observed a single bird for approximately 15 minutes that was positively identified as a willow flycatcher, although it did not vocalize and therefore cannot be considered a positive detection under the USFWS's survey protocol (Sogge et al. 1997b; USFWS 2000). The willow flycatcher was not observed again during subsequent surveys during 2005 (Stewart 2014). This bird would be classified as a probable migrant under the USFWS's protocol, meaning that it was probably a subspecies of willow flycatcher other than the federally-listed southwestern willow flycatcher and that it was only in the study area temporarily while migrating to more northern areas. The federally listed subspecies of willow flycatcher (*E. t. eximus*) is not known to occur north of the Kern River in the western Sierra Nevada, although it does occur in desert riparian habitats in Owens Valley in the eastern Sierra Nevada (69 Federal Register [FR] 60706-60786).

Life History and Habitat Requirements. The southwestern willow flycatcher is a small passerine less than 15 cm long from the tip of its bill to the tip of its tail. It has a brownish-olive to gray-green upper body, a whitish throat contrasting with a pale olive breast, a pale yellow belly, and two light wing bars. Males and females do not differ in plumage, but juveniles differ from adults by having buffy wing bars. Southwestern willow flycatchers require moist microclimatic and vegetative conditions, and breed only in dense riparian vegetation near surface water or saturated soil. While wet conditions are uniformly required, the structure and species of vegetation in which they nest vary by region and availability. The birds frequently build nests in nonnative tamarisk (*Tamarix* spp.), as well as in native willow (*Salix* spp.), typically in vegetation stands of 4–7 m in height. Nesting habitat patches can range widely in size, from as small as 0.6 ha to as much as 200 ha, although the majority of patches tend towards the smaller end of the range.

Regardless of the plant/hydrologic combination, riparian/meadow sites used by breeding willow flycatchers vary in size and shape, and may contain relatively dense, linear, stands of shrubs, or irregularly-shaped mosaics of dense vegetation with open areas in between. Willow flycatcher territories generally contain open water, boggy seeps, or saturated soil. Although these territories all tend to have some surface water early in the season, the amount that persists through the summer can vary widely from year to year depending on: the snowpack (onsite and/or upstream), the hydrology, and the ability of the soils at the site to hold water (Ratliff 1985; Weixelman et al. 1999). At some southwestern willow flycatcher sites, vegetation may be immersed in standing water during a wet year, but be hundreds of meters from surface water in dry years, this is particularly true of reservoir sites. At other breeding sites where the river channel has been recently modified or the river channel has changed naturally, there may be a total absence of water or visibly saturated soil for several years. However, it is not known how long such sites will continue to support riparian vegetation and/or remain occupied by breeding willow flycatchers (Sogge et al. 1997b).

Southwestern willow flycatchers spend only 3–4 months of the year paired with a mate for the breeding season. They defend a small (typically <1 ha) breeding territory during this time, which is often clumped with nearby territories of other flycatchers in a semi-colonial fashion. They can occur singly or near other flycatchers during migration and on the wintering grounds. Males often exhibit site fidelity by returning to the general area of the previous year's breeding grounds. Because of the dynamic nature of riparian habitat, however, (a single flood can destroy an entire patch), flycatchers are known to move among sites in their breeding grounds, either within the same year or from year to year. Southwestern willow flycatchers usually pair with a single mate during the breeding season, although polygyny (multiple female mates) has been documented at low rates. Males arrive on breeding grounds in late April to early May to establish territories, approximately 1–2 weeks before the females arrive. After pairing, the female builds an open cup nest from leaves, grass, fibers, feathers and animal hair, approximately 9.5 cm high and 8.5 cm wide (outside dimensions), exclusive of any dangling material at the bottom (Sanders & Flett 1989; Bombay 1999). Nests are typically placed in the fork of a branch with the nest cup supported by several small-diameter vertical stems. Nests are placed at an average of 4.6 m in height, but they can range from 1–12 m. Nest height also varies considerably and may be correlated with height of nest plant, overall canopy height, and/or the height of the vegetation strata that contains small twigs and live growth (Sogge et al. 1997b). In late May to early June,

the female lays 3–4 buffy eggs with brown markings in a circle at the blunt end of the egg. She incubates them for 12–15 days, and then both the female and male tend the young during the 12–15 day nestling stage. After fledging, young stay close to the nest for a few days, and do not leave the natal area for at least 14–15 days. During this time, both adults respond to the loudly begging fledglings by bringing them food. Some pairs will attempt to raise a second brood later in the season, particularly if their first nesting attempt fails. Nests with eggs have been observed as late as 30 August, with nestlings into mid-September.

Second clutches after a successful first nest are occasionally reported for the southwestern willow flycatcher. Willow flycatchers often attempt a second and even third nest after nest failures (Bombay 1999, Morrison et al. 1999). Replacement nests are built in the same territory, either in the same nest plant or at a distance of 30 m or more from the previous nest. Frequently, willow flycatchers will disassemble failed nests in order to build new nests (McCabe 1991). On a few occasions re-nesting flycatchers have been known to reuse the same nest in a single year (Yard & Brown 1999). In California, replacement nest building and egg laying can occur (uncommonly) as late as early August (Stafford & Valentine 1985, Sanders & Flett 1989) (Figure 16). Clutch size (and therefore potential productivity) usually decreases with each nest attempt (Whitfield and Strong 1995). Breeding populations may also reappear at unoccupied sites following 1-5 yr. absences (Sogge et al.1997a). Therefore, one cannot assume that a habitat is unsuitable or unoccupied in the long-term based on flycatcher absence during only a single year, especially if there is evidence of recent occupancy.

4.4 San Joaquin Adobe Sunburst

Status. The San Joaquin adobe sunburst (*Pseudobahia peirsonii*) was federally listed as threatened on February 6, 1997 (USFWS 1997; 62 FR 5542). The San Joaquin adobe sunburst is State-listed as endangered. No formal designation for critical habitat has been designated for this species.

Distribution. San Joaquin adobe sunburst, a member of the tarweed tribe, are restricted to heavy, adobe clay soils with slight slopes on valley floors and rolling hills in scattered location in northern Kern County, Tulare, and Fresno Counties (USFWS 2007). It is endemic to the eastern San Joaquin Valley and its historic range is unknown (Stebbins 1991). The population currently is limited to about 41 extant occurrences in valleys and flats and in the foothills of the Sierra Nevada (CDFW 2019). Extant populations are concentrated in three areas: the Round Mountain-Wahtoke area in Fresno County, the Porterville-Visalia region in Tulare County, and the Pine Mountain-Woody region in Kern County (USFWS 1992, 1997).

San Joaquin adobe sunburst are usually found on Porterville clay soil series, but can be found less frequently on Academy, Centerville, Cibo and Mt. Olive clay soil series (Stebbins 1991). Growing in areas where the average annual rainfall is less than 10 inches, these soils may be favored by the San Joaquin adobe sunburst for their ability to hold moisture longer into the summer dry season than other soils (Stebbins 1991). It occurs at elevations ranging from 390 to 2,600 feet above mean sea level primarily in annual grassland plant communities, but sometimes in annual grassland-blue oak woodland ecotone communities (Stebbins 1991). San Joaquin adobe sunburst grows in grasslands dominated by non-native annual grasses, mustards, and

filarees. The intrusive and aggressive nature of these herbaceous weeds appears to be detrimental to the quality of habitat for the San Joaquin adobe sunburst. Common associates within the study area include wild oat (*Avena fatua*), red brome (*Bromus madritensis* ssp. *rubens*), common fiddleneck (*Amsinckia menziesii* var. *intermedia*), soft chess (*Bromus hordeaceus*), redstem filaree (*Erodium cicutarium*), and charlock (*Sinapis arvensis*) (USFWS 2007).

Of the 51 historically known occurrences of San Joaquin adobe sunburst, 10 have been or are now presumed to be extirpated, all in Tulare County. Of those 10, three occurrences have been or are presumed to have been extirpated since 1999 (CDFW 2019). Approximately 80 percent of the remaining plants of this species are contained in 4 populations and 18 of the 41 extant occurrences contain less than 250 plants in a given year (CDFG 2001). Populations continue to be threatened by agricultural activities, urbanization, water projects, transmission line and road maintenance, soil erosion, livestock grazing, and competition with non-native weeds (CDFG 1992; USFWS 1992).

The extant population at Lake Success is considered in fair condition and is a remnant population of a larger one that used to occupy an area that is now part of Lake Success (Figure 17). The Lake Success population of San Joaquin adobe sunburst has varied from 50 to over 300 individual plants covering an estimated 3-acre area along the west side of Lake Success (Stebbins 1991). An extensive vegetation survey conducted at Lake Success in the spring of 2006 by EDAW, Inc., reported an undocumented occurrence of San Joaquin adobe sunburst on the southwest side of Boat Island, which included 45 individuals (Unger and Beyerl 2006). This same survey documented approximately 150 individuals on the west side of Lake Success in two general locations (corresponding to CNDDB occurrences 19 and 46).

Part of Occurrences 10, 19 and all of Occurrence 46 lie within the temporary work area for Phase 1 (Figure 18). Occurrence 19 was generally mapped in 2002 by Dr. Ellen Cypher as three polygons (Unger and Beyerl 2006; CDFW 2019). Unger and Beyerl used GPS technology to get a more accurate location in 2006 (Figure 18). Occurrence 10, west of the spillway along Avenue 146, was first reported in 1974. Occurrence 19, between Rocky Hill and Lake Success, was first reported in 1938. Occurrence 46, immediately north of the spillway, was first reported in 2006. Occurrence 19 has not been documented since 2006, while Occurrence 46 was last documented in 2014. It is important to note that this species, as with most annuals, is cyclical and population sizes fluctuate greatly from year to year due to environmental variation (Stebbins 1991). In 2019, two previously undocumented populations were located near Frazier Dike and where the Tule River enters Lake Success. The new footprint of the water level caused by increasing the gross pool of Lake Success, coupled with wind and wave runup, could impact two occurrences of the San Joaquin adobe sunburst, one approximately every 10 years and the other approximately every 100 years (these details will be confirmed with LiDAR and on-the-ground elevation surveying in early 2020). Locations affected include part of the Rocky Hill historic subpopulation and the newly discovered occurrence 800 feet south of Frazier Dike.

Life History and Habitat Requirements. This annual herb species is a member of the aster family (Asteraceae) and has woolly gray stems and foliage (USFWS 1998a; Johnson 2012. The erect stems are typically from 4 to 18 inches tall. The alternate leaves are divided twice into smaller lobes (bipinnatifid), are triangular in outline, and 1 to 3 inches long (Johnson 2012). San Joaquin

adobe sunburst (also called Tulare pseudobahia) is distinguished from other species of *Pseudobahia* by characteristics of the phyllaries and leaves (USFWS 2007). Each plant produces a single head of yellow disk and ray flowers at the ends of the branches between March and May. The San Joaquin adobe sunburst requires sufficient rainfall; therefore, during drought years population sizes decrease substantially. Additionally, the timing of grazing can impact the success of the species (Stebbins 1991; USFWS 2007).

5.0 ENVIRONMENTAL BASELINE AND CUMULATIVE EFFECTS

This section will be used along with the species and critical habitat information from the preceding section to describe the pre-action condition of the species and critical habitat that will be exposed to the stressors and subsidies of the action(s) under consultation. The purpose of this section is also to provide a summary of the relevant local information on the impacts that other factors (human and natural) in the action area have had on the viability of the species and value of critical habitat. These other factors may have occurred in the past, may continue to affect the species and habitat today, or will affect the species and habitat in the future.

The information contained in this section is based upon field reconnaissance, literature searches, and database queries. The aerial photographs, CNDDB, and IPaC were reviewed prior to field reconnaissance visits. In addition to these references, Corps biologists reviewed species literature. All of the above were used to determine the potential for the species listed in Table 1. Field surveys (December 2018, February 2019, and April 2-4, 2019) included recording existing biological resources in and round the Action Area, assessing the Action Area for suitability to support federally listed and candidate species. Habitats were mapped and field notes were recorded.

5.1 Environmental Baseline

Lake Success is located within the foothills of the southern Sierra Nevada mountains. Northwest and southwest trending hills and broad valleys typify the area. The foothill belt is 12 miles wide and merges with increasing relief into the Sierra Nevada mountains. The Tule River is the major stream in this area, with about 390 square miles of Tule River drainage above Lake Success. The valley area downstream of the dam is relatively flat due to alluvial deposits from the river. The Tule River flows from the reservoir through Porterville, and continues thirty-eight miles through agricultural areas to Tulare Lakebed (Figure 2).

The Tulare Lakebed is part of a closed interior drainage system with no access to discharge into the sea. The lakebed is located towards the south end of the San Joaquin Valley, where it receives water from the Kern, Tule, and Kaweah Rivers, as well as from southern distributaries of the Kings River. It was separated from the rest of the San Joaquin Valley by tectonic subsidence and alluvial fans extending out from Los Gatos Creek in the Coast Ranges and the Kings River in the Sierra Nevada. Above a threshold elevation of 207 to 210 feet, it can overflow into the San Joaquin River; however, no overflows have occurred after 1878 due to increasing diversions of tributary waters for agricultural irrigation and municipal water uses. The Tulare lakebed was dry by 1899, except for residual wetlands and occasional floods. Over time, the decreasing lake size allowed agriculture to move into the productive lakebed deposits in

the valley. Due to the closed nature of this system, high water years have a potential to flood agricultural lands in the lakebed.

For Phase 1, the proposed action/temporary work area is currently recreation land (parking lots and boat ramps), roads, and pastured annual grassland (Figure 1). Pastured annual grassland covers 99 acres of the Phase 1 temporary work area, while roads and recreation land cover 39 acres. Within the actual construction footprint (~14 acres), 8.4 acres are pastured annual grassland, and 5.6 acres are existing roads. The soils are mostly clay textured and are shallow to bedrock (Figure 19; Soil Survey Staff). Soil surveys indicate that bedrock is typically encountered 9 to 35 inches below the soil surface (Soil Survey Staff).

For Phase 2, construction of the ogee weir would occur within the newly enlarged spillway. Flood-proofing, protection, and relocation of existing infrastructure would occur within the recreation areas, which are mostly mowed lawn, pavement, and ornamental trees. Blasted rock from Phase 1, would be used to armor Frazier Dike and the abutments of the State Highway 190 bridge (Figure 3). The Frazier Dike levee is mostly bare soil with spotty ruderal vegetation. Current routine maintenance involves periodic removal of herbaceous vegetation. The abutments of the State Highway 190 bridge are currently dominated by wild radish (*Raphanus sativus*), tumbleweed (*Salsola* spp.), and protective riprap. Ten feet of blast rock will be added upslope from the existing riprap to further armor the bridge abutments. Raising the fourteen transmission towers and 11,800 feet of power lines to meet minimum clearance criteria would temporarily impact the existing powerline right of way, which currently cuts through existing and future inundated areas.

The extant population of San Joaquin adobe sunburst at Lake Success is considered in fair condition. It is a remnant population of a larger one that used to occupy an area that is now part of Lake Success. The adobe sunburst successfully blooms during locally high rain years at Lake Success. The local population of the plant is not dependent on the flow regime or pool elevation in the locations it has been found. The Lake Success extant population of adobe sunburst has varied from 50 to over 300 individual plants in four different areas covering an estimated 10-acre area along the west side of Lake Success and Boat Island (Occurrences 10, 19, 46, & 45; Figure 18 and Table 2). In addition, there is a small population on the south side of the inlet where the South Fork of the Tule River enters Lake Success (USFWS 2007). Between April 2 and 4, 2019, a biological survey was conducted between the current and future maximum pool depths at Lake Success. Two new occurrences of adobe sunburst were found; one along the Tule River where it enters Lake Success and the other 800 feet south of Frazier Dike.

Occurrence 46 would be directly impacted by the proposed action since its documented location is directly under where the new road will go (Figure 7). However, this occurrence may no longer be extent since it has not been documented in three past surveys (2016, 2017, & 2019) and was last observed in 2014 (Table 2). Regular grazing by cows and horses on private land and by goats and/or sheep on Corps lands could have eliminated this occurrence. The main stockpile is located near the mapped extent of Occurrence 19. The specific location of the stockpile was moved during project design to avoid this occurrence, which has not been documented since 2006. The stockpile is currently outside a 25-foot buffer zone created around this mapped occurrence. This occurrence has also undergone extensive grazing by horses, cattle, goats, and sheep.

Furthermore, the seedbank may no longer be viable since related plants in the tarweed tribe are reported to have seed that only remain viable up to five years (Montalvo et al. 2010). No known seed viability studies have been conducted on adobe sunburst to date.

Eleven occurrences of San Joaquin kit fox have been documented within 10 miles of the proposed action; kit fox has been documented in the surrounding quads, each greater than 5 miles from the proposed action (CDFW 2019). The last occurrence was documented in 1992. Satellite populations of kit foxes, like those near Lake Success, are prone to extinction (Cypher et al. 2014). Furthermore, suitable, not preferred, habitat is present in the project area and the project area is at the edge of San Joaquin kit fox's current known range. However, it is possible that kit fox may still use the area for foraging or as a movement corridor. Based on field surveys in December 2018 and February 2019, a multitude of dens were located around the project area; most were last inhabited by ground squirrel, some were recently inhabited by rabbits, and a few had been inhabited by fox (unknown species). An active fox den was located at the base of the right abutment during surveys in February 5, 2019, although the species was not determined as the tracks were only of nail scrapes. The shallow-to-bedrock soils within the project area preclude natal dens since the soils have a maximum depth of 2.9 ft (Soil Survey Staff) and dens are typically located 4.3 ft to almost 10 ft below the soil surface (Egoscue 1956; Morrell 1972; O'Neal et al. 1987).

Orchards occur in large contiguous blocks to the northwest of Lake Success, north of Frazier Dike, and at scattered locations to the southwest (Figures 1 and 5). Orchards sometimes support prey species if the grounds are not manicured; however, denning potential is typically low and kit foxes can be more susceptible to coyote predation within orchards (Zeiner 1990; USFWS 2010; USEPA 2013).

5.2 Cumulative effects

The ESA requires USFWS to evaluate the cumulative effects of the proposed actions on listed species and designated critical habitat, and to consider cumulative effects in formulating Biological Opinions. The ESA defines cumulative effects as "those effects of future State or private actions, not involving Federal activities that are reasonably certain to occur within the action area" of the proposed action subject to consultation. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the Federal ESA. Federal actions, including hatcheries, fisheries, and land management activities are not included.

A number of other commercial and private activities, including agriculture, hatchery operations, timber harvest, recreation, and urban development could potentially affect listed species in the Tule River watershed. Levee maintenance activities by state agencies and local reclamation districts are likely to continue, although any effects on listed species would be addressed through Section 10 of the ESA. The benefit of the Tule River Spillway Enlargement Project's increased storage capacity would be to provide flood damage protection to infrastructure and environments downstream to the Tulare Lakebed by increasing the ability to control the release of high flows, reducing high river flow levee damages, therefore reducing the need for repairs.

6.0 EFFECTS OF THE ACTION

The action area addressed in this BA does not fall within designated critical habitat for any of the species listed in Section 1.1. There is No Effect on designated Critical Habitat.

The immediate effect of blasting is within 750 feet, and secondary effects would be within 2,500 feet, as indicated on Figures 5 and 6. The effects would vary due to the hilly terrain around Lake Success both focusing, reflecting, and attenuating the blast noise. Wildlife sensitive receptors in the immediate blast radius (750 feet) would be considered, although the likelihood of resident wildlife after the soil stripping would be minimal, leaving transient predators such as birds and lizards. Some wildlife in the larger 2,500 foot buffer zone around the demolition may be dissuaded from nesting/denning in the local area if nesting/denning coincides with the rigorous blasting. The nesting habitat available (trees) in the 2,500 foot blast zone is south of the Dam around the Corps Lake Success offices and an abandoned mobile home park. Also, migratory songbirds, raptors, waterbirds and shorebirds may have their migratory patterns shifted due to the disturbance. The frequency and number of detonations is not known at this time, as engineering is still compiling the geotechnical data. Most birds acclimatize quickly to disturbance if they are in a resting or nesting activities, but perching and foraging birds will more often adjust their behavior if the disturbance effects their activity. The disturbance to the animals decreases over repeated exposure if there are no negative effects noticed by the animals. There is energy budget loss due to the disturbance, but it is short term per blast decreasing with successive blasts (Pers. Obs. and Holthuijzen, et al. 1990.)

The increase in the gross pool elevation from 652.5 feet to 662.5 feet as a result of the spillway raise would expose an additional 659 acres of riparian and upland habitat around the lake to periodic inundation during years of well-above average precipitation.

Phase 2 of the project raises the emergency spillway 10 feet with a new ogee weir. This will reduce the 100-year flood flow through the spillway from approximately 4,700 cfs to 3,200 cfs (Appendix C). Since the downstream Tule River channel capacity immediately east and west of Hwy 99 ranges from 2,000 cfs to 1,000 cfs, respectively, flooding in these areas would still occur (Figures 12-14). Based on hydraulic modeling, no impacts to downstream habitat or wetlands would occur and the average change in water level during major floods across the Tulare Lakebed would be a reduction of only 0.001 inches (Appendix C). Thus the proposed action would have no effect on downstream listed species.

The spillway raise in Phase 2 would reduce flooding downstream of the lake along the Tule River floodplain, which is mostly comprised of intensive agriculture (Figure 14). It would also raise the existing potential maximum lake level ten feet, which would increase the area that has the possibility of periodically flooding with lake water (Figures 20 and 21). This could increase the portion of riparian vegetation along the Tule River and South Fork of the Tule River as they enter the lake. The existing 160-acre willow riparian woodland where the Tule River flows into Lake Success currently floods with lake water during wet years with little effect on the black willows, which are very tolerant of flooding. Black willows have an estimated 100 percent survival when inundated up to 60 days (Walters et al. 1980).

San Joaquin Kit Fox

The proposed action **May Affect, and is Likely to Adversely Affect** the San Joaquin kit fox due to indirect effects. Directly there are minimal permanent impacts from the project on biologically significant habitats since the project area only contains a minor amount of marginal habitat. Additionally, kit foxes have not been documented within 5 miles of the project area, the soils in the project area preclude the creation of natal dens, and no occurrences of kit foxes have been documented within 10 miles of the project area since 1992. If there are isolated kit foxes foraging in the area, the project actions may result in short term avoidance due to construction and blasting. Furthermore, the BMPs (both pre-construction surveys and avoidance and minimization measures) would avoid, minimize, or reduce potential interactions with kit fox.

The proposed action has the potential to temporarily block foraging habitat for the San Joaquin kit fox during periods of inundation. As a result of the spillway raise, the proposed action would increase the gross pool elevation from 652.5 feet to 662.5 feet, which would expose an estimated additional 659 acres of riparian and upland vegetation around the lake to periodic inundation during years of well-above average precipitation. This represents a permanent periodic loss of potential foraging habitat for kit foxes. The extent of this impact on the kit fox is unknown due to lack of information on species presence and the infrequent nature of such inundation.

Based on the 1999 BO, the Corps would provide compensation for the loss of 421 acres of grassland around the perimeter of the lake, by acquiring and preserving 425 acres of grassland. This grassland would be fenced and managed for wildlife. The Corps would provide compensation for the loss of 167 acres of *Atriplex* grassland habitat, which is now in the Kincade Cove Wildlife Management Area, by planting *Atriplex* community species on 150 acres of lands adjacent to the remaining wildlife management area, above the new gross pool. The area will be fenced to protect the plantings from livestock grazing. These lands would not be managed specifically for kit fox habitat, but would provide some kit fox habitat. These compensation requirements could change if the water control manual update indicates a reduced effect on the species habitats from the periodic inundation caused by the proposed spillway raise.

Cumulative effects with other actions. The downstream effects of the spillway enlargement of Lake Success would slightly decrease flooding effects for kit fox in the Tule River and Tulare Lakebed watershed (Figure 22). State and local activities are expected to continue (e.g., levee repairs, water diversions for irrigation). These cumulative effects on the San Joaquin kit fox are difficult to quantify.

Least Bell's Vireo

The proposed action **May Affect, but is Not Likely to Adversely Affect** the least Bell's vireo. All work from the proposed action would occur more than one-half mile from potential habitat for this species (Figures 3 and 15). Since this habitat is already within the existing gross pool of the lake, the periodic higher lake levels caused by the proposed action beyond the existing gross pool would not impact the habitat beyond current conditions. There is a chance that more habitat would be created (Figures 20 and 21) with higher lake levels. However, since the frequency of high water events is less than one percent each year, it is difficult to determine these beneficial

impacts. The suitable habitat for least Bell's vireo at Lake Success is more than 10,000 feet from the blasting. Blasting would occur after the nesting season for least Bell's vireo has ended in July and would cease before it begins again in April (Kus 2002). Thus the Corps expects there to be minimal impacts on least Bell's vireo from blasting.

Southwestern Willow Flycatcher

The proposed action **May Affect, but is Not Likely to Adversely Affect** the southwestern willow flycatcher. All work from the proposed action would occur more than one-half mile from potential habitat for this species (Figures 3 and 15). Since this habitat is already within the existing gross pool of the lake, the periodic higher lake levels caused by the proposed action beyond the existing gross pool will not impact the habitat beyond current conditions. There is a chance that more habitat would be created (Figures 20 and 21) with higher lake levels. However, since the frequency of high water events is less than one percent each year, it is difficult to determine these beneficial impacts. The suitable habitat for southwestern willow flycatcher at Lake Success is more than 10,000 feet from the blasting. Blasting would occur after the species typically departs in summer and would cease before the species returned in last spring (Sogge 1997b; USFWS 2013). Thus the Corps expects there to be minimal impacts on southwestern willow flycatcher from blasting.

San Joaquin Adobe Sunburst

For Phase 1, the proposed action **May Affect, and is Likely to Adversely Affect** San Joaquin adobe sunburst. Although this annual species has not been documented within the construction footprint since 2014 and mitigation measures will be taken if plants are found during final pre-construction surveys in spring 2020, the new road alignment will destroy known habitat for this species.

The project actions may directly harm one occurrence of San Joaquin adobe sunburst (number 46, Figure 18 and Table 2), which has potentially already been eliminated by grazing. This occurrence was known to occur where the new road will be located. Further occurrences, not in the California Natural Diversity Database or IPaC, were discovered on April 2-4, 2019. One occurrence is two miles from the project area along the Tule River before it enters Lake Success. This occurrence is above the new projected gross pool and would not be directly or indirectly impacted by the project. The other occurrence is 800 feet south of Frazier Dike. It is away from any proposed haul routes (>250 ft) and the power lines transmission towers (>2500 ft). Based on elevation map contours, there is the potential for part of this occurrence of adobe sunburst to be periodically inundated if wind and wave runup are high enough after the spillway raise occurs, with unknown effects. However, the final designs, wind and wave runup analysis, and elevation surveys for Phase 2 are not complete. If final designs change the affects determination, the Corps would reinitiate consultation with USFWS.

Cumulative effects with other actions. The spillway enlargement might raise the pool to an elevation that would affect San Joaquin adobe sunburst. Based on current understanding, this would occur with a less than 1 percent probability each year and the impacts to this species are unknown. The newly found Frazier Dike population might have been inundated during high lake

levels in 2017. However, more than 1,000 species were seen in 2019. Heavy wind and wave action may cause the pool to shift into the population locations, but the likelihood is low due to the seasonality of severe storms in the area not coinciding with the higher pool levels. State and local activities are expected to continue upstream, while downstream has little to no habitat for this species. State and local activities are expected to continue (e.g., levee repairs, water diversions for irrigation), but these populations are on Federal land and would not be affected by non-Federal actions.

7.0 CONCLUSION

The proposed action May Affect, but is Not Likely to Adversely Affect both the least Bell's vireo and the southwestern willow flycatcher. All work from the proposed action would occur more than one-half mile from potential habitat for these two species. This habitat currently floods during wet years and the frequency of such flooding would not be impacted by the proposed action. A minimal amount of additional riparian habitat could be created by the project.

The indirect effects of the increase in gross pool elevation would periodically deprive any potential area kit foxes of foraging habitat. As a result, this project May Affect, and is Likely to Adversely Affect the San Joaquin kit fox. The downstream effects of the spillway enlargement of Lake Success would decrease flooding effects for kit fox in the Tulare Lakebed watershed. State and local activities are expected to continue (e.g., levee repairs, water diversions for irrigation).

The spillway enlargement is not likely to raise the pool to an elevation that would affect San Joaquin adobe sunburst. Heavy wind and wave action may cause the pool to shift into the population locations, but the likelihood is low due to the seasonality of severe storms in the area not coinciding with the higher pool levels. State and local activities are expected to continue upstream (e.g., levee repairs, water diversions for irrigation), while downstream has little to no habitat for this species. These populations are on Federal land and would not be effected by non-Federal actions. As the species cannot avoid environmental changes, this project May Affect, and is Likely to Adversely Affect San Joaquin adobe sunburst populations.

8.0 LITERATURE CITED

[AOU] American Ornithologists' Union. 1957. Check-list of North American birds. 5th edition. Port City Press, Inc. Baltimore, Md.

Archon M. 1992. Ecology of the San Joaquin kit fox in western Merced County, California [thesis]. California State University, Fresno, California. 62 pp.

Arjo WM, Bennett TJ, Kozlowski AJ. 2003. Characteristics of current and historical kit fox (*Vulpes macrotis*) dens in the Great Basin Desert. USDA National Wildlife Research Center - Staff Publications. Paper 192.

Bell HM. 1994. Analysis of habitat characteristics of San Joaquin kit fox in its northern range [thesis]. California State University, Hayward, California.

Bombay HL. 1999. Scale perspectives in habitat selection and reproductive success for willow flycatchers (*Empidonax traillii*) in the central Sierra Nevada, California [thesis]. California State University, Sacramento. 225 pp.

Bombay HL, Benson TM, Valentine BE, Stefani RA. 2003. A Willow Flycatcher Survey Protocol for California. 57 pp.

Brown BT. 1993. Bell's Vireo (*Vireo bellii*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology.

[CDFG] California Department of Fish and Game. 1992. Annual report on the status of California state-listed threatened and endangered animals and plants. State of California, Department of Fish and Game, Sacramento, California.

[CDFG] California Department of Fish and Game. 2001. The status of rare, threatened, and endangered animals and plants of California. Annual Rep. for 2000. 225 pp.

[CDFW] California Department of Fish and Wildlife. 2019. California Natural Diversity Database (CNDDB), Rarefind electronic database. Internet address: www.dfg.ca.gov/bdh/html/rarefind.html.

California Department of Forestry and Fire Protection. 1988. California's Forests and Rangelands: growing conflict over changing uses. Forest and Rangeland Resources Assessment Program, Sacramento, California. 348 pp.

[Corps] U.S. Army Corps of Engineers. 1999. Final Environmental Impact Statement/Draft Environmental Impact Report for Tule River Basin Investigation.

[Corps] U.S. Army Corps of Engineers. 2011. Success Dam Seismic Remediation San Joaquin Valley, California: Floodplain Mapping Study for Economic Analysis.

[Corps] U.S. Army Corps of Engineers. 2019. Success Dam, Tule River Basin, California; Tule River Spillway Enlargement Project, Draft Environmental Assessment for the Road Realignment and Right Abutment Spillway Cut.

Cypher BL. 2000. Effects of roads on San Joaquin kit foxes: a review and synthesis of existing data. Endangered Species recovery Program, Fresno, California, 59 pp.

Cypher BL, Koopman ME, McCullough DR. 2001. Space use and movements by kit fox family members. Transactions of the Western Section of The Wildlife Society 37:84-87.

Cypher BL, Westall TL, Van Horn Job CL, Kelly EC. 2014. San Joaquin Kit Fox conservation in a satellite habitat area. California State University, Stanislaus, Endangered Species Recovery Program, Turlock, CA.

Daw S. 2013. Southwestern Willow Flycatcher. National Park Service (NPS) Southern Colorado Plateau Network I&M Program. Available from www.nps.gov/articles/southwestern-willowflycatcher.htm

Egoscue HJ. 1956. Preliminary studies of the kit fox in Utah. J. Mammal. 37:351-357.

Egoscue HJ. 1962. Ecology and life history of the kit fox in Tooele County, Utah. Ecology 43:481-497.

Franzreb KE. 1989. Ecology and conservation of the endangered least Bell's vireo. U.S. Fish and Wildlife Service, Biol. Rep. 89(1). 17 pp.

Friedmann H. 1963. Host relations of the parasitic cowbirds. U. S. National Museum Bulletin 223:1-276.

Gaines D. 1974. A new look at the nesting riparian avifauna of the Sacramento Valley, California. Western Birds: 5:61-79.

Garrett K, Dunn J. 1981. The birds of southern California: status and distribution. Los Angeles Audubon Society. 408 pp.

Goldwasser S, Gaines D, Wilbur S. 1980. The least Bell's vireo in California: a de facto endangered race. Am. Birds 34:742-745.

Goodridge J. 1996. Data on California's Extreme Rainfall from 1862-1995. 1996 California Weather Symposium, Sierra College, Rocklin, CA.

Grinnell J, Dixon JS, Linsdale JM. 1937. Fur-bearing mammals of California. Vol. 2. Univ. of California Press, Berkeley, CA.

Grinnell J, Miller A. 1944. The distribution of the birds of California. Pacific Coast Avifauna No. 26.

Holthuijzen AMA, Eastland WG, Ansell AR, Kochert MN, Williams RD, and Young LS. 1990. Effects of blasting on behavior and productivity of nesting prairie falcons. Wildlife Society Bulletin 18:270-281.

Jensen CC. 1972. San Joaquin kit fox distribution. U.S. Fish and Wildlife Service, Sacramento, California, Unpubl. Rep. 18 pp.

Johnson DE. 2012. *Pseudobahia peirsonii*, in Jepson Flora Project (eds.) Jepson eFlora, http://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=4493, accessed on November 08, 2019.

Johnson RR, Haight LT. 1984. Riparian problems and initiatives in the American Southwest: a regional perspective. Pp. 404-412 in California riparian systems: ecology, conservation, and productive management (R. E. Warner and K. M. Hendrix, eds.)University of California Press, Berkeley. 1035 pp.

Johnson RR, Haight LT, Simpson JM. 1987. Endangered habitats versus endangered species: a management challenge. Western Birds 18:89-96.

Katibah EF. 1984. A brief history of riparian forests in the Central Valley of California. Pp. 23-29 in California riparian systems: ecology, conservation, and productive management (R. E Warner and K. M. Hendrix, eds.). University of California Press, Berkeley. 1034 pp.

Klebenow DA, Oakleaf RJ. 1984. Historical avifaunal changes in the riparian zone of the Truckee River, Nevada. Pages 203–209 in Warner RE, Hendrix KM, eds. California Riparian Systems: Ecology, Conservation and Productive Management. Berkeley: University of California Press.

Koopman ME, Scrivner JH, Kato TT. 1998. Patterns of den use by San Joaquin kit foxes. Journal of Wildlife Management 62:373-379.

Kus B. 2002. Least Bell's Vireo (*Vireo bellii pusillus*). In The Riparian Bird Conservation Plan: a strategy for reversing the decline of riparian-associated birds in California. California Partners in Flight. Available from http://www.prbo.org/calpif/htmldocs/riparian_v-2.html

Lande R 1988. Genetics and demography in biological conservation. Science 241:1455-1460.

Laughrin L. 1970. San Joaquin kit fox: its distribution and abundance. California Dept. Fish and Game, Sacramento, CA. Wildlife Management Branch, Admin. Rep. No. 70-2. 20 pp.

McCabe RA. 1991. The little green bird: ecology of the willow flycatcher. Palmer Publications, Inc., Amherst, Wisconsin. 171 pp.

Montalvo AM, Goode LH, Beyers JL. 2010. Plant Profile for Deinandra fasciculata. Native Plant Recommendations for Southern California Ecoregions. Riverside-Corona Resource Conservation District and U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station, Riverside, CA. Available from: http://www.rcrcd.com/index.php?option=com_content&view=article&id=88&Itemid=190.

Morrell SH. 1972. Life history of the San Joaquin kit fox. California Department of Fish and Game 58:162-174.

Morrison ML, Hall LS, Bombay H, Cain J. 1999. 1999 Annual report for the challenge cost-share agreement between California State University, Sacramento and USDA Forest Service, Tahoe National Forest regarding willow flycatcher survey and monitoring. December 17, 1999.

NatureServe. 2019. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available from http://explorer.natureserve.org. (Accessed: November 8, 2019).

Netter MR, Paxton EH, Sogge MK. 1998. Banding and Movements of southwestern willow flycatcher at Roosevelt Lake and San Pedro River/Gila River Confluence, Arizona -1998. Ecosystem Science Center, Colorado Plateau Field Station, Flagstaff, AZ.

O'Farrell TP, Kato T, McCue P, Sauls ML. 1980. Inventory of San Joaquin kit fox on Bureau of Land Management lands in southern and southwestern San Joaquin Valley Final Report. EG&G, U.S. Department of Energy, Goleta, California. EGG 1183-2400.

O'Farrell TP, McCue P. 1981. Inventory of San Joaquin kit fox on Bureau of Land Management lands in the western San Joaquin Valley. Final report. EG&G. U.S. Department of Energy, Goleta, California. EGG 1183-2416.

O'Farrell TP. 1984. Conservation of the endangered San Joaquin kit fox (*Vuipes macrotis mutica*) on the Naval Petroleum Reserves, California. Acta Zoologica Finnica 172:207-208.

O'Neal GT, Flinders JT, Clary WP. 1987. Behavioral ecology of the Nevada kit fox (*Vulper macrotis nevadensis*) on a managed desert rangeland. In Current mammalogy. Edited by Genoways. New York: Plenum Press. p 443-481.

Orloff S, Spiegel L, Hall F. 1986. Distribution and habitat requirements of the San Joaquin kit fox in the northern extreme of its range. Trans. Western Section, The Wildlife Society 22:60-70.

Ratliff RD. 1985. Meadows in the Sierra Nevada of California: state of knowledge. USDA Forest Service, Pacific Southwest Forest and Range Experiment Station, Gen. Tech. Report PSW-84.

[RECON] Regional Environmental Consultants. 1989. Comprehensive species management plan for the least Bell's vireo (*Vireo bellii pusillus*). Prepared for San Diego Association of Governments, San Diego.

Reese EA, Sandley WG, Berry WH. 1992. Habitat, soils, and den use of San Joaquin kit fox (*Vulpes velox macrotis*) at Camp Roberts Army National Guard Training Site, California. EG&G. U.S. Department of Energy, Goleta, California. EGG 10617-2156.

Saccheri I, Kuussaari M, Kankare M, Vikman P, Fortelius W, Hanski I. 1998. Inbreeding and extinction in a butterfly population. Nature 392:491-494.

Sanders SD, Flett MA. 1989. Ecology of the Sierra Nevada population of willow flycatcher (*Empidonax traillii*), 1986-1987. California Department of Fish and Game, Wildlife Management Division.

Serena, M. 1982. The status and distribution of the willow flycatcher (*Empidonax traillii*) in selected portions of the Sierra Nevada, 1982. California Department of Fish and Game, Wildlife Management Branch Administrative Report 82-5.

Sferra SJ, Corman TE, Paradzick CE, Rourke JW, Spencer JA, Sumner MW. 1997. Arizona Partners in Flight southwestern willow flycatcher survey: 1993-1996 summary report. Technical Report 113. Arizona Game and Fish Department, Nongame and Endangered Wildlife Program. Phoenix, Arizona. 46 pp.

Sogge MK, Tibbitts TJ. 1994. Distribution and status of the southwestern willow flycatcher along the Colorado River in the Grand Canyon - 1994. Summary report. National Biological Service Colorado Plateau Research Station/Northern Arizona University and U.S. Fish and Wildlife Service, Phoenix. 37 pp.

Sogge MK, Tibbitts TJ, Petterson JR. 1997a. Status and ecology of the southwestern willow flycatcher in the Grand Canyon. Western Birds 28:142-157.

Sogge MK, Marshall RM, Sferra SJ, Tibbitts TJ. 1997b. A southwestern willow flycatcher natural history summary and survey protocol. Colorado Plateau Research Station, Northern Arizona University: Flagstaff, Arizona. National Park Service Technical Report USGS/NAUCPRS/NRTR-97/12.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Accessed 11/07/2019. Available from https://websoilsurvey.sc.egov.usda.gov/

Scott-Graham E. 1994. American Farmland Trust: a proposal for incentive-driven habitat creation and enhancement on farmlands in the San Joaquin Valley under the Federal Endangered Species Act. Draft Rep., Visalia, CA. 34 pp.

Scrivner JH, O'Farrell TP, Kato T. 1987. Dispersal of San Joaquin kit foxes (*Vulpes macrotis mutica*), on Naval Petroleum Reserve #1, Kern County, California. EG&G, Goleta, California. EGG 10282-2190.

Spiegel LK, Cypher BL, Dao TC. 1996. Diet of the San Joaquin kit fox at three sites in western Kern County, California. Pages 39-52 in Spiegel, editor. Studies of the San Joaquin kit fox in undeveloped and oil-developed areas. California Energy Commission, Sacramento.

Spiegel LK, Tom J. 1996. Reproduction of San Joaquin kit fox in undeveloped and oil developed habitats of Kern County, California. Pages 53-69 in Spiegel, editor. Studies of the San Joaquin kit fox in undeveloped and oil-developed areas. California Energy Commission, Sacramento.

Stafford MD, Valentine BE. 1985. A preliminary report on the biology of the willow flycatcher in the central Sierra Nevada. California-Nevada Wildlife Transactions, 66-67.

Stebbins J. 1991. State survey of two plants endemic to the San Joaquin Valley, *Pseudobahia bahiifolia* and *Pseudobahia peirsonii*. Prepared for Jim Bartel, Office of Endangered Species, U.S. Fish and Wildlife Service, Sacramento, California dated January 31, 1991. 88 pp.

Stewart M. 2014. Biological Studies for Routine Operation of Success Dam and Lake: 2014 Habitat Assessment and Survey Results for Southwestern Willow Flycatcher and Least Bell's Vireo at the Tule River Delta Area, Tulare County, California. Unpublished US Army Corps Report.

Taylor DM, Littlefield CD. 1986. Willow flycatcher and yellow warbler response to cattle grazing. American Birds 40:1169-1173.

Unger P, Beyerl T. 2006. Special-status plant survey: Success Dam Seismic Remediation Project. Report to U.S. Army Corps of Engineers. EDAW Inc, Sacramento, CA.

Unger P, Beyerl T. 2008. Identification of Clarkia species at Success Lake. Memorandum, EDAW Inc, Sacramento, CA.

Unitt P. 1987. *Empidonax traillii extimus*: an endangered subspecies. Western Birds 18(3):137-162.

Unsicker JE, White CA, James MR, Kuykendall JD. 1984. Protecting stream environment zones to preserve water quality in the Lake Tahoe Basin. Pp. 808-814 In R.E. Warner and K. Hendrix, (eds.), California riparian systems: ecology, conservation, and productive management. Univ. Calif. Press, Berkeley, CA.

[USEPA] U.S. Environmental Protection Agency. 2013. Endangered Species Facts: San Joaquin Kit Fox (*Vulpes macrotis mutica*). Available from https://www.epa.gov/sites/production/files/2013-08/documents/san-joaquin-kitfox.pdf

[USFWS] U.S. Fish and Wildlife Service. 1967. Endangered Species List – 1967. 32 FR 4001.

[USFWS] U.S. Fish and Wildlife Service. 1983. San Joaquin kit fox recovery plan. Portland, OR. 84 pp.

[USFWS] U.S. Fish and Wildlife Service. 1992. Endangered and threatened wildlife and plants; proposed endangered status for two grassland plants from the Central Valley of California (*Pseudobahia bahiifolia* and *Pseudobahia peirsonii*). Federal Register 57:56549-56555, November 30, 1992.

[USFWS] US Fish and Wildlife Service. 1997. Determination of Endangered Status for *Pseudobahia bahiifolia* (Hartweg's golden sunburst) and Threatened Status for *Pseudobahia peirsonii* (San Joaquin adobe sunburst), Two Grassland Plants from the Central Valley of California. 62 FR 5542.

[USFWS] U.S. Fish and Wildlife Service. 1998a. Final Rule to Determine Endangered or Threatened Status for Six Plants from the Mountains of Southern California. 63 FR 49006.

[USFWS] U.S. Fish and Wildlife Service. 1998b. Recovery Plan for Upland Species of the San Joaquin Valley, California. Region 1, Portland, OR. 139 pp.

[USFWS] U.S. Fish and Wildlife Service. 1998c. Draft recovery plan for the least Bell's vireo. Region 1, Portland, OR. 139 pp.

[USFWS] U.S. Fish and Wildlife Service. 1999a. Formal Section 7 Consultation on the Proposed Permanent 10-foot Dam Elevation Increase at Lake Success in Tulare County, California. 1-1-99-F-0085.

[USFWS] U.S. Fish and Wildlife Service. 1999b. San Joaquin kit fox survey protocol for the Northern Range. Sacramento, CA. 12 pp.

[USFWS] U.S. Fish and Wildlife Service. 2000. Southwestern Willow Flycatcher Protocol Revision. www.fws.gov/pacific/

[USFWS] U.S. Fish and Wildlife Service. 2001. Least Bell's Vireo Survey Guidelines. Ecological Services, Carlsbad Fish and Wildlife Office, Carlsbad, CA.

[USFWS] U.S. Fish and Wildlife Service. 2007. *Pseudobahia bahiifolia* (Hartweg's golden sunburst) *Pseudobahia peirsonii* (San Joaquin adobe sunburst) 5-Year Review: Summary and Evaluation. Sacramento, CA. 27 pp.

[USFWS] U.S. Fish and Wildlife Service. 2010. San Joaquin Kit Fox (*Vulpes macrotis mutica*) 5-Year Review: Summary and Evaluation.

[USFWS] U. S. Fish and Wildlife Service. 2011. Standard recommendations for protection of the San Joaquin Kit Fox prior to or during ground disturbance. Sacramento, CA.

[USFWS] U.S. Fish and Wildlife Service. 2013. Southwestern Willow Flycatcher Critical Habitat Revision Question and Answers. Arizona Ecological Services Office. Phoenix, Arizona. www.fws.gov/southwest/es/arizona/

[USFWS] U.S. Fish and Wildlife Service. 2017. Recovery Plan for the Giant Garter Snake (*Thamnophis gigas*). U.S. Fish and Wildlife Service, Pacific Southwest Region, Sacramento, California. vii + 71 pp.

[USFWS] U.S. Fish and Wildlife Service. 2019. Species Profile for Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*). Environmental Conservation Online System (ECOS); [cited 31 October 2019]. Available from https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=I01L

Walters MA, Teskey RO, Hinckley TM. 1980. Impact of water level chances on woody riparian and wetland communities. Volume VII. U.S. Fish and Wildlife Service FWS/OBS 78/93.

Warrick GD, Cypher BL. 1998. Factors affecting the spatial distribution of San Joaquin kit foxes. Journal of Wildlife Management 62:707-717.

Weixelman DA, Zamudio DC, Zamudio KA. 1999. Eastern Sierra Nevada riparian field guide, USDA Forest Service, Intermountain Region, R-4-ECOL-99-01.

White PJ, Ralls K. 1993. Reproduction and spacing patterns of kit foxes relative to changing prey availability. Journal of Wildlife Management 57(4):861–867.

White PJ, Garrott RA. 1997. Factors regulating kit fox populations. Canadian Journal of Zoology 75:1982-1988.

Whitfield, M. J. and C. M. Strong. 1995. A Brown-headed cowbird control program and monitoring for the southwestern willow flycatcher, South Fork Kern River, California. California Department of Fish and Game, Bird and Mammal Conservation Program Report 95-4, Sacramento, California. 17 pp.

Whitfield, M. J. and K. Enos. 1996. A Brown-headed cowbird control program and monitoring for the Southwestern willow flycatcher, South Fork Kern River, California, 1996. Prepared for U. S. Army Corps of Engineers, Sacramento District, and the California Department of Fish and Game.

Whitfield, M. J. and M. K. Sogge. 1999. Range-wide impact of brown-headed cowbird parasitism on the southwestern willow flycatcher (*Empidonax traillii extimus*). Pp.182-190 In M.L. Morrison, L.S. Hall, S.K. Robinson, S.I. Rothstein, D.C. Hahn, T.D. Rich, (eds.), Research and management of the brown-headed cowbird in western landscapes. Studies in Avian Biology No. 18. Cooper Ornith. Soc.

Yard HK, Brown BT. 1999. Willow Flycatcher nest reuse in Arizona. Journal of Field Ornithology 70(2):211-213.

Zeiner DC, Laudenslayer WF, Mayer KE, White M. eds. 1988-1990. California's Wildlife. Vol. I-III. California Department of Fish and Game, Sacramento, California.

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10.0 FIGURES AND TABLES

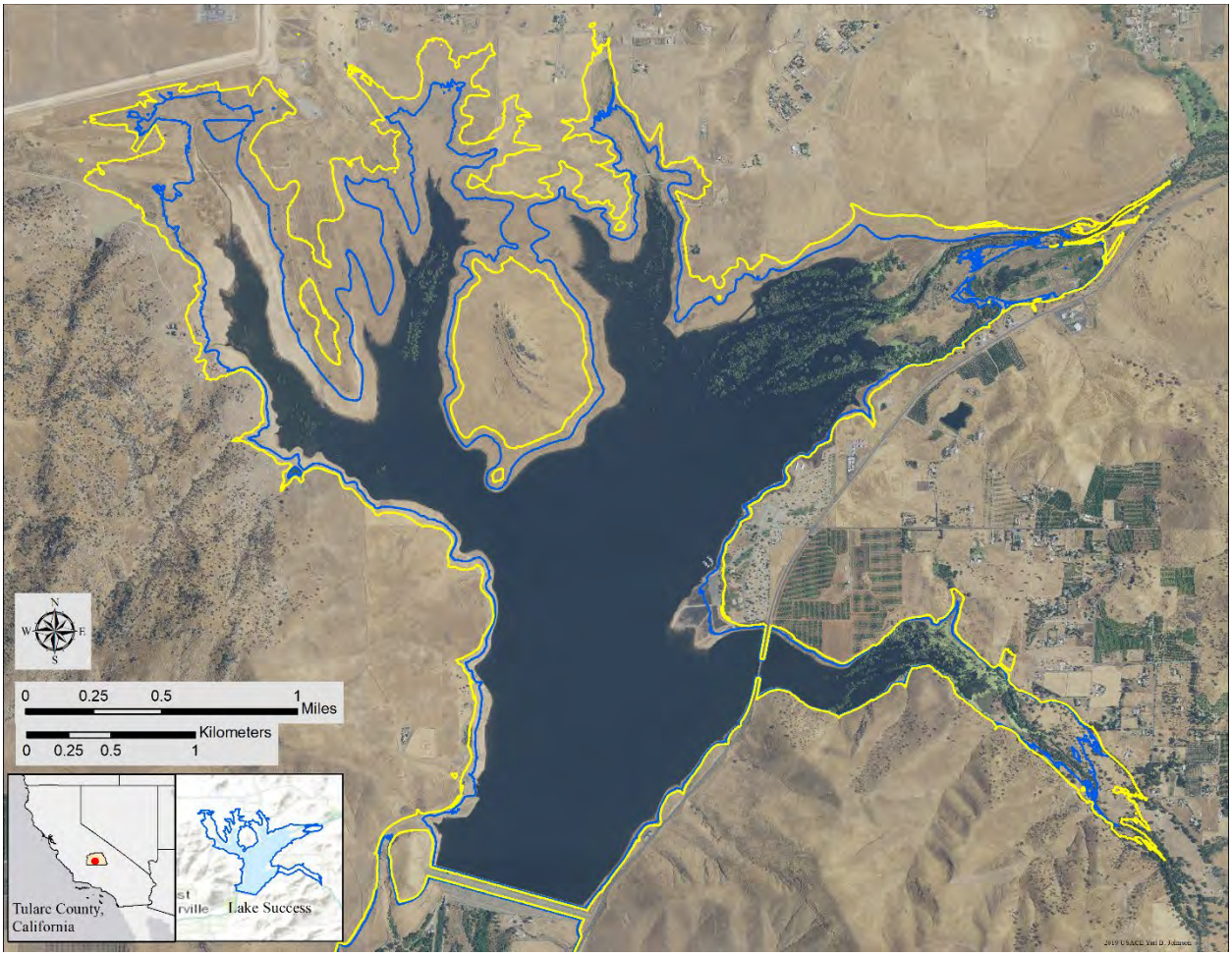

Figure 1. Lake Success with existing potential maximum lake level approximated by the blue contour line (652.5 ft). Proposed potential maximum lake level approximated by the yellow contour line (662.5 ft). The existing maximum lake level has been reached seven times since the dam was constructed in 1961. The Corps estimates that there is a one percent chance each year that the proposed potential maximum lake level will be reached. In other words, the one percent annual chance of exceedance flood ("100-year flood"). Final physical/hydraulic models coupled with LiDAR and on-the-ground surveys will be completed in early 2020 and would give a better estimate of future lake levels.

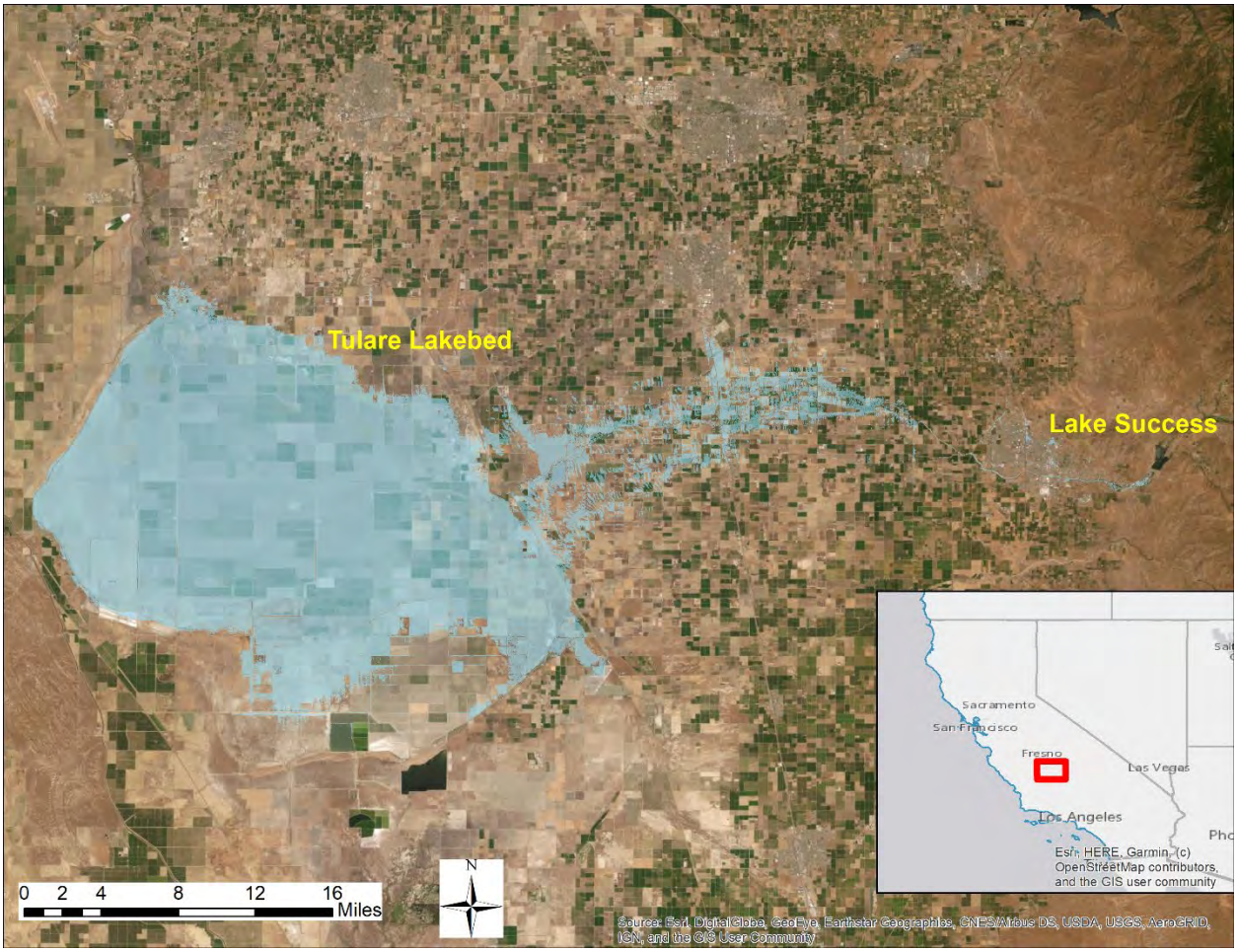

Figure 2. Lake Success with existing downstream 100-year floodplain shown in light blue. Flood area based on modeling, which is detailed in Appendix C. The area in light blue approximates the one percent annual chance of exceedance flood.

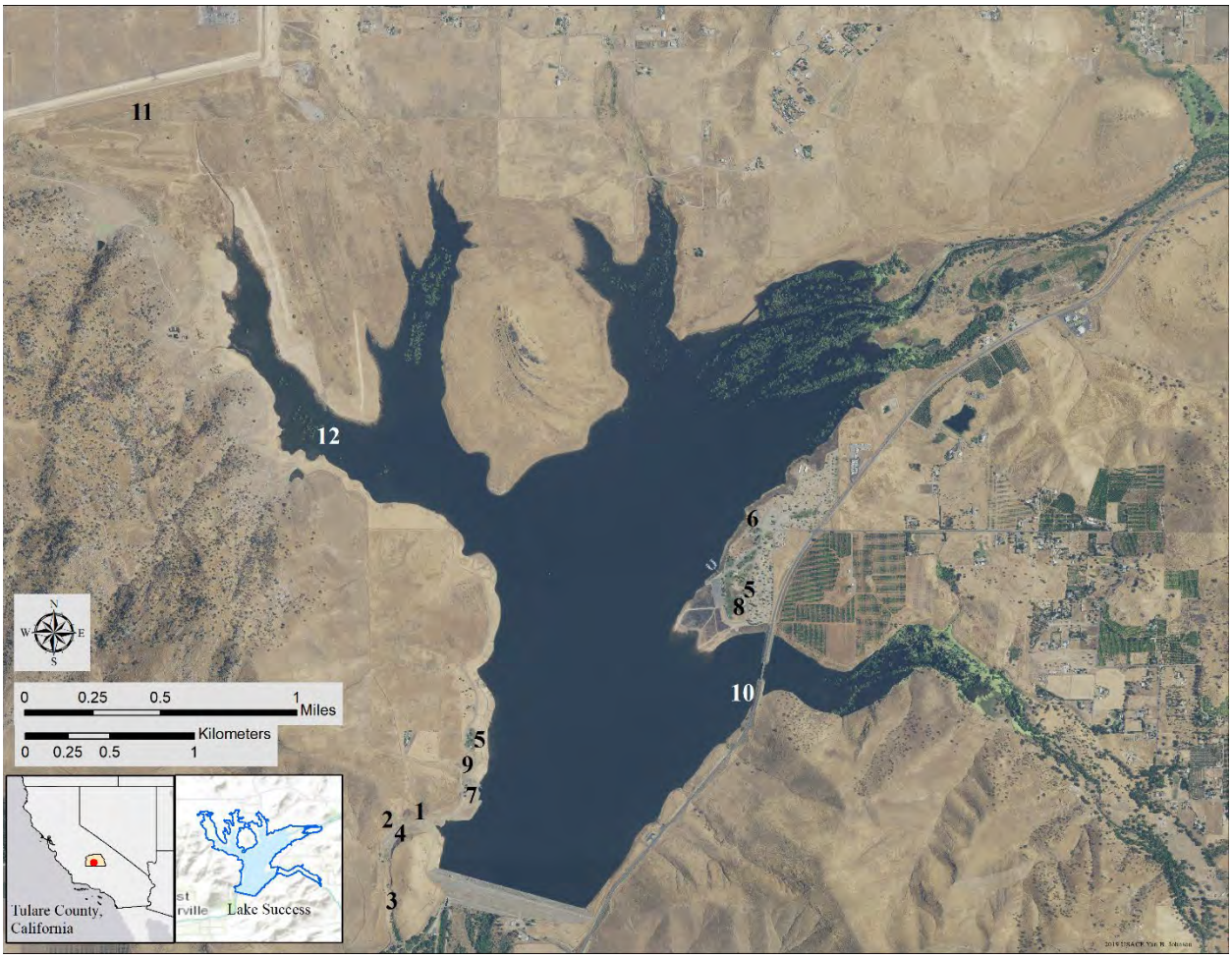

Figure 3. Overview of Lake Success with components of Proposed Action numbered. (1) Widening the spillway sill at Success Dam from 200 feet to 365 feet. (2) Relocating the existing road through the spillway, Worth Drive/Avenue 146, to the new road bench constructed as part of the spillway widening. (3) Restoring the lower third of the spillway to its original design grade using excavated material from the spillway widening. (4) Constructing a 10-foot high concrete ogee weir over the existing spillway sill. (5) Flood-proofing restrooms at the Tule and Rocky Hill recreation areas. (6) Extending and widening the Tule recreation area boat ramp. (7) Enlarging the existing parking area at Rocky Hill recreation are to replace parking areas lost to higher gross pool levels. (8) Protecting in place the Tule recreation area well and storage tank by an earthen berm. (9) Relocating the Rocky Hill recreation area storage tank, well, and metal shed to higher ground. (10) Placing rock revetment along the State Highway 190 bridge abutments for erosion protection. (11) Placing rock revetment (3,500 linear feet) along Frazier Dike for erosion protection. (12) Raising fourteen transmission towers and 11,800 feet of power lines to meet minimum clearance criteria.

Figure 4. Proposed action temporary work area (red outline) along the western shore of Lake Success for Phase 1.

Figure 5. Overview of the emergency spillway on the southwest corner of Lake Success. The spillway will be widened 165 feet by blasting and excavating the right abutment (top side of the spillway in this figure). Worth Drive/Avenue 146 (white line) currently goes through the spillway and will be relocated onto a bench above the new, wider spillway.


Figure 6. View of spillway from Lake Success. Phase 1 involves blasting and excavating the right abutment of the spillway. Worth Drive/Avenue 146 is adjacent to the right abutment.

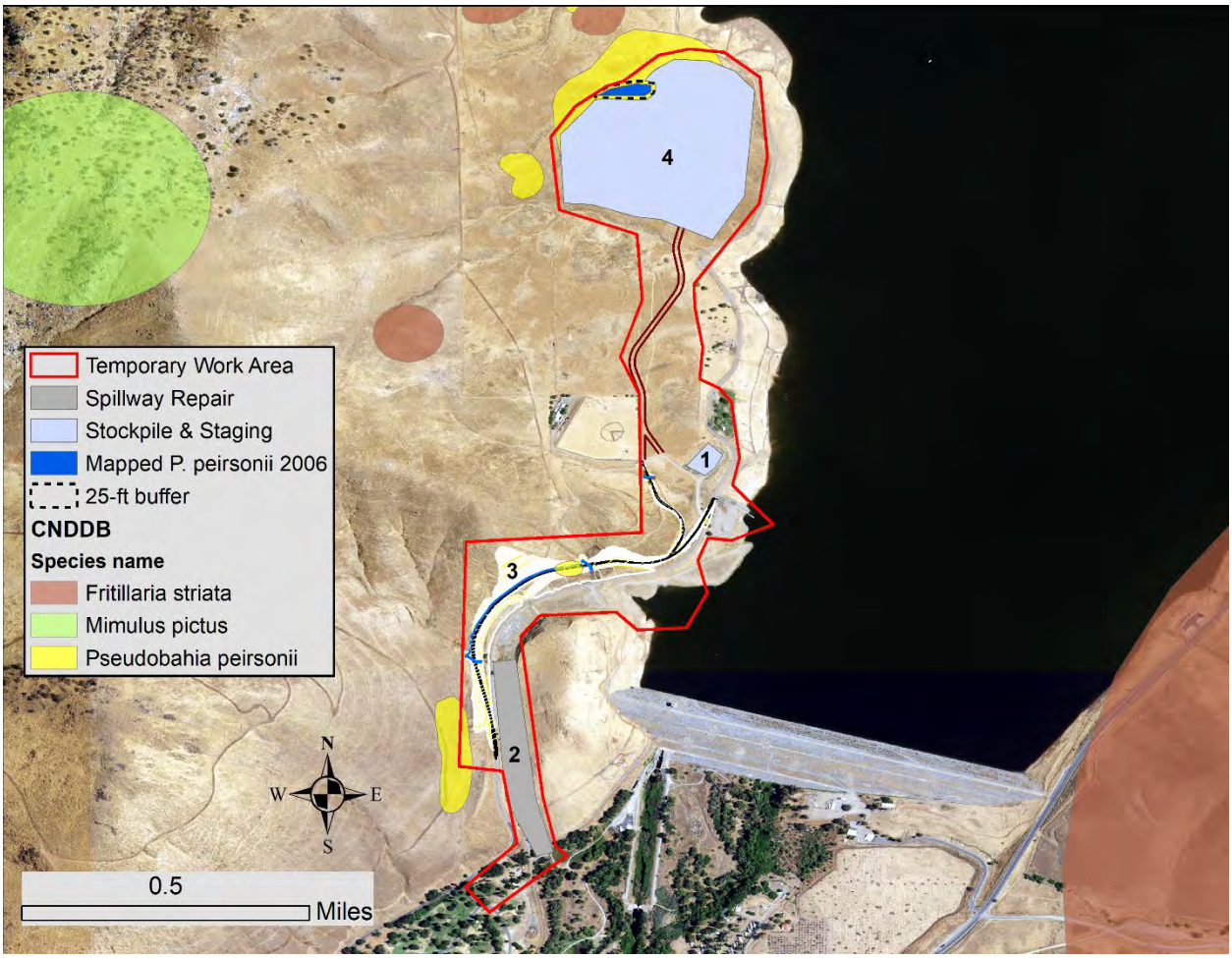

Figure 7. Overview of the proposed action project area for Phase 1 with occurrence of federally-listed species (CDFW 2019). (1) The staging area and construction offices will be located near the Rocky Hill Recreation Area on Corps property. (2) Blast rock from the right abutment cut will be used to repair the emergency spillway grade. (3) Right abutment cut and road realignment (see Figure 9 for a close up of the cut and road realignment). (4) Stockpile location. Stockpile (4) will be located at least 25 feet from the mapped San Joaquin adobe sunburst (*Pseudobahia peirsonii*) locations shown in dark blue. Brown line between 1 and 4 represents a temporary haul road. Striped adobe lily (*Fritillaria striata*) and calico monkeyflower (*Mimulus pictus*) are only shown for informational purposes. They are not impacted by the proposed action from either Phase 1 or Phase 2.

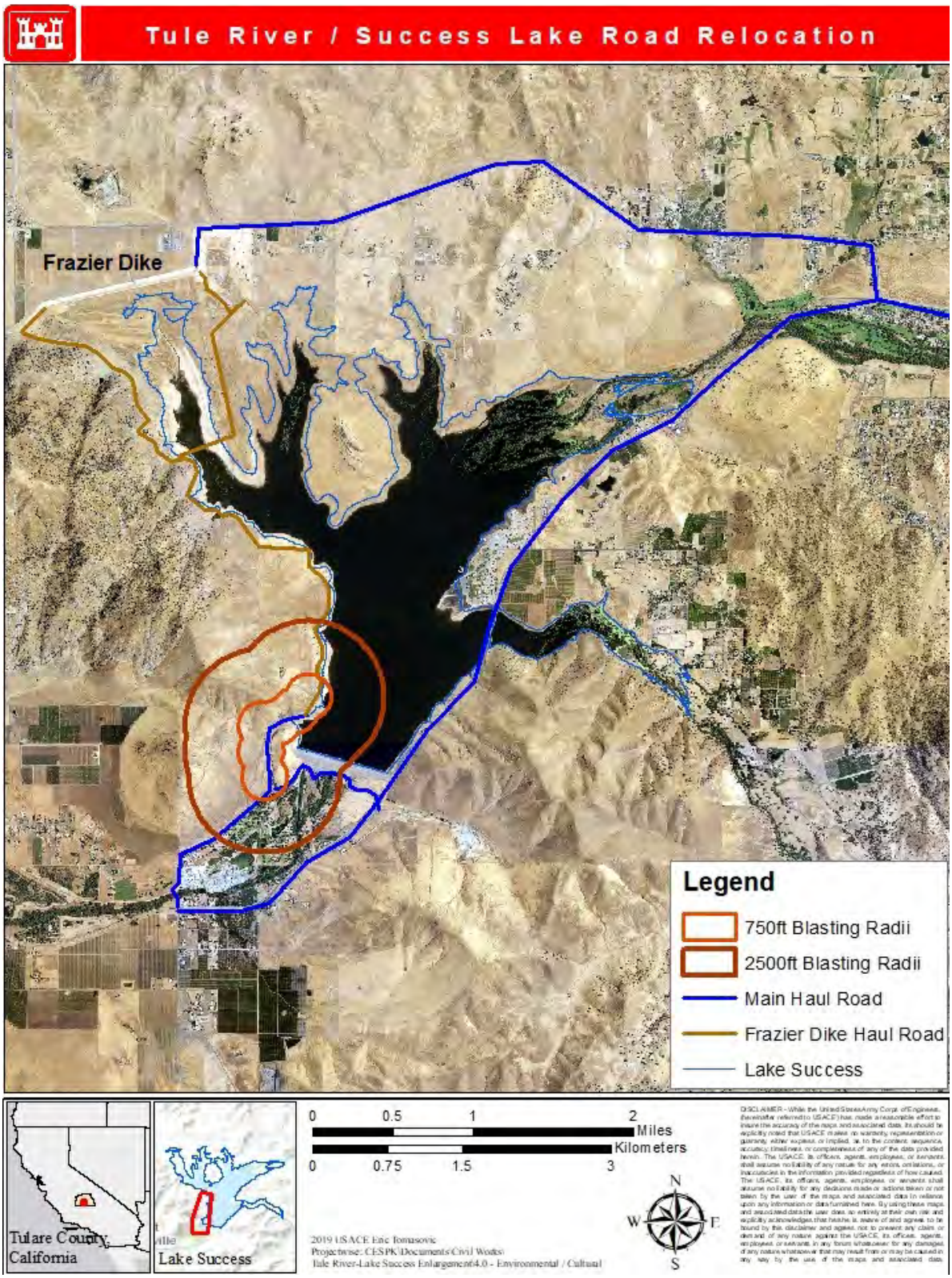

Figure 8. Overview of Lake Success with haul routes and blast radii. The 750ft and 2500ft radii are for safety purposes and do not represent debris fly. Blast debris will typically fly 75-100 feet and will remain within the temporary work area.

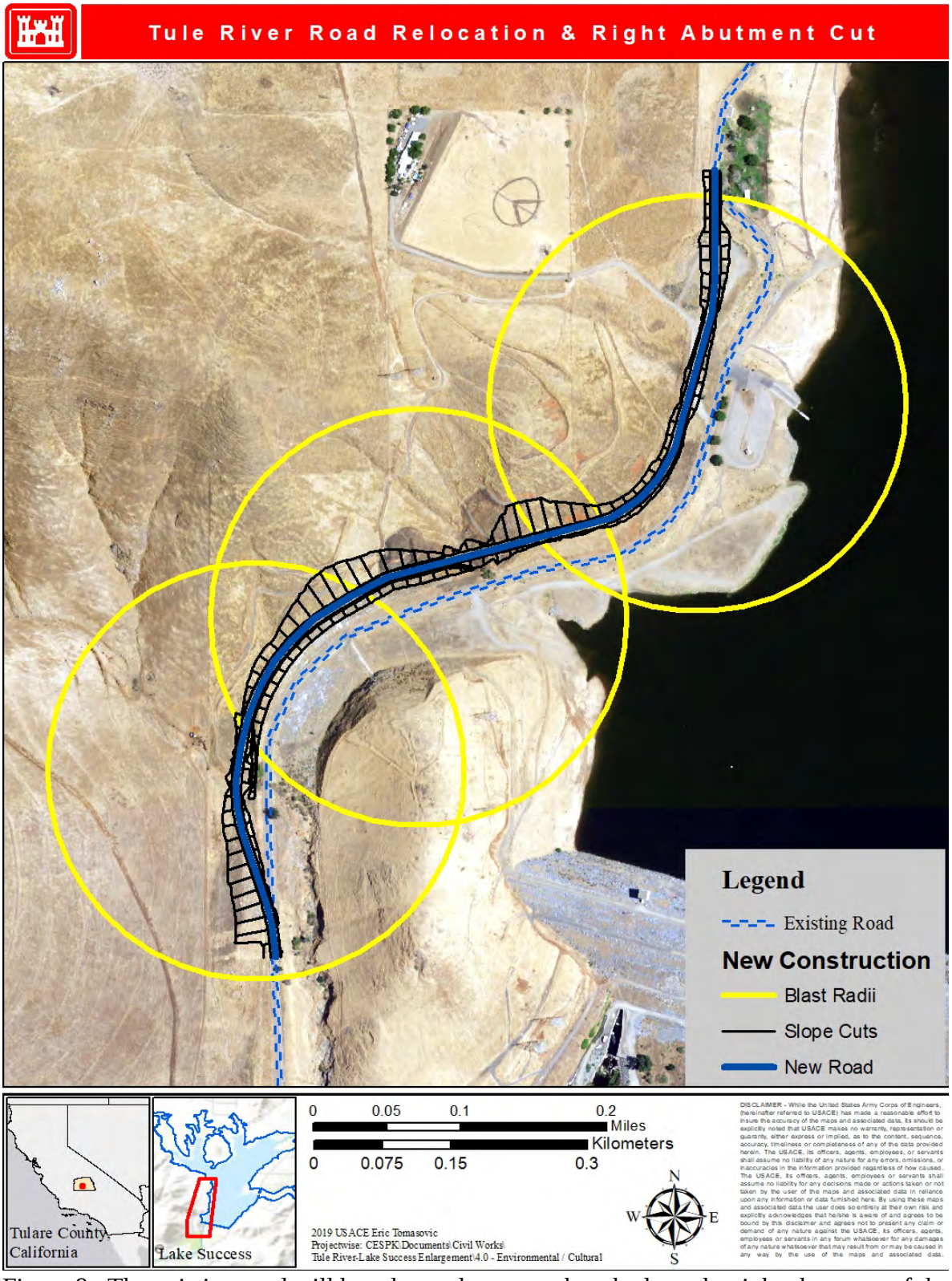

Figure 9. The existing road will be relocated to a new bench along the right abutment of the spillway. The yellow blast radii shown extend 750 feet from the bench and are for safety. Flyrock will not be permitted more than 250 feet from the blastholes along the bend.

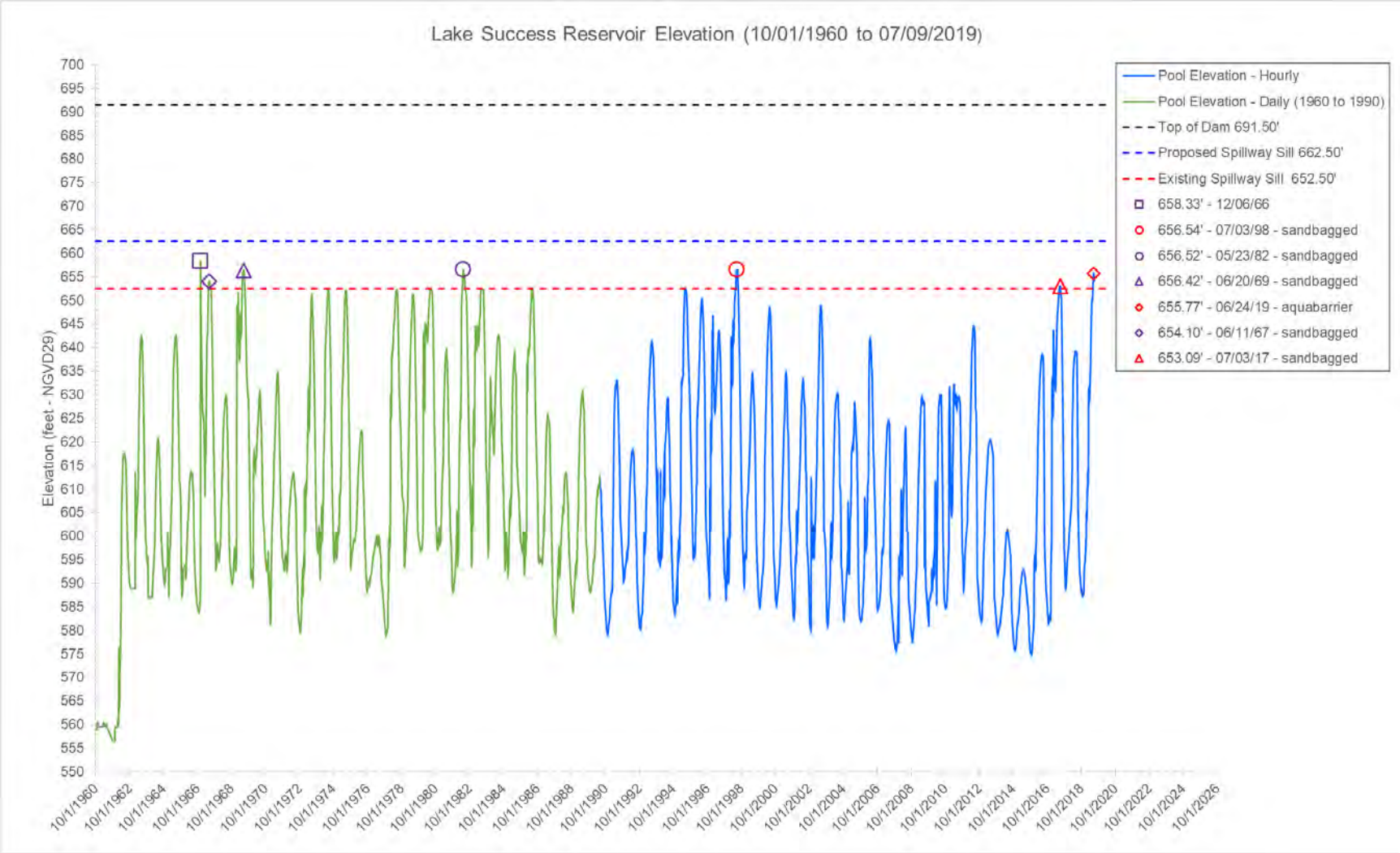

Figure 10. Lake Success reservoir elevation levels over the past 59 years. Red dashed horizontal line represents the current spillway height (652.5 ft), while the blue dashed line represents the proposed spillway height (662.5 ft). After the emergency spillway was first used in December 1966 during flooding, a barrier has been used to prevent high waters from going through the spillway.

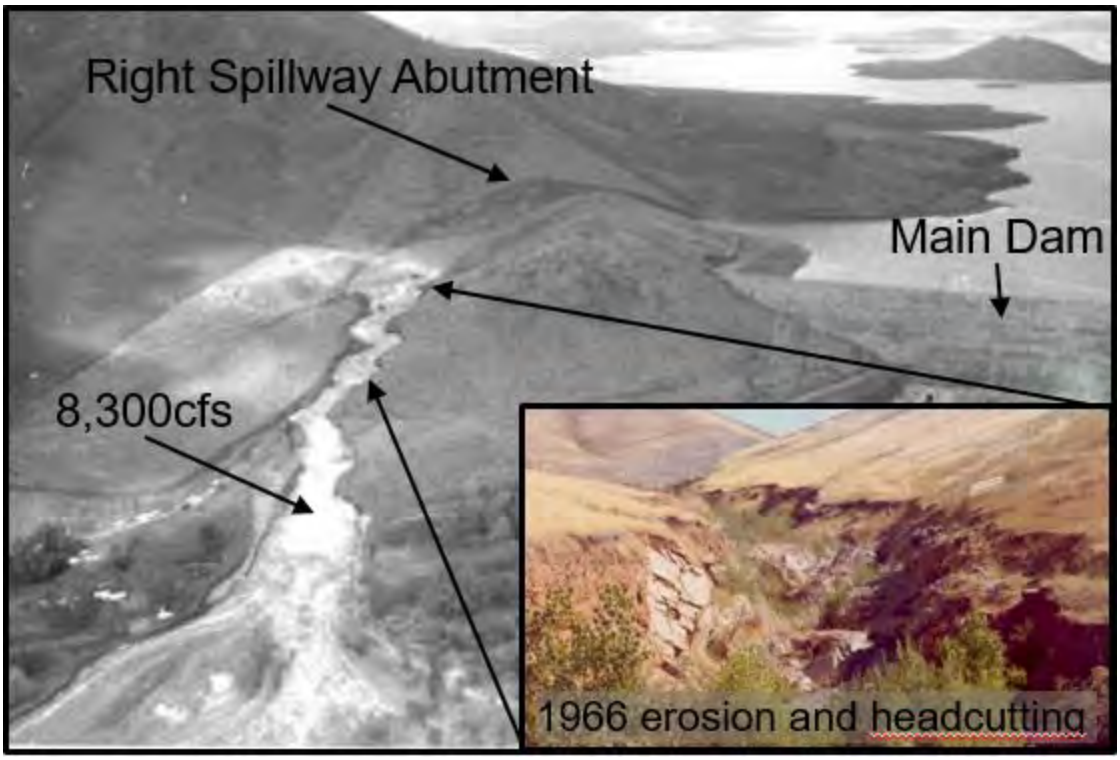

Figure 11. Photo of emergency spillway in December 1966. This was the only time that the spillway has had flowing water. The volume of flow caused erosion and headcutting (see inset) in the lower spillway. Trees started to grow in the newly eroded channel. Since then, the lower spillway has been routinely cleared of vegetation for operations and safety.

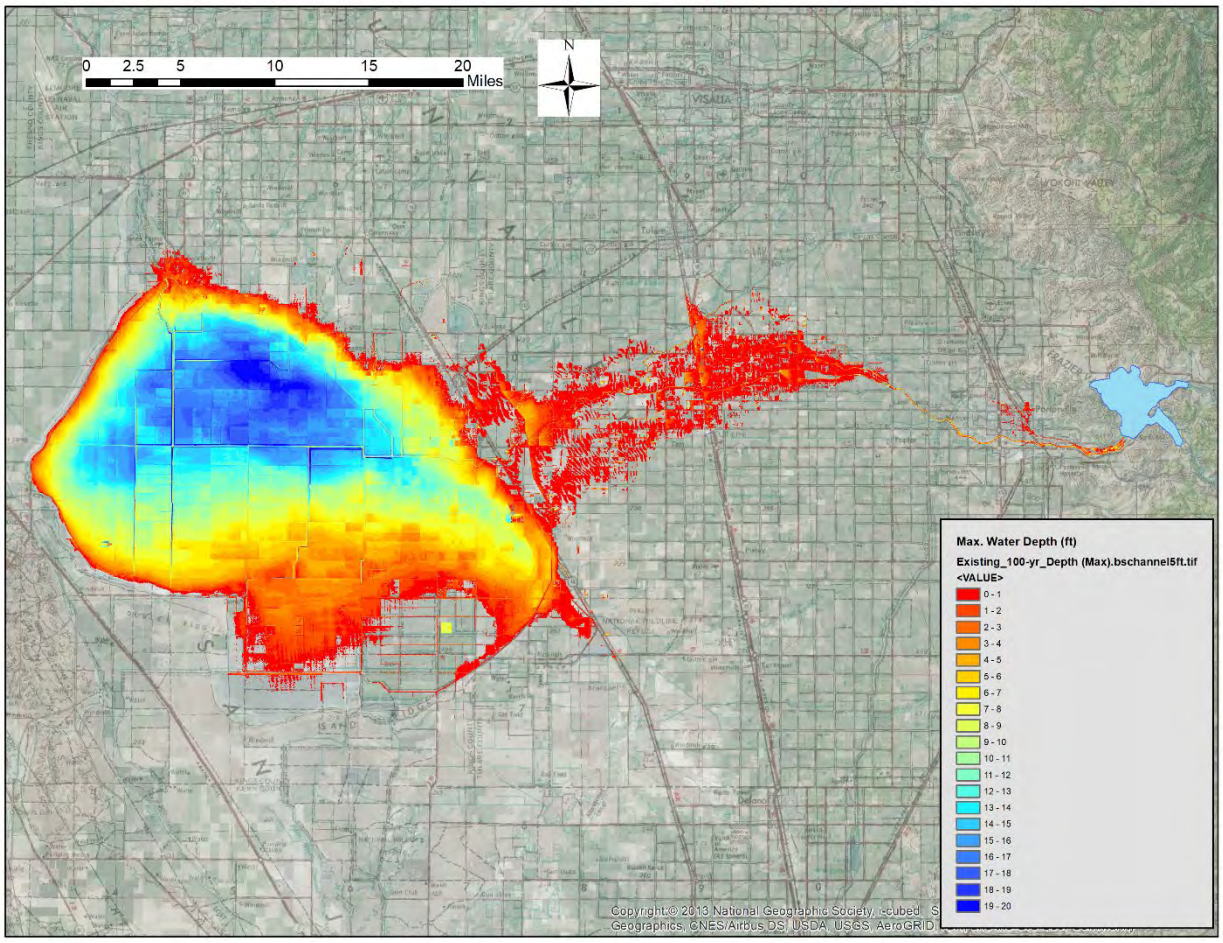

Figure 12. Modeled existing downstream flooding during a 100-year event. Depth in feet. Model based on the physics of water flow (*e.g.*, surface roughness), topography, and hydrology (see Appendix C for details).

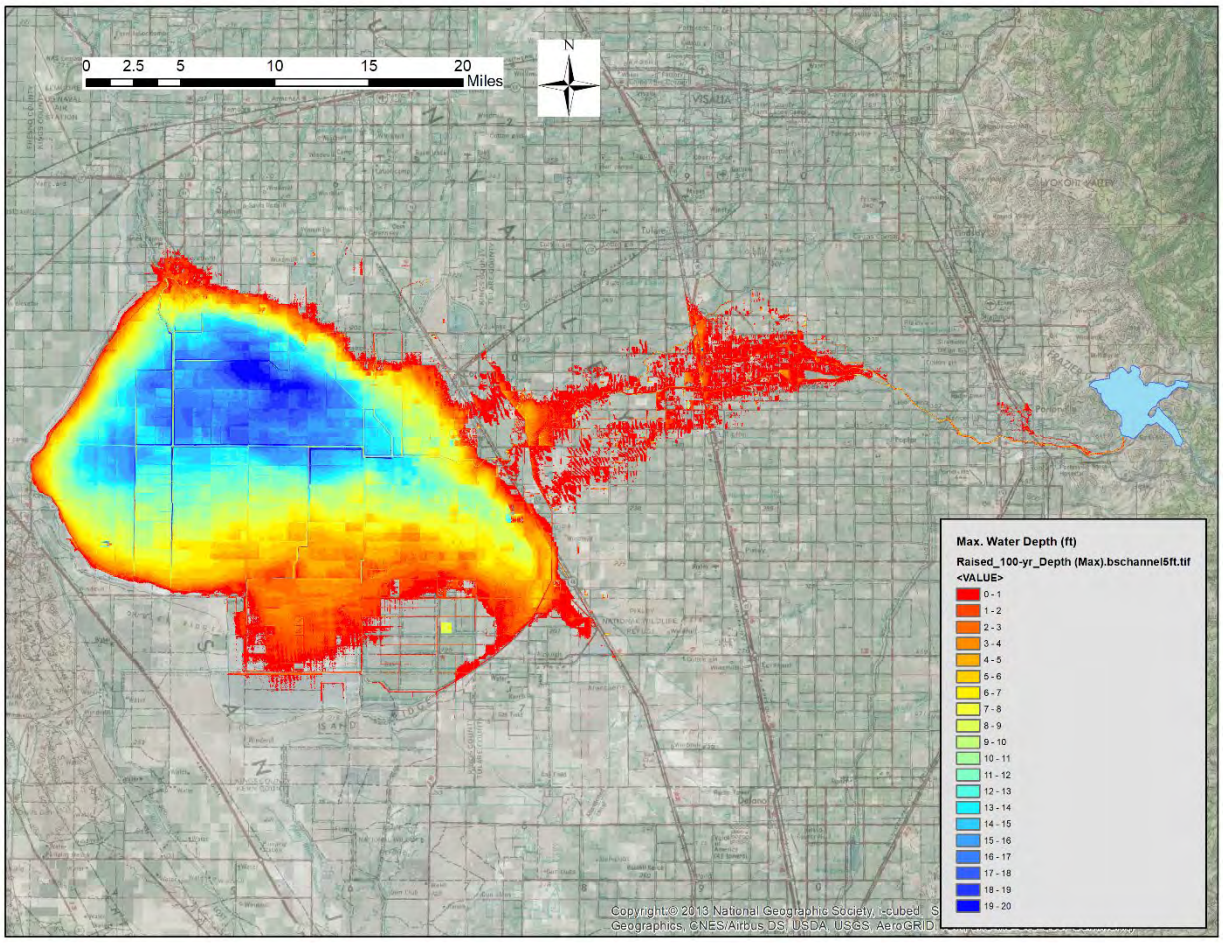

Figure 13. Modeled downstream flooding during a 100-year event after spillway raise. Depth in feet. There is no change in depth or extent of flooding in the Tulare Lakebed. Minor reductions in flooding extent occur in the lower Tule River floodplain over the existing conditions. Greater reductions in flooding extent would occur between the dam and Porterville.

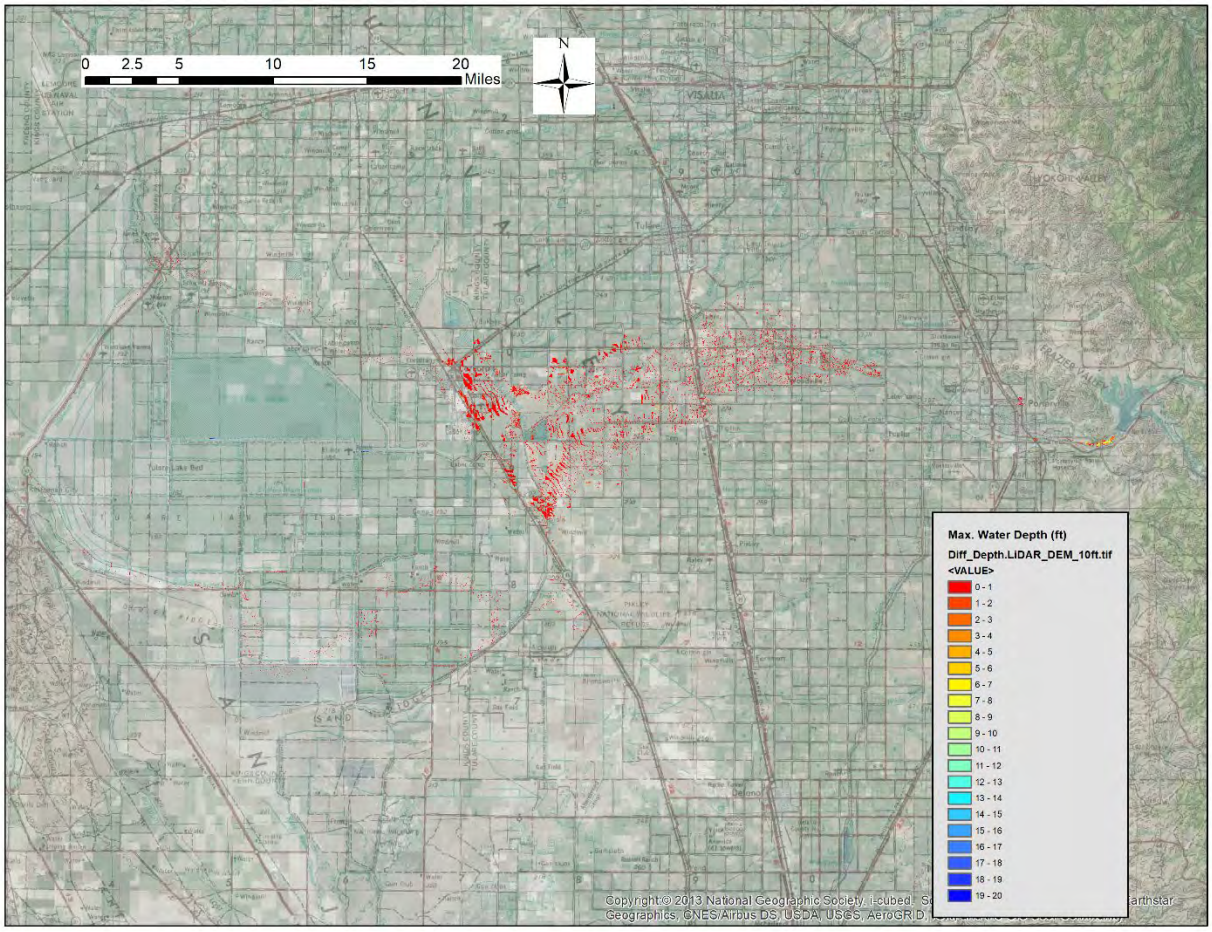

Figure 14. Difference in modeled downstream flooding during a 100-year event. Areas in red and orange are modeled to flood under existing conditions but would not flood after the spillway raise. No difference was observed when comparing existing inundation from 10-year, 20-year, or 50-year floods to inundation after the spillway raise.

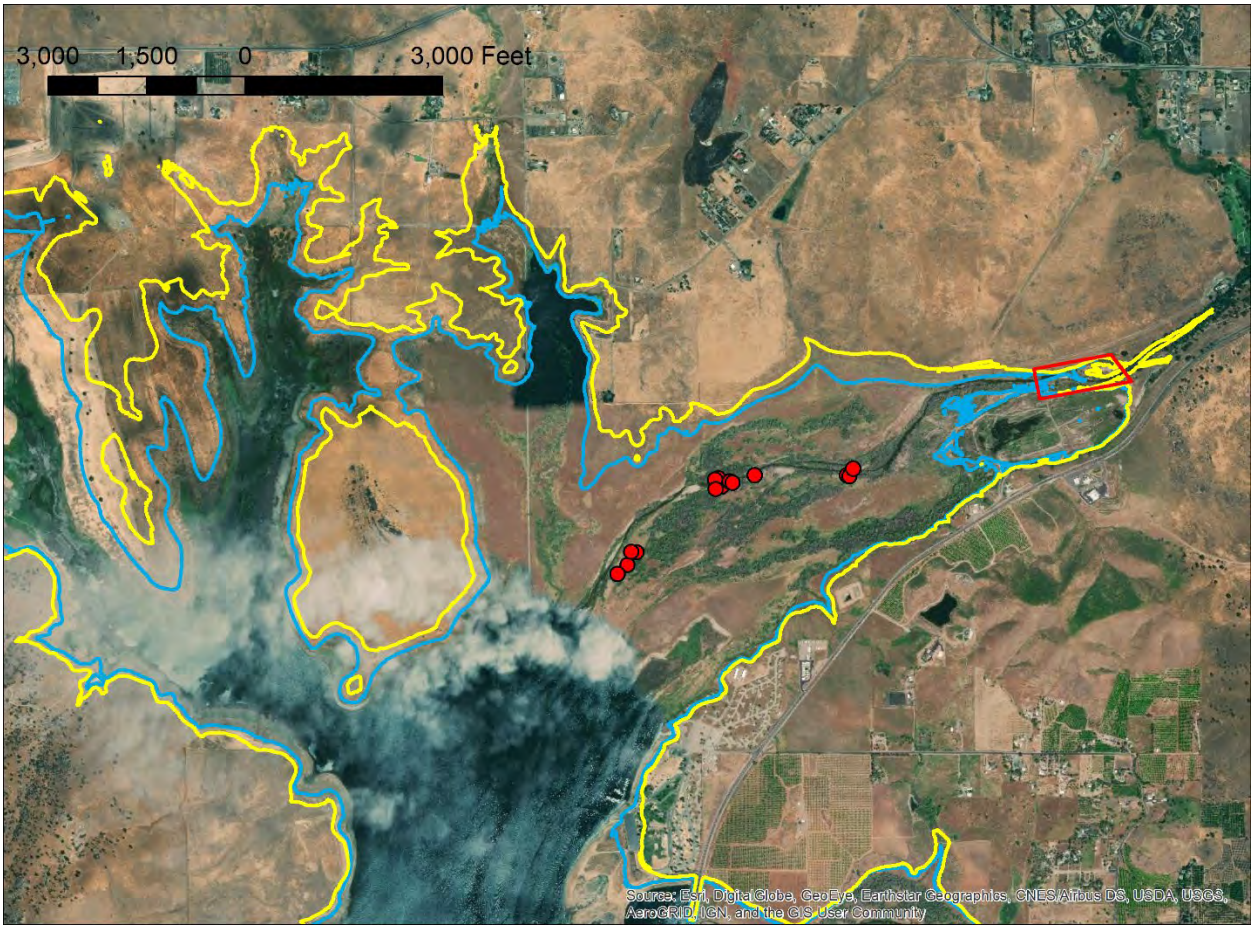

Figure 15. Least Bell's vireo detections (red dots) within the existing gross pool (approximated by the blue line). These detections are from Corps surveys in 2014 along the Tule River and occur within a large expanse of riparian vegetation dominated by willow species, which floods with lake water during most wet years. Based on aerial imagery from 2003-2019, flooding of this area has occurred every year except 2007, 2008, 2012, and 2014. The proposed action would raise the existing gross pool 10 feet (approximated by the yellow line) with potential effects on riparian areas (denoted with red polygon) about 3000 ft from the detections. A detailed map of the area denoted by the red polygon is shown in Figure 20.

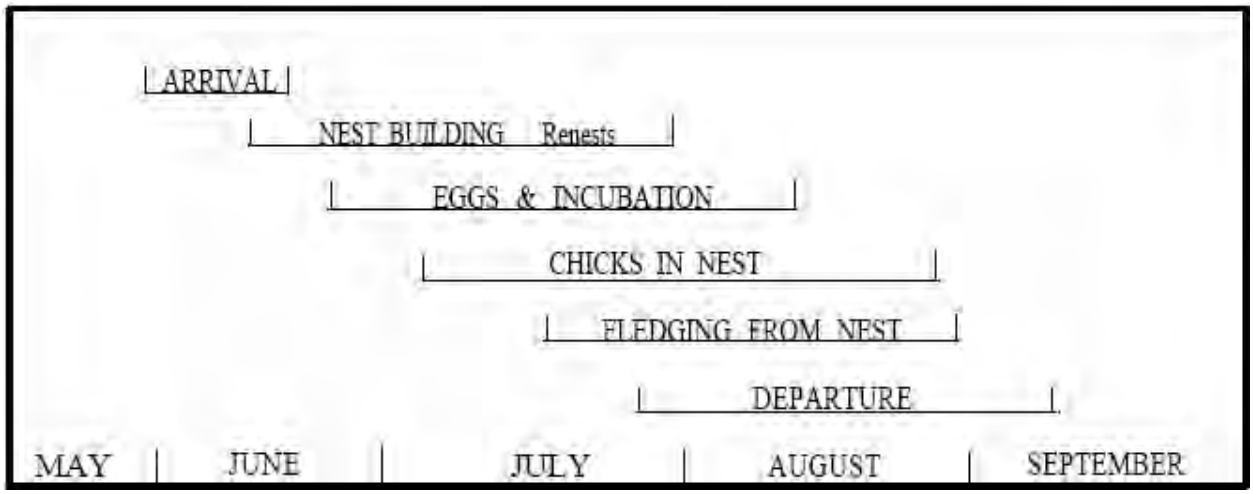

Figure 16. Generalized willow flycatcher breeding chronology for Central and Northern California (adapted from Sogge et al. 1997b).

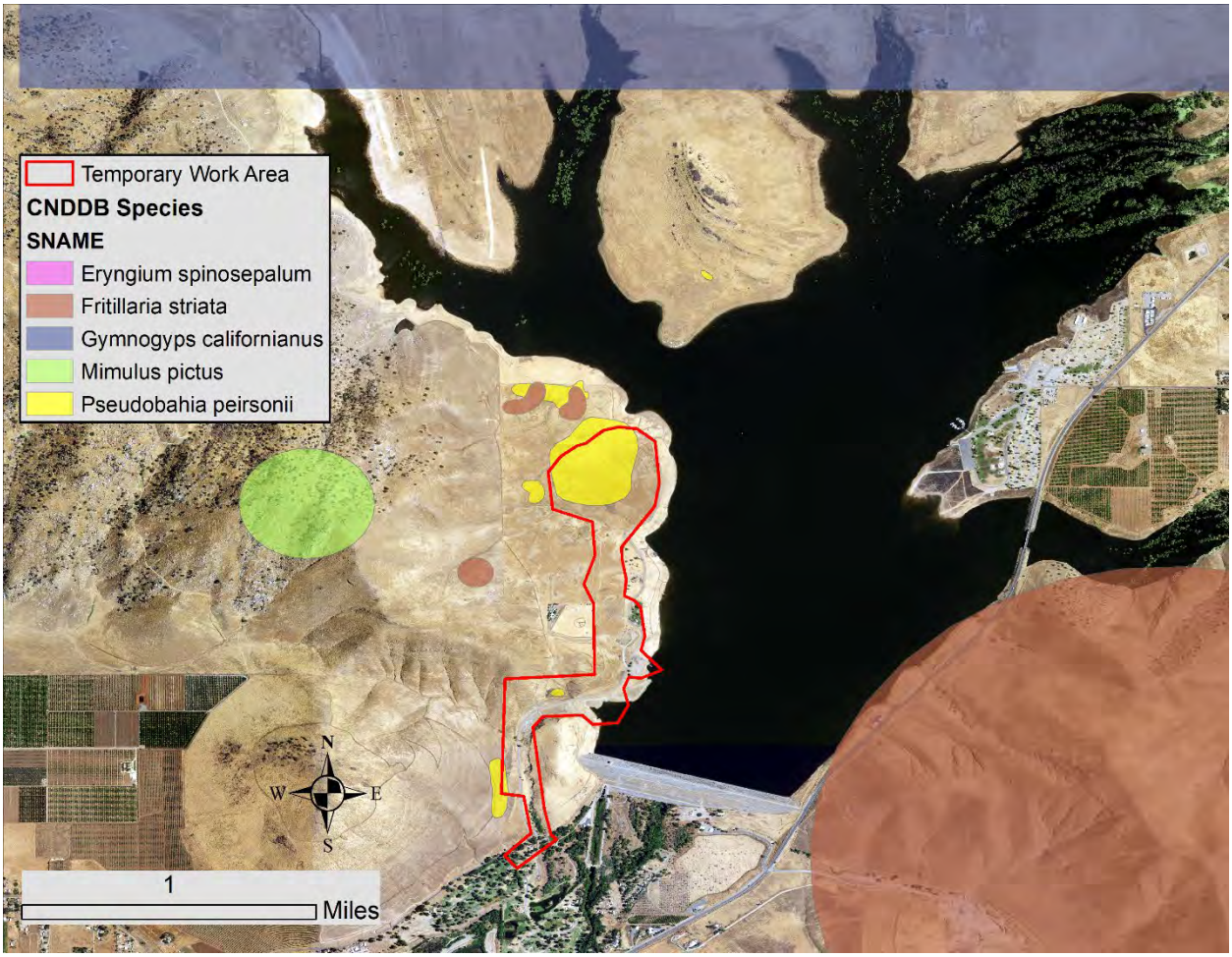

Figure 17. Occurrence of federally-protected species within and near the Phase 1 temporary work area (red outline) from CNDDB (CDFW 2019). The blue polygon for California condor (*Gymnogyps californianus*) represents critical habitat.

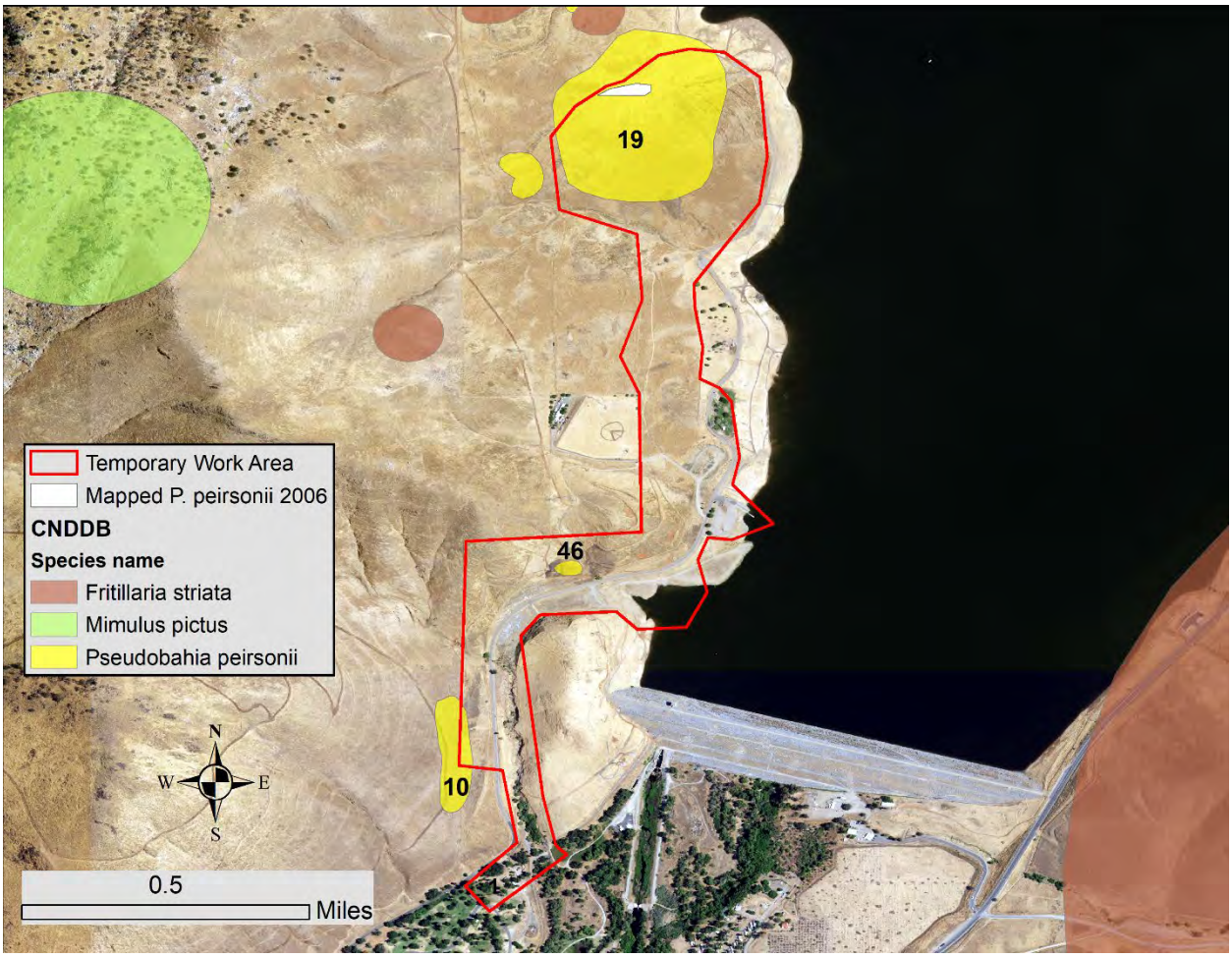

Figure 18. Occurrence numbers from CNDDB for San Joaquin adobe sunburst (*Pseudobahia peirsonii*) (yellow). Boat Island occurrence (#45) not shown since it is outside the Phase 1 temporary work area. This occurrence is visible in Figure 17 as a tiny yellow speck northeast of the project area on Boat Island. Occurrence 19 was more accurately mapped in 2006 with GPS (white polygon).

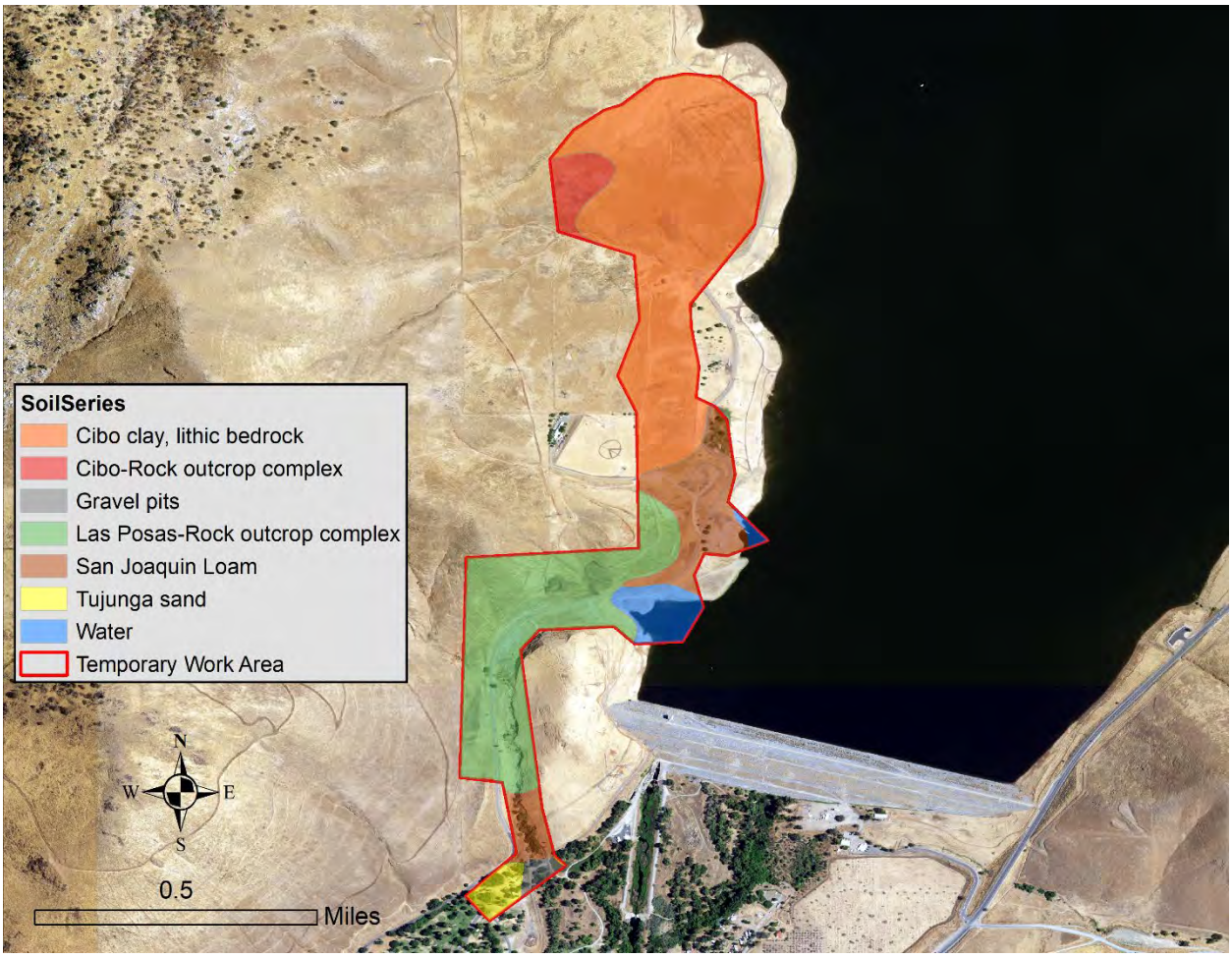

Figure 19. Mapped soil series within the project temporary work area. All soil series, except for Tujunga sand, are shallow to bedrock.

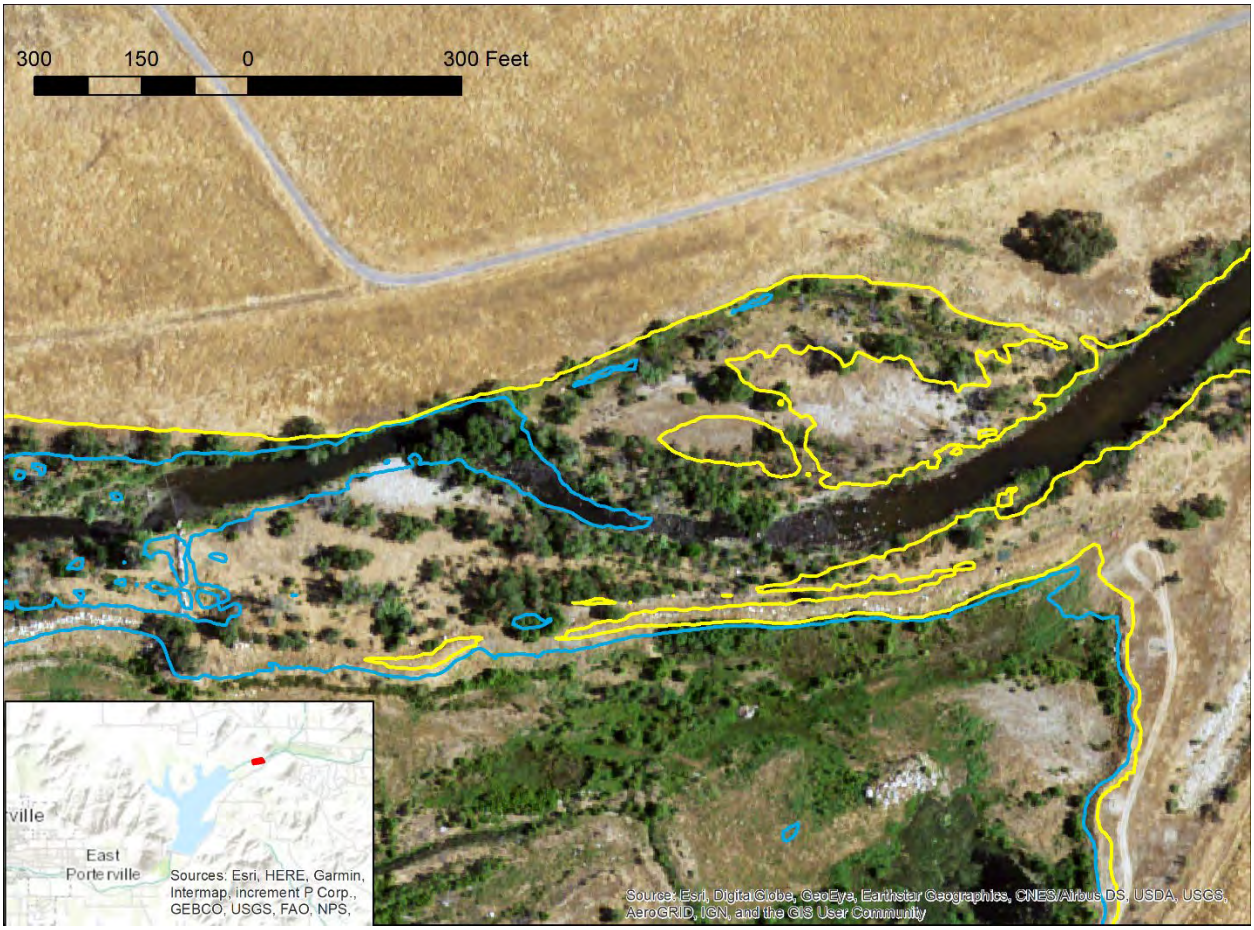

Figure 20. Proposed action would raise the existing potential maximum lake level, approximated by the blue contour line (652.5 ft), ten feet. The proposed potential maximum lake level, approximated by the yellow contour line (662.5 ft), has roughly a one percent chance each year of being flooded from the lake. The effect on existing vegetation is difficult to predict since this section of the Tule River is ungaged and current frequency and duration of flooding of the riparian area from the river is unknown.

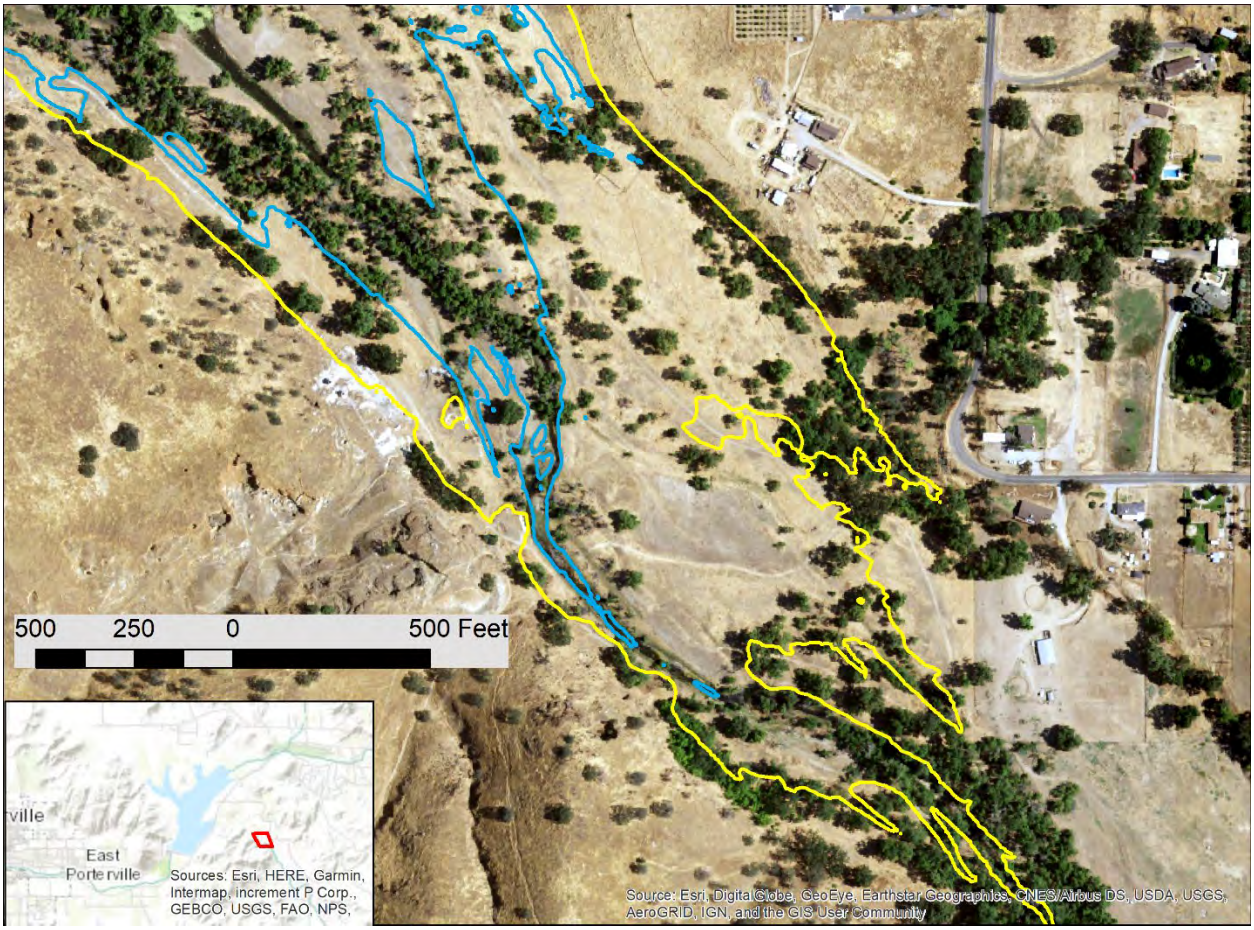

Figure 21. Proposed action would cause a section of the South Fork of the Tule River to periodically flood with lake water. This could increase the amount of riparian vegetation.

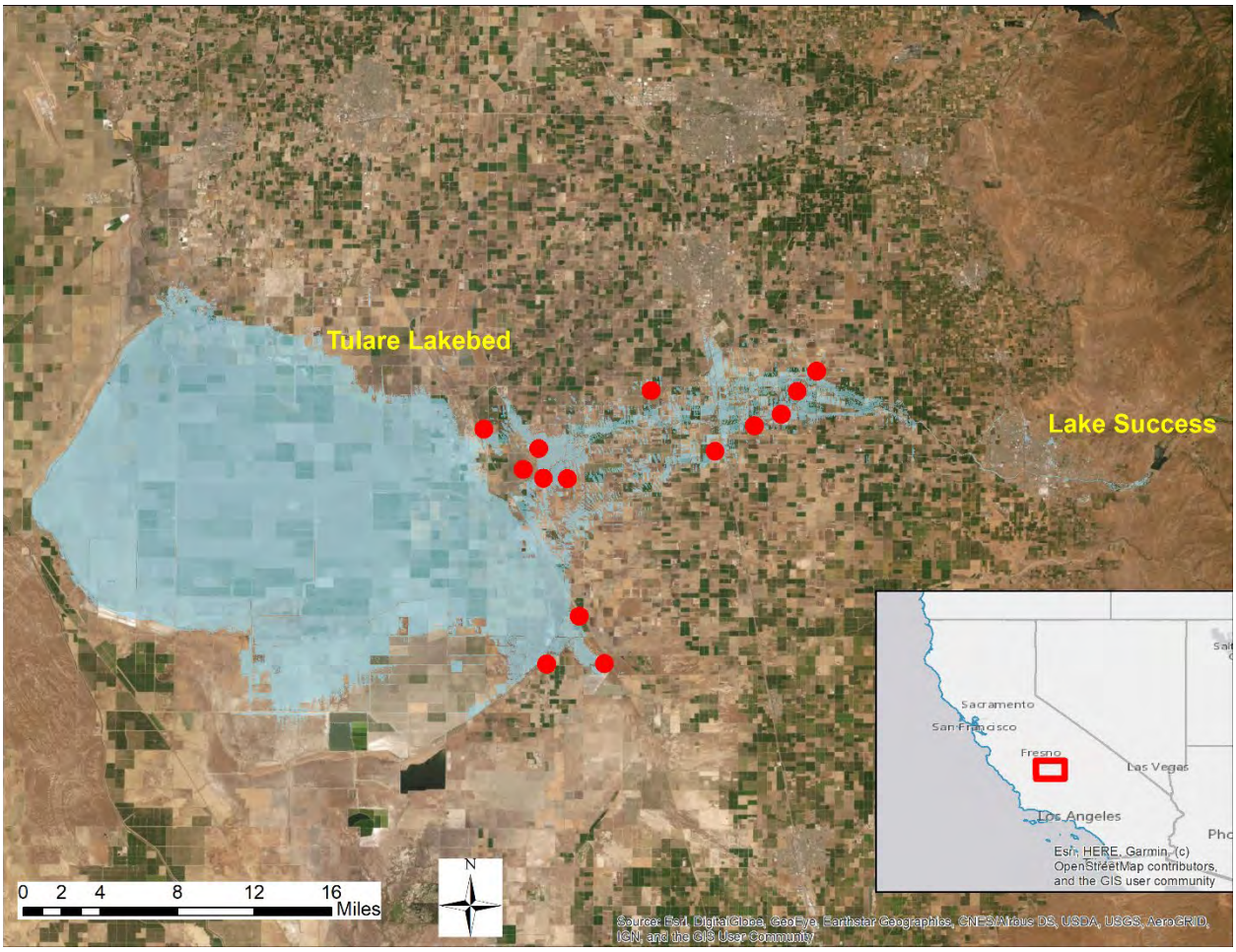

Figure 22. Occurrence of kit fox within and adjacent to the lower Tule River floodplain and Tulare Lakebed. All occurrences within the lower Tule River floodplain are from the early 1970s. One occurrence (third from the bottom of the map) is from 2002.

Table 1. Summary of effects from the proposed project (both Phase 1 and 2) to Federally endangered and threatened species.

Evolutionarily Significant Unit (ESU) / Distinct Population Segment (DPS) / Other	Listing Status	Resource Agency Jurisdiction	Critical Habitat Designation/ Action Area within Designated Critical Habitat (DHC)	Magnuson-Stevens Act Essential Fish Habitat / Effects Determination	Factors Affecting Determination	ESA Section 7 Effects Determination
Mammals						
San Joaquin Kit Fox (*Vulpes macrotis mutica*)	Endangered (March 11, 1967: 32 FR 4001)	USFWS	None Designated	N/A	The project actions may result in short term avoidance by foraging kit fox due to construction and blasting. However, the proposed action area is marginal habitat for kit fox and impacts are likely to be less than significant.	May affect, is likely to adversely affect
Birds						
California Condor (*Gymnogyps californianus*)	Endangered (March 11, 1967: 32 FR 4001)	USFWS	Outside DCH	N/A	Regional shrubland, coniferous forest, and oak savanna vegetation growth would remain consistent with baseline conditions. Therefore available habitat would not be diminished.	No Effect
Least Bell's Vireo (*Vireo bellii pusillus*)	Endangered (May 2, 1986: 51 FR 16474)	USFWS	Outside DCH	N/A	Local riparian vegetation growth would remain consistent with baseline conditions. Therefore available habitat would not be diminished.	May affect, but is not likely to adversely affect
Southwestern Willow Flycatcher (*Empidonax traillii extimus*)	Endangered (February 27, 1995: 60 FR 10694)	USFWS	Outside DCH	N/A	Local riparian vegetation growth would remain consistent with baseline conditions. Therefore available habitat would not be diminished.	May affect, but is not likely to adversely affect
Reptiles						
Blunt-nosed Leopard Lizard (*Gambelia silus*)	Endangered (March 11, 1967: 32 FR 4001)	USFWS	None Designated	N/A	Regional grassland and shrubland vegetation growth would remain consistent with baseline conditions. Therefore available habitat would not be diminished. Species is not known to currently occur east of Hwy 99 in Tulare County, which is more than 20 miles west of the proposed action.	No Effect
Giant Garter Snake (*Thamnophis gigas*)	Threatened (October 20, 1993: 58 FR 54053)	USFWS	Outside DCH	N/A	Based on the USFWS Final GGS Recovery Plan, the species is not currently found downstream from Lake Success along the Tule River, or anywhere else in Tulare County (USFWS 2017). Therefore, available habitat would not be diminished.	No Effect
Amphibians						

Evolutionarily Significant Unit (ESU) / Distinct Population Segment (DPS) / Other	Listing Status	Resource Agency Jurisdiction	Critical Habitat Designation/ Action Area within Designated Critical Habitat (DHC)	Magnuson-Stevens Act Essential Fish Habitat / Effects Determination	Factors Affecting Determination	ESA Section 7 Effects Determination
California Red-legged Frog (*Rana draytonii*)	Threatened (May 23, 1996: 61 FR 25813-25833)	USFWS	Outside DCH	N/A	Local riparian vegetation growth would remain consistent with baseline conditions. Therefore available habitat would not be diminished.	No Effect
Insects						
Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*)	Threatened (August 8, 1980: 45 FR 52803-52807)	USFWS	Outside DCH	N/A	Proposed action is >85 miles away from current species range (USFWS 2019). Regional riparian vegetation growth would not differ substantially from baseline conditions. Available habitat would not be significantly diminished.	No Effect
Fishes						
Delta Smelt (*Hypomesus transpacificus*)	Threatened (March 5, 1993: 58 FR 12854-12864)	USFWS	Outside DCH	N/A	Lake Success and the Tule River are outside the habitat range for this species.	No Effect
Flowering Plants						
Keck's Checker-mallow (*Sidalcea keckii*)	Endangered (February 16, 2000: 65 FR 7757-7764)	USFWS	Outside DCH	N/A	Local blue oak woodland growth would not differ substantially from baseline conditions. Available habitat would not be significantly diminished. Only known occurrence of this species within the "Success Dam" quad was extirpated in 2002 (CDFW 2019).	No Effect
San Joaquin Adobe Sunburst (*Pseudobahia peirsonii*)	Threatened (February 6, 1997: 62 FR 5542-5551)	USFWS	None Designated	N/A	Two occurrences of this species are within the project area footprint. Field surveys by a trained USACE botanist in 2019 determined that the species is not currently present. However, this action would directly, adversely affect known habitat.	May affect, is likely to adversely affect
Springville Clarkia (*Clarkia springvillensis*)	Threatened (September 14, 1998: 63 FR 49022-49035)	USFWS	None Designated	N/A	Both occurrences of this species at Success Lake listed on CNDDB are erroneous. These occurrences came from Corps surveys in 2006. Dr. Frank Vasek, the botanist who originally described the species, verified in 2008 that the collected specimens were actually an atypical outcrossing form of Kern River clarkia (*Clarkia exilis*) (Unger and Beyerl 2008)	No Effect

Table 2. San Joaquin adobe sunburst plant counts by CNDDB occurrence/location and survey year. See Figure 10 for general location of occurrences. 1991 = Stebbins, 2006 = Unger and Beyerl, 2010 = Vollmar Consulting (CDFW 2019), and 2014-2019 = Corps surveys (documented in written, internal reports).

CNDDB No.	Location	1991	2006	2010	2014	2016	2017	2019
10	Ave 146	45	N/S	40	0	10	0	0
19	Rocky Hill	200	30	0	0	0	0	0
45	Boat Isl.	N/S	45	0	0	N/S	N/S	0
46	Spillway	N/S	120	0	21	N/S	0	0

N/S = not surveyed that year

APPENDICES

APPENDIX A

IPaC Species List

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To:
Consultation Code: 08ESMF00-2019-SLI-0972
Event Code: 08ESMF00-2020-E-00730
Project Name: Tule River Road Relocation

October 31, 2019

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

Project Summary

Consultation Code: 08ESMF00-2019-SLI-0972

Event Code: 08ESMF00-2020-E-00730

Project Name: Tule River Road Relocation

Project Type: TRANSPORTATION

Project Description: Moving the Road that is next to the spillway so the spillway can be raised and widened. Directly related but separate from the Success Dam Spillway Raise. The Spillway Raise will be covered in another consultation.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/36.06779059421105N118.92357562891749W

Counties: Tulare, CA

Endangered Species Act Species

There is a total of 8 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
San Joaquin Kit Fox *Vulpes macrotis mutica* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2873	Endangered

Birds

NAME	STATUS
California Condor *Gymnogyps californianus* Population: U.S.A. only, except where listed as an experimental population There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8193	Endangered
Southwestern Willow Flycatcher *Empidonax traillii extimus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6749	Endangered

Reptiles

NAME	STATUS
Blunt-nosed Leopard Lizard *Gambelia silus*	Endangered

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/625

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii*	Threatened

There is **final** critical habitat for this species. Your location is outside the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/2891
Species survey guidelines:
https://ecos.fws.gov/ipac/guideline/survey/population/205/office/11420.pdf

Fishes

NAME	STATUS
Delta Smelt *Hypomesus transpacificus*	Threatened

There is **final** critical habitat for this species. Your location is outside the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/321

Flowering Plants

NAME	STATUS
Keck's Checker-mallow *Sidalcea keckii*	Endangered

There is **final** critical habitat for this species. Your location is outside the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/5704

San Joaquin Adobe Sunburst *Pseudobahia peirsonii*	Threatened

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/2931

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

APPENDIX B

Phase 1 design plans

US Army Corps of Engineers®
Sacramento District

Stantec TETRA TECH JOINT VENTURE

REGISTERED PROFESSIONAL ENGINEER — ANDY WAI — No. 59484 — EXP. 12-31-19 — CIVIL — STATE OF CALIFORNIA

SUCCESS DAM
TULARE COUNTY, CALIFORNIA
TULE RIVER SPILLWAY ENLARGEMENT PROJECT
PHASE 1

SOLICITATION NO.: WXXXXX-XX-X-XXXX
CONTRACT NO.: WXXXXXXXXXXX
ISSUE DATE: XX/XX/20XX
DRAWING FILE NUMBER: KT1-09-0372
SPEC NUMBER: 2287

USACE SACRAMENTO SIGNATURE BLOCK
PREPARED UNDER THE DIRECTION OF:

_____
Col. Corps of Engineers, Sacramento District

APPROVED BY:

_____
Chief, Engineering Division

APPROVED FUNCTIONAL ADEQUACY:

_____
Chief, Design Branch

This project was designed by the Sacramento District of the U. S. Army Corps of Engineers.The initials or signatures and registration designations of individuals appear on these project documents within the scope of their employment as required by ER 1110-1-8152

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY:	ISSUE DATE:
A.CHANG	SOLICITATION NO.
DRAWN BY:	XXXXXX-XX-X-XXXX
K.NGUYEN	CONTRACT NO.
CHECKED BY:	XXXXXXXXXXX
Y.H.CHEN	SPEC NO.
SUBMITTED BY:	2287
A.CHANG	DESIGN FILE NO.
SCALE:	KT1 - 09 - 0372
ANSI D	

U.S. ARMY CORPS OF ENGINEERS
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SACRAMENTO, CALIFORNIA 95814

Stantec TETRA TECH JV
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IRVINE, CA 92618
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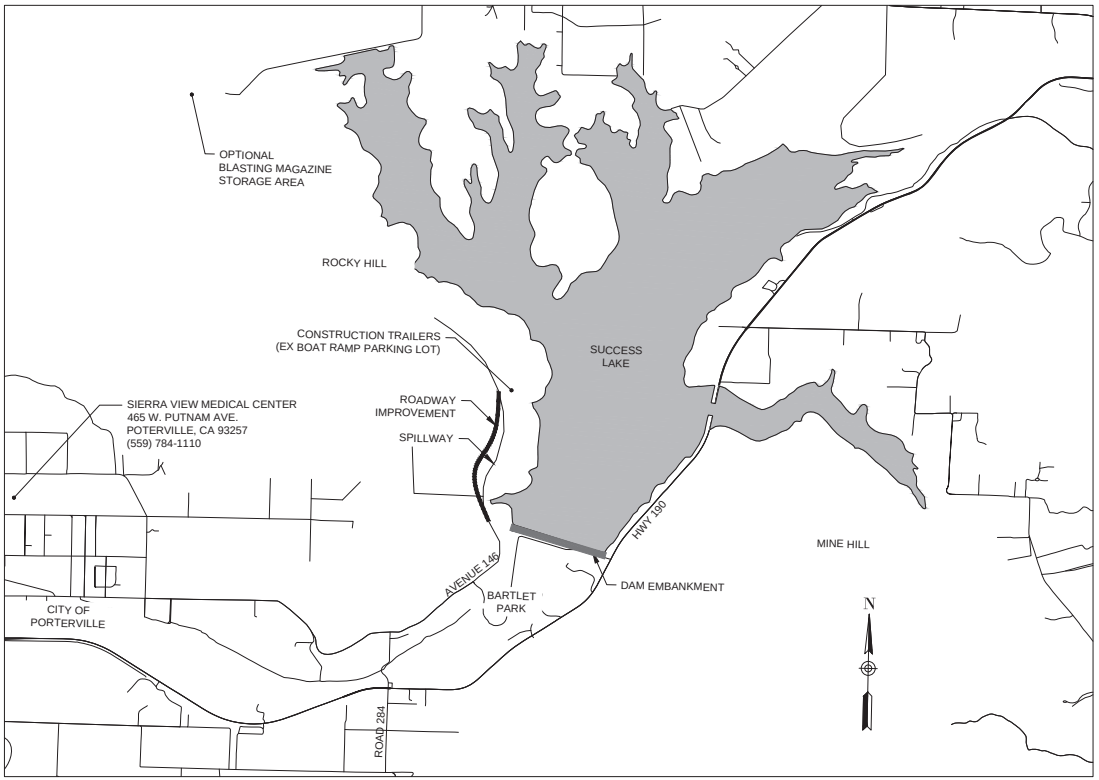
TULARE COUNTY, CALIFORNIA
TULE RIVER SPILLWAY ENLARGEMENT PROJECT
PHASE 1

TITLE SHEET

SHEET ID
G-001

TL-09-G001 TITLE SHEET.dwg

NOT FOR CONSTRUCTION - FINAL DRAFT SUBMITTAL



LOCATION MAP

SCALE: 1" = 2000'

VICINITY MAP

SCALE: N.T.S.

0 2,000 4,000 Feet

SCALE: 1" = 2,000'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY:	ISSUE DATE:
A.GONG	SOLICITATION NO.
DRAWN BY:	
K. NGUYEN	
CHECKED BY:	CONTRACT NO.
Y-H CHEN	
SUBMITTED BY:	SPEC. NO.
A. GONG	2287
APPD.	FILE NAME
ANSI D	KTT_09_0372

U.S. ARMY CORPS OF ENGINEERS
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TULARE COUNTY, CALIFORNIA
TULE RIVER SPILLWAY ENLARGEMENT PROJECT
PHASE 1

LOCATION AND VICINITY MAP

REGISTERED PROFESSIONAL ENGINEER
ANDY WAI GONG
No. 56484
EXP. 12-31-19
CIVIL
STATE OF CALIFORNIA

SHEET ID

G-002

TL-09-G002 SITE AND VICINITY MAP.dwg

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SHEET INDEX TO CONTRACT DRAWINGS

ABBREVIATIONS

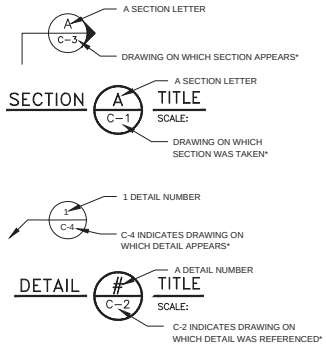
AC	ASPHALT CONCRETE
AB	AGGREGATE BASE
Adj.	ADJUST
APPROX.	APPROXIMATE
Alt.	ALTERNATE
B.C.	BEGIN HORIZONTAL CURVE
Bk.	BACK
BM	BENCHMARK
C	CURVE
CHAN.	CHANNEL
C.L	CONTROL LINE
C.J.	CONSTRUCTION JOINT
CLR.	CLEARANCE
C.L.F.	CHAIN LINK FENCE
CMP	CORRUGATED METAL PIPE
CONT.	CONTINUOUS
CY	CUBIC YARDS
Dbl.	DOUBLE
DIA.	DIAMETER
DIAG.	DIAGONAL
DG.	DECOMPOSED GRANITE
D/S	DOWNSTREAM
Ea.	EACH
E.C.	END HORIZONTAL CURVE
EG.	EXISTING GRADE
EL/ELV.	Elevation
EX.	EXISTING
EXP. JT.	EXPANSION JOINT
F.G./FG	FINISHED GRADE
F.L./FL.	FLOW LINE
FWY	FREEWAY
FS	FINISH SURFACE
G.L.	GRADE LINE
GTD	GRADE TO DRAIN
HP	HIGH POINT
HT.	HEIGHT
Horiz.	HORIZONTAL
ID.	INSIDE DIAMETER
IF	INSIDE FACE
Int.	INTERSECTION
INV.	INVERT
Jt.	JOINT
KO	CONTRACTING OFFICER
L	LENGTH
LVC	LENGTH OF VERTICAL CURVE
L.O.L.	LAYOUT LINE
Lt.	LEFT
MAX.	MAXIMUM
MFR	MANUFACTURER
M.H.	MANHOLE
MIN.	MINIMUM
Misc.	MISCELLANEOUS
No.	NUMBER
O.C.	ON CENTER
OD.	OUTSIDE DIAMETER
OF	OUTSIDE FACE
OH	OVERHEAD LINE
P.C.	POINT OF CURVATURE
P.C.C.	PORTLAND CEMENT CONCRETE
PERM	PERMANENT
PI	POINT OF INTERSECTION
PIP	PROTECT IN PLACE
PL.	PLATE
POB	POINT OF BEGINNING
POE	POINT OF ENDING
PMF	PROBABLE MAXIMUM FLOOD
P.T.	POINT OF TANGENCY
PVI	POINT OF VERTICAL INTERSECTION
R	RADIUS
R.C.B.	REINFORCED CONCRETE BOX
R.C.P.	REINFORCED CONCRETE PIPE
RD.	ROAD
REINF.	REINFORCING
Ret.	RETAINING
Rt.	RIGHT
R/W	RIGHT-OF-WAY
S.F.	SQUARE FOOT
Symm.	SYMMETRICAL
SD	SIDE DRAIN
STD	STANDARD
T	TANGENT
T&B	TOP AND BOTTOM
TEMP.	TEMPORARY
TF	TOP OF FOOTING
TOB	TOP OF BANK
TW	TOP OF WALL
TWA	TEMPORARY WORK AREA
TYP.	TYPICAL
U/S	UPSTREAM
USACE	UNITED STATES ARMY CORPS OF ENGINEERS
Vert.	VERTICAL
V.P.I.	VERTICAL POINT OF INTERSECTION
WWM	WELDED WIRE MESH

GENERAL LEGEND

- CENTERLINE
- POWER POLE
- MANHOLE
- CONTROL LINE
- RIGHT-OF-WAY
- TWA LIMIT
- PROPOSED ROADWAY
- GRAZING LEASE DRIVEWAY
- HAUL ROAD
- EXISTING ROAD
- ORIGINAL STOCKPILE AREA
- APPROXIMATE DAYLIGHT
- EXCAVATED SURFACE
- EXISTING SEWER LINE
- EXISTING WATER LINE
- EXISTING ELECTRICAL LINE
- EXISTING GAS LINE
- FENCE
- TRAFFIC DIRECTION
- EXISTING SURVEY MONUMENT
- PROPOSED SURVEY MONUMENT
- HAUL ROUTE

DETAIL AND SECTION DESIGNATION

* IF SECTION OR DETAIL APPEARS ON THE SAME DRAWING AS THE CALLOUT, THE DRAWING REFERENCE IS REPLACED WITH A DASH (-)



US Army Corps of Engineers

MARK	DESCRIPTION	DATE

DESIGNED BY: A.GONG
DRAWN BY: K. NGUYEN
CHECKED BY: YH CHEN
SUBMITTED BY: A. GONG
SCALE: AS NOTED
ISSUE DATE:
SOLICITATION NO.
CONTRACT NO.
SPEC. NO.: 2287
FILE NAME: K11_09_0372

U.S. ARMY CORPS OF ENGINEERS
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TULARE COUNTY, CALIFORNIA
TULE RIVER SPILLWAY ENLARGEMENT PROJECT
PHASE 1

SHEET INDEX, ABBREVIATIONS, AND LEGEND

SHEET ID
G-003

REGISTERED PROFESSIONAL ENGINEER
ANDY WAI GONG
No. 56484
EXP. 12-31-19
CIVIL
STATE OF CALIFORNIA

TL-09-G003 SHEET INDEX, ABBREVIATIONS, AND LEGENDS.dwg

NOT FOR CONSTRUCTION - FINAL DRAFT SUBMITTAL

GENERAL NOTES

1. THE LOCATION AND ELEVATIONS OF EXISTING UTILITIES SHOWN OF THE PLANS ARE BASED ON ABOVE GROUND SURVEYS AND THE BEST AVAILABLE RECORD INFORMATION. UTILITY INFORMATION IS NOT INTENDED TO BE EXACT OR COMPLETE. NEITHER THE USACE, TULARE COUNTY, ENGINEER NOR THE CONTRACTING OFFICER CAN GUARANTEE THE ACCURACY OR COMPLETENESS OF UTILITIES SHOWN. THE CONTRACTOR SHALL CONTACT USA NORTH BY DIALING 811 AT LEAST 48 HOURS IN ADVANCE OF ANY CONSTRUCTION WORK TO ALLOW UTILITY OPERATORS TO CHECK AND MARK LOCATIONS OF EXISTING FACILITIES. THE CONTRACTOR SHALL PROTECT UTILITIES NEAR CONSTRUCTION ACTIVITIES AND COORDINATE WITH UTILITY COMPANIES FOR REMOVAL OR RELOCATION OF INTERFERING FACILITIES. THE CONTRACTOR IS RESPONSIBLE FOR COMPARING THE PLANS TO EXISTING CONDITIONS AND FOR VERIFYING ACTUAL FIELD CONDITIONS. IT SHALL BE THE CONTRACTOR'S SOLE RESPONSIBILITY TO PROTECT ALL EXISTING UTILITIES IN PLACE, UNLESS OTHERWISE NOTED OR SPECIFIED.
2. CONTRACTOR SHALL VERIFY SITE CONDITIONS AND LOCATION AND SIZE OF UNDERGROUND UTILITIES AS SHOWN ON THE DRAWINGS AND REPORT ANY DISCREPANCIES TO THE CONTRACTING OFFICER PRIOR TO COMMENCING WORK.
3. THE CONTRACTOR SHALL NOTIFY, IN WRITING, AND COORDINATE WITH ALL UTILITY COMPANIES AND GOVERNMENT AGENCIES PRIOR TO EXCAVATION WORK AND CALL USA NORTH PRIOR TO COMMENCING WORK.
4. FOR BORING LOGS AND OTHER GEOTECHNICAL INFORMATION, SEE GEOTECHNICAL DATA REPORT, TULE RIVER SPILLWAY ENLARGEMENT PROJECT, LAKE SUCCESS CALIFORNIA, DECEMBER 2019. CONTRACTOR IS RESPONSIBLE TO OBTAIN ALL GEOTECHNICAL REPORT UPDATES.
5. SITE SECURITY DURING CONSTRUCTION SHOULD CONSIST OF TEMPORARY FENCING TO BE INSTALLED AND MAINTAINED BY THE CONTRACTOR DURING THE ENTIRE CONSTRUCTION OF THE PROJECT
6. THE CONTRACTOR SHALL COMPLY WITH THE USACE SAFETY MANUAL EM385-1-1 IN ADDITION TO ALL LOCAL, STATE AND FEDERAL REGULATIONS RELATED TO THE SAFETY OF PERSONNEL AND THE PUBLIC ON THE JOB SITE, INCLUDING APPLICABLE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) REGULATIONS.
7. DURING THE COURSE OF ALL WORK ON THE PROJECT, THE CONTRACTOR SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR ALL JOB SITE CONDITIONS INCLUDING SAFETY OF ALL PERSONS AND SECURITY OF ALL PROPERTY. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK USING THE SKILLS AND ATTENTION UTILIZED WITHIN THE INDUSTRY. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THIS CONTRACT. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE USACE, TULARE COUNTY AND THE ENGINEER HARMLESS FROM ANY AND ALL LIABILITY REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF THE WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE USACE, TULARE COUNTY OR ENGINEER.
8. DETAILS ON THE PLANS ARE INTENDED TO SHOW THE FINAL RESULT OF DESIGN. MINOR MODIFICATIONS MAY BE REQUIRED TO SUIT JOB SITE DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.
9. ALL BID ITEMS ARE COMPLETE IN PLACE, INCLUDING FURNISHING ALL MATERIALS, EQUIPMENT, TOOLS, INCIDENTALS, PERSONNEL AND SUPERINTENDENCE REQUIRED.
10. IF UNANTICIPATED CONDITIONS ARE ENCOUNTERED DURING THE COURSE OF CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY BRING THE CONDITION TO THE ATTENTION OF THE CONTRACTING OFFICER.
11. ALL REVISIONS TO THE CONTRACT DOCUMENTS SHALL BE APPROVED BY THE CONTRACTING OFFICER, IN WRITING, BEFORE ANY WORK ASSOCIATED WITH THE REVISION IS COMMENCED.
12. ALL FEES AND PERMITS REQUIRED FOR THE WORK SHALL BE OBTAINED AND PAID FOR BY THE CONTRACTOR.
13. THE CONTRACTOR SHALL LIMIT ALL CONSTRUCTION ACTIVITIES TO AREAS THAT ARE WITHIN THE TEMPORARY WORK AREA (TWA) SHOWN ON THE PLANS.
14. ALL TRASH, RUBBLE AND DEBRIS, INCLUDING BURIED TRASH, RUBBLE AND DEBRIS ENCOUNTERED FROM BEGINNING, DURING, AND THROUGH THE CONTRACT PERFORMANCE PERIOD WITHIN THE PROJECT LIMITS SHALL BE REMOVED AND PROPERLY DISPOSED BY THE CONTRACTOR AT AN APPROVED, OFFSITE LOCATION. THE CONTRACTOR SHALL PAY ALL ASSOCIATED DUMPING OR DISPOSAL FEES.
15. THE SIZE, LOCATION AND TYPE OF ANY UNDERGROUND UTILITIES OR IMPROVEMENTS ENCOUNTERED DURING THE WORK SHALL BE ACCURATELY NOTED AND PLACED ON AS-BUILT DRAWINGS, KEPT BY THE CONTRACTOR, AND SUBMITTED TO THE CONTRACTING OFFICER UPON COMPLETION OF THE PROJECT.
16. LOCATIONS OF EXISTING STORM DRAINS ARE BASED ON ABOVE GROUND SURVEYS OF VISIBLE FEATURES. THE CONTRACTOR SHALL VERIFY ALL STORM DRAIN CONNECTIONS IN THE FIELD.
17. THE CONTRACTOR SHALL PERFORM EXCAVATION IN A SAFE CONDITION. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR SHORING, SHEETING, OR OTHER PROTECTIVE MEASURES TO PREVENT DAMAGE TO ADJACENT PROPERTIES, STRUCTURES OR UTILITY FACILITIES.
18. TRAFFIC CONTROL SHALL BE PROVIDED AND MAINTAINED IN ACCORDANCE WITH PART VI OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (2009 EDITION) AS WELL AS ANY CALTRANS AND LOCAL JURISDICTION MODIFICATIONS THERETO.

ENVIRONMENTAL CONTROL AND MAINTENANCE OF SITE CONDITIONS

1. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DEVELOP A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE CONSTRUCTION AREA. SWPPP ELEMENTS AND WORK SHALL BE CONFINED WITHIN THE TEMPORARY WORK AREA LIMITS, WITH A MINIMUM INTERIOR BUFFER OF ONE FOOT. THE SWPPP SHALL BE SUBMITTED AND APPROVED BY THE GOVERNING AGENCY PRIOR TO COMMENCEMENT OF ANY WORK ON THE PROJECT.
2. THE CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL AS REQUIRED THROUGHOUT CONSTRUCTION AND INSPECT EROSION CONTROLS ON A MINIMUM WEEKLY BASIS.
3. PRIOR TO THE BEGINNING OF ANY CONSTRUCTION PHASE THE CONTRACTOR SHALL INSTALL ALL EROSION CONTROL REQUIRED AND ADD ADDITIONAL EROSION CONTROL AS NECESSARY IN SUBSEQUENT CONSTRUCTION PHASES. THE CONTRACTOR SHALL INSPECT ALL EROSION CONTROL AND MAKE ANY REPAIRS REQUIRED AS WELL AS CONFIRM THE INSTALLATION OF ANY ADDITIONAL EROSION CONTROL WHICH IS SPECIFIC TO ANY CONSTRUCTION PHASE.
4. THE CONTRACTOR'S STAGING AND STORAGE AREA SHALL CONFORM TO ALL EROSION CONTROL DETAILS AND SPECIFICATIONS. IF TEMPORARY DRAINAGE IS REQUIRED WITHIN THE STAGING AND STORAGE AREA IT SHALL CONFORM TO ALL EROSION CONTROL SPECIFICATIONS AND DETAILS AND APPROVED BY THE GOVERNING AGENCY PRIOR TO INSTALLATION.
5. ALL SOILS STORED WITHIN THE CONTRACTOR STAGING AND STORAGE AREA SHALL BE SURROUNDED BY SILT FENCE AND COVERED TO PREVENT WIND EROSION.
6. ALL TREE PROTECTION SHALL BE MAINTAINED AND INSPECTED THROUGHOUT CONSTRUCTION.
7. ALL DISTURBED AREAS SHALL BE LOAMED AND SEEDED AS SOON AS POSSIBLE. CONTRACTOR SHALL WATER AS REQUIRED BY CONTRACT DOCUMENTS TO ASSURE PROPER GROWTH.
8. PRECAUTIONS SHALL BE TAKEN TO PREVENT DUST FROM CONSTRUCTION OPERATIONS BECOMING A NUISANCE TO ADJACENT AREAS. SURROUNDING STREETS AND WALKWAYS SHALL BE SWEPT AND WASHED CLEAN ON A DAILY BASIS OR AS DIRECTED BY GOVERNING AGENCY. STOCKPILES AND UNSTABILIZED SURFACES SHALL BE KEPT MOIST.
9. CONTRACTOR SHALL MAINTAIN VEHICULAR AND PEDESTRIAN TRAFFIC IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
10. UPON COMPLETION OF TRENCH BACKFILLING OR OTHER INDIVIDUAL ITEMS OF CONSTRUCTION, ALL SURPLUS MATERIALS AND EQUIPMENT SHALL BE MOVED TO THE DESIGNATED STAGING AND STOCKPILE LOCATIONS , LEAVING THE CONSTRUCTION SITE AND SURROUNDINGS FREE AND CLEAN.
11. AFTER WORK IS COMPLETE, SEWERS, DRAINS, MANHOLES, CATCH BASINS AND OTHER STRUCTURES SHALL BE CAREFULLY CLEANED OF DIRT, ROCKS, BROKEN MASONARY, MORTAR AND OTHER DEBRIS AND LEFT READY FOR USE.
12. THE CONTRACTOR SHALL PROTECT ALL ADJACENT PROPERTY AND EXISTING AND NEW IMPROVEMENTS, AND SHALL PROVIDE POSITIVE CONTROL OF EARTH SPILLAGE, CONSTRUCTION WATER AND RUNOFF WATER FROM THE SITE.
13. MIGRATORY BIRD SURVEY WILL BE CONDUCTED BY USACE PRIOR TO CONSTRUCTION. MONITORING (E.G., IN THE EVENT THAT A PROTECTED SPECIES IS NESTING AND MONITORING IS NEED), THE CONTRACTOR IS RESPONSIBLE FOR THIS DURING CONSTRUCTION OR UNTIL BIRDS ARE MIGRATED AWAY.
14. IF ACTIVE NESTS ARE IDENTIFIED, A 50FT BUFFER ZONE (300FT FOR RAPTORS) AROUND THE NEST WILL BE IMPLEMENTED AND NO CONSTRUCTION ACTIVITIES SHALL TAKE PLACE IN THE BUFFER ZONE WHILE THE NEST IS ACTIVE.

SITE PREPARATION AND DEMOLITION

1. CONTRACTOR SHALL DISPOSE OF ALL DEMOLISHED MATERIAL AND DEBRIS IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REQUIREMENTS HAVING JURISDICTION.
2. CONTRACTOR SHALL RESTORE TO THEIR ORIGINAL CONDITION ANY AREAS ADJACENT TO AND OUTSIDE THE LIMIT OF WORK WHICH ARE DISTURBED DURING CONSTRUCTION, AT THE CONTRACTOR'S OWN EXPENSE.
3. CONTRACTOR MAY USE THE TEMPORARY STAGING AREAS AS SHOWN ON SHEETS GC-100 TO GC-103 FOR STOCKPILING. THIS EXCLUDES STAGING AREA LOCATION 1.
4. CONTRACTOR SHALL STOCKPILE ALL STRIPPED SOIL ONSITE AND ADHERE TO SWPPP REQUIREMENTS.
5. CONTRACTOR SHALL ADHERE TO COMPLIANCE TO SWPPP REQUIREMENTS AND PROVIDE ADEQUATE DRAINAGE AT ALL TIMES WITHIN THE LIMIT OF WORK. THERE SHALL BE NO PONDING OF WATER OR EROSION OF LANDSCAPED AREAS AT ANY TIME.
6. EXISTING UTILITIES, INDICATED TO REMAIN, SHALL BE PROTECTED IN PLACE, AND MAINTAINED IN GOOD WORKING CONDITION. CONTRACTOR TO BE HELD LIABLE FOR ANY DAMAGES THAT MAY INCUR FOR EXISTING UTILITIES AND WILL BE HELD RESPONSIBLE FOR ANY REPAIR.
7. CONTRACTOR TO HAVE AN EVACUATION PLAN FROM THE SPILLWAY FOR STAFF AND EQUIPMENT FOR POTENTIAL FLOODING DURING THE WET SEASON.

LAYOUT

1. THE CONTRACTOR SHALL MAINTAIN ALL HORIZONTAL AND VERTICAL CONTROL THROUGHOUT CONSTRUCTION. ALL INITIAL CONTROL, AS WELL AS ANY ADDITIONAL CONTROL OR RE-ESTABLISHING OF DISTURBED CONTROL, SHALL BE PROVIDED TO THE GOVERNING AGENCY IN ELECTRONIC AUTOCAD FORMAT WITHIN 24 HOURS OF THE ACCEPTANCE OF THE WORK AS ACCEPTED BY THE GOVERNING AGENCY. SEE SPECIFICATIONS FOR DETAILED REQUIREMENTS RELATED TO ESTABLISHING AND MAINTAINING SURVEY AND LAYOUT CONTROL ON THE SITE.
2. LABELED DIMENSIONS SUPERSEDE SCALED DIMENSIONS FOR ALL LAYOUT WORK.
3. ALL HORIZONTAL DRAWING DIMENSIONS SHALL BE MEASURED IN A TRUE HORIZONTAL PLANE, EXCEPT AS OTHERWISE NOTED.

GRADING

1. THE CONTRACTOR SHALL PROVIDE UNIFORM SLOPE BETWEEN SPOT GRADES AND CONTOURS.
2. THE CONTRACTOR SHALL ADJUST ALL EXISTING UTILITY CASTINGS TO LINE AND GRADE, UNLESS OTHERWISED NOTED AT NO ADDITIONAL COST TO THE GOVERNMENT.

GEOTECHNICAL NOTES

1. NEITHER THE USACE NOR THE ENGINEER WARRANT OR GUARANTEE THE RESULTS OF ANY GEOTECHNICAL OR SUBSURFACE INVESTIGATION(S) PERFORMED FOR THIS PROJECT AS BEING REPRESENTATIVE OF THE SITE BEYOND THE ACTUAL LOCATION OF THE TEST SPECIMEN(S) OR BOREHOLE AND ASSUME NO RESPONSIBILITY FOR THE MANNER IN WHICH THIS INFORMATION MAY BE USED OR THE CONCLUSIONS REACHED IN UTILIZING THE INFORMATION AS CONTAINED OR REFERENCED IN THE CONTRACT DOCUMENTS.
2. FURTHER THE USACE AND THE ENGINEER NEITHER WARRANT NOR GUARANTEE THE CONCLUSIONS REACHED, RECOMMENDATIONS MADE OR TEST RESULTS PRESENTED AS PART OF THE GEOTECHNICAL OR SUBSURFACE INVESTIGATION(S) AS BEING REPRESENTATIVE OF THE ENTIRE SITE.
3. THE CONTRACTOR IS ADVISED THAT IT SHALL BE THEIR SOLE RESPONSIBILITY TO SUPPLEMENT ANY INFORMATION SO PROVIDED WITH ADDITIONAL SUBSURFACE INVESTIGATION(S) AND/OR TESTING, AT THE SOLE EXPENSE OF THE CONTRACTOR, IN ORDER TO ASSURE THEMSELVES THAT THE INFORMATION PROVIDED IN THE CONSTRUCTION DOCUMENTS IS REPRESENTATIVE OF THE CONDITIONS TO BE ENCOUNTERED WITHIN THE LIMITS OF THE PROJECT AT THE TIME OF CONSTRUCTION.
4. SUCH INVESTIGATION(S) SHALL BE UNDERTAKEN AND COMMENCE ONLY UPON OBTAINING APPROVAL, IN WRITING, FROM THE USACE KO.

REGISTERED PROFESSIONAL ENGINEER
ANDY WAI GONG
No. 96484
EXP. 12-31-19
CIVIL
STATE OF CALIFORNIA

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: A.GONG
DRAWN BY: K. NGUYEN
CHECKED BY: YH CHEN
SUBMITTED BY: A.GONG
APPD BY: ANDY

ISSUE DATE:
SOLICITATION NO.
CONTRACT NO.
SPEC. NO.: 2287
FILE NAME: K11 - 09 - 0372

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT
1325 J STREET
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Stantec / TETRA TECH
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PHONE: (949) 6950300 FAX: (949) 8964010

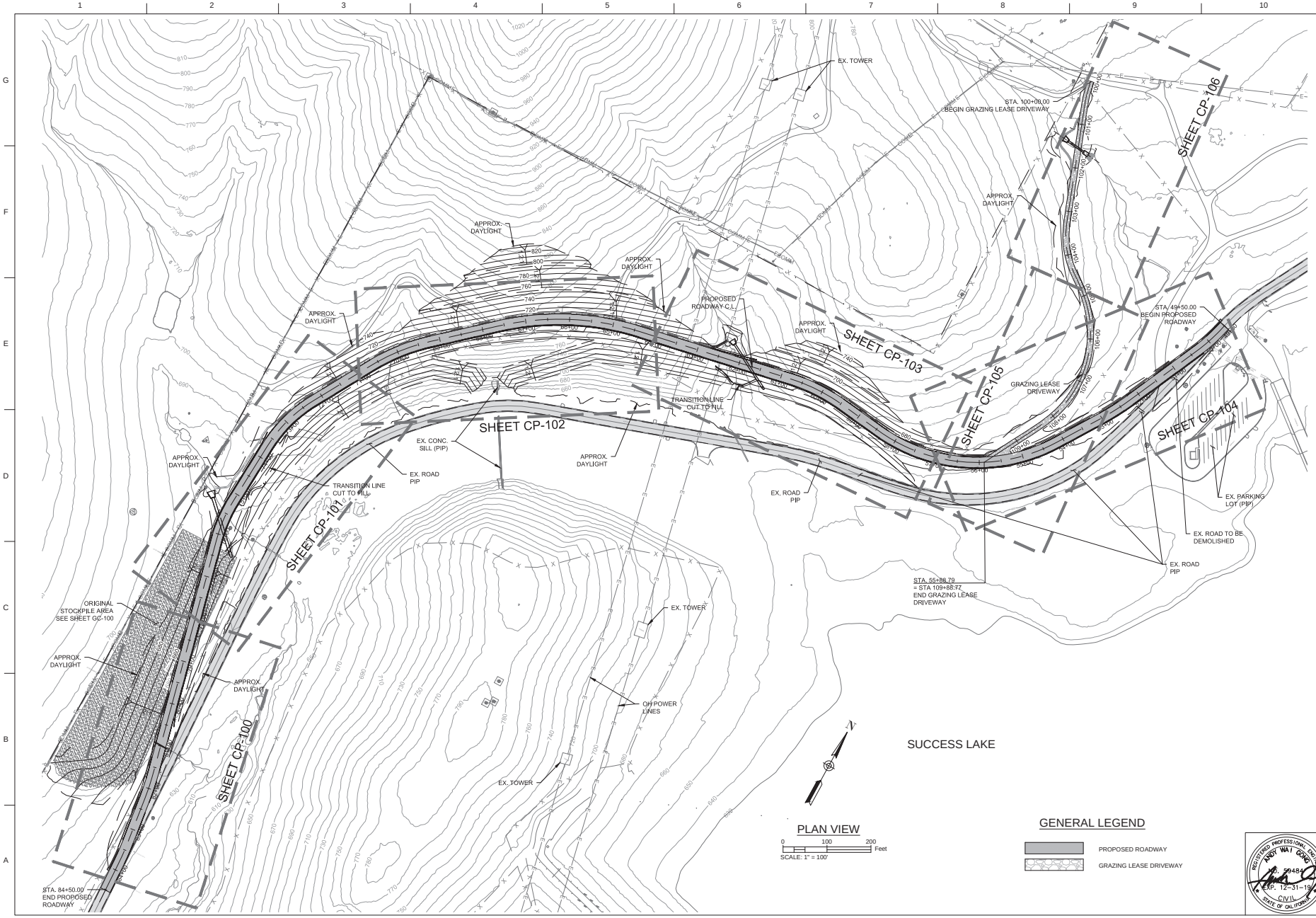
TULARE COUNTY, CALIFORNIA
TULE RIVER SPILLWAY ENLARGEMENT PROJECT
PHASE 1

GENERAL NOTES

SHEET ID
G-004

TL-09-G004 GENERAL NOTES.dwg

NOT FOR CONSTRUCTION - FINAL DRAFT SUBMITTAL



US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: A. GONG
DRAWN BY: K. NGUYEN
CHECKED BY: Y-H CHEN
SUBMITTED BY: A. GONG
DATE: ANSI D
ISSUE DATE:
SOLICITATION NO.
CONTRACT NO.
SPEC. NO.: 2287
FILE NAME: K11 - 09 - 0372

U.S. ARMY CORPS OF ENGINEERS
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TULARE COUNTY, CALIFORNIA
TULE RIVER SPILLWAY ENLARGEMENT PROJECT
PHASE 1

SHEET LAYOUT

SHEET ID
G-005

REGISTERED PROFESSIONAL ENGINEER
ANDY WAI GONG
No. 56484
EXP. 12-31-19
CIVIL
STATE OF CALIFORNIA

TL-09-G005 SHEET LAYOUT.dwg

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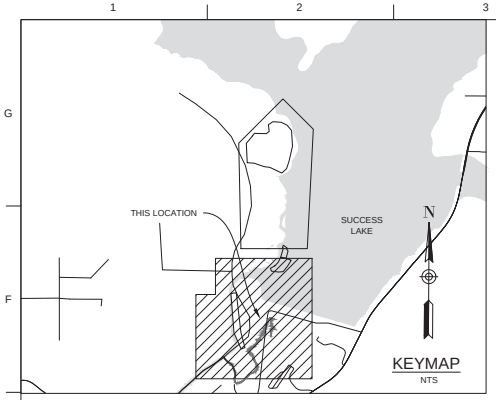
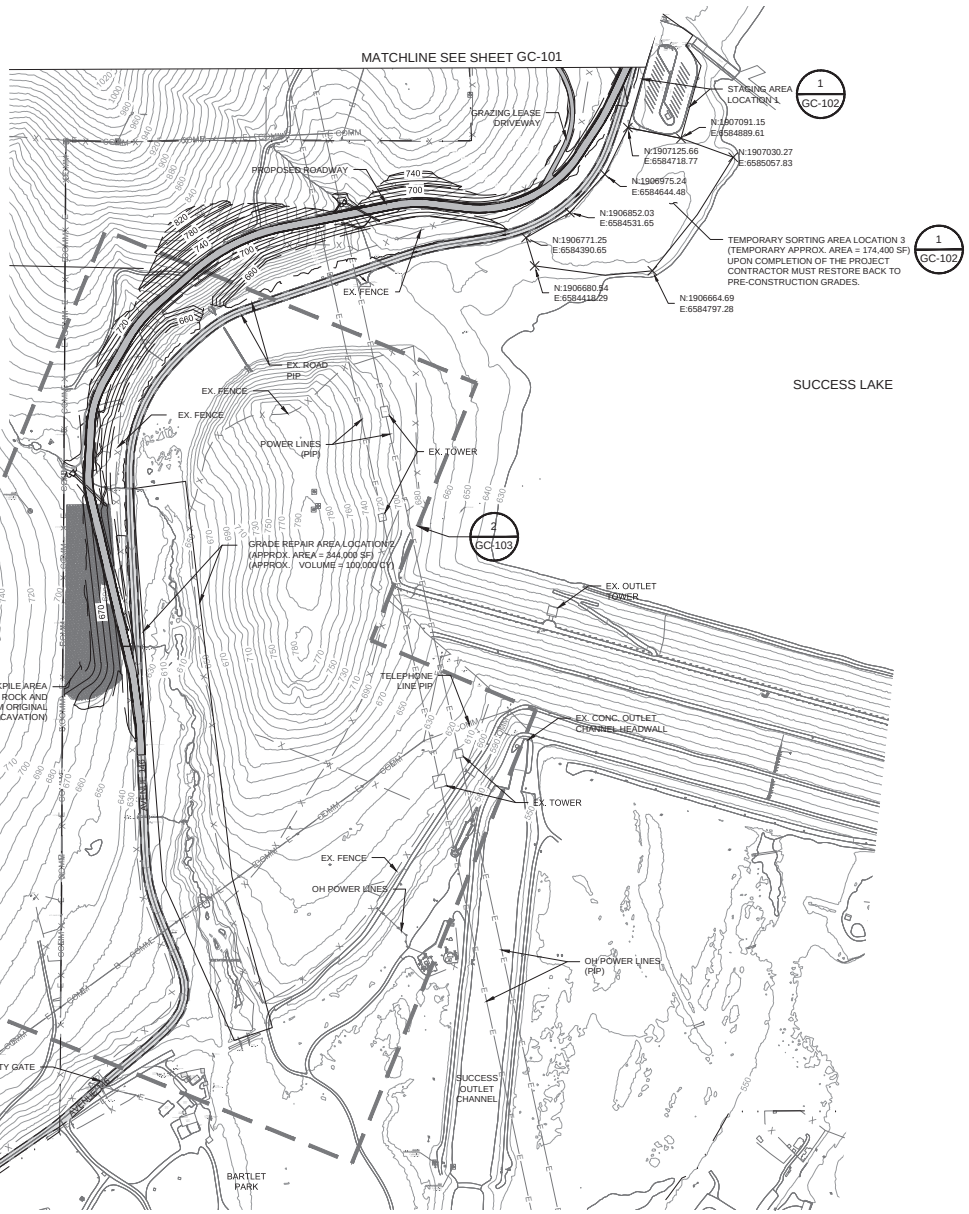


MATCHLINE SEE SHEET GC-101



ORIGINAL STOCKPILE AREA

NOTES:

1. CONTRACTOR TO USE EXTREME CAUTION WHILE OPERATING NEAR OR UNDER ALL UTILITY LINES.
2. CONTRACTOR TO PRACTICE GOOD HOUSE KEEPING BMP MEASURES FOR STOCKPILE AREA.
3. CONTRACTOR TO SATISFY LOCAL AND STATE REQUIREMENTS FOR STOCKPILING PROCEDURES.
4. CONTRACTOR TO REMOVE ALL EXISTING INTERFERING FENCE. GRAZING LEASE TO BE SUSPENDED DURING CONSTRUCTION. LIVESTOCK TO BE REMOVED BY OWNER PRIOR TO START OF CONSTRUCTION.
5. CONTRACTOR TO RESTORE EXISTING PAVEMENT ON AVENUE 146 FROM THE BARTLETT PARK ENTRANCE TO THE PROPOSED ROADWAY OR AS DIRECTED BY THE KO, TO PRE-CONSTRUCTION CONDITIONS.
6. CONTRACTOR TO PROVIDE SECURITY FENCING AROUND STOCKPILE AND STAGING AREAS FOR SAFETY AND SECURITY. CONTRACTOR TO PROVIDE CLEARING, GRADING, AND BENCHING THAT MAY BE REQUIRED FOR STOCKPILE CONSTRUCTION.
7. ORIGINAL STOCKPILE AREA EXPECT TO REMOVE LARGE MATERIALS SUCH AS BOULDERS.

LEGEND:

PROPOSED ROADWAY

N

PLAN VIEW

0 200 400 Feet

SCALE: 1" =200'

US Army Corps of Engineers

MARK	DESCRIPTION	DATE

DESIGNED BY: A.GONG
DRAWN BY: K. NGUYEN
CHECKED BY: YH CHEN
SUBMITTED BY: A.GONG
DATE: ANSI D
ISSUE DATE:
SOLICITATION NO.
CONTRACT NO.
SPEC. NO.: 2287
FILE NAME: KTT - 09 - 0372

U.S. ARMY CORPS OF ENGINEERS
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TULARE COUNTY, CALIFORNIA
TULE RIVER SPILLWAY ENLARGEMENT PROJECT
PHASE 1

STAGING AREA LOCATION 1, GRADING REPAIR AREA LOCATION 2, AND TEMPORARY SORTING AREA LOCATION 3

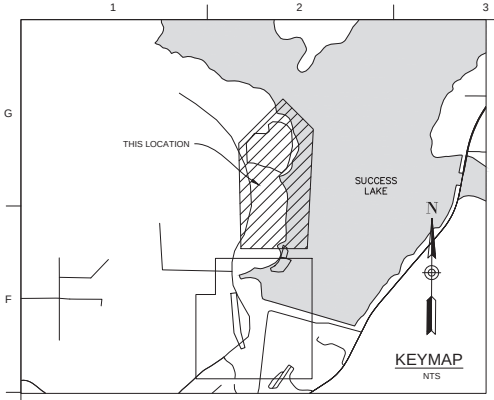
SHEET ID

GC-100

REGISTERED PROFESSIONAL ENGINEER
ANDY WAI GONG
No. 56484
EXP. 12-31-19
CIVIL
STATE OF CALIFORNIA

NOT FOR CONSTRUCTION - FINAL DRAFT SUBMITTAL

TL-09-GC-100 STOCKPILE LOCATION 1.dwg

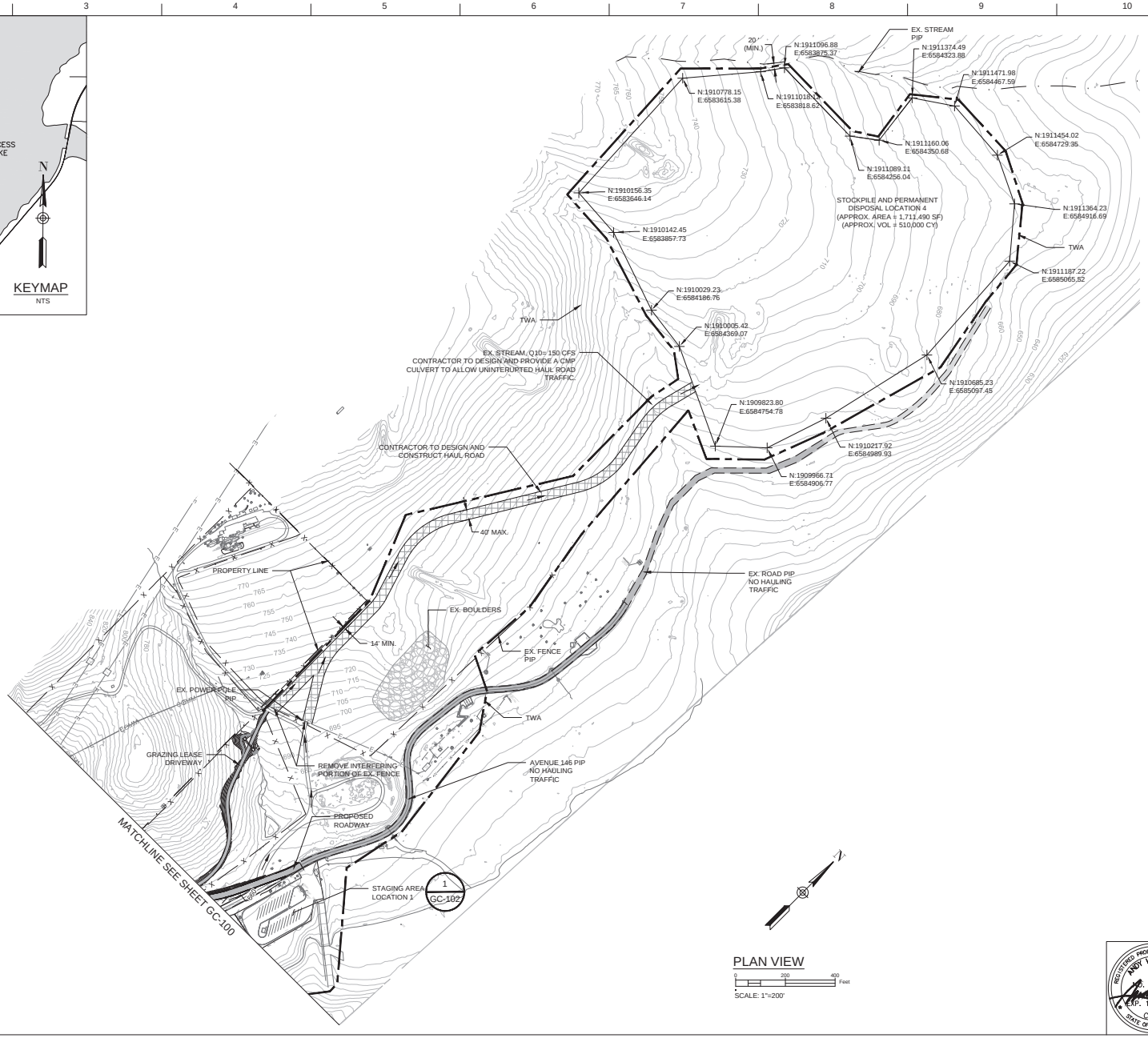


NOTES:

1. CONTRACTOR TO USE EXTREME CAUTION WHILE OPERATING NEAR OR UNDER ALL UTILITY LINES.
2. CONTRACTOR TO PRACTICE GOOD HOUSE KEEPING BMP MEASURES FOR STOCKPILE AREA.
3. CONTRACTOR TO REMOVE INTERFERING PORTION OF THE FENCING. GRAZING LEASE TO BE SUSPENDED DURING CONSTRUCTION. LIVESTOCK TO BE REMOVED BY OWNER PRIOR TO START OF CONSTRUCTION.
4. CONTRACTOR TO SATISFY LOCAL AND STATE REQUIREMENTS FOR FOR STOCKPILING PROCEDURES. CONTRACTOR TO PROVIDE CLEARING, GRADING, BENCHING THAT MAY BE REQUIRED FOR STOCKPILE CONSTRUCTION.
5. CONTRACTOR TO RESTORE EXISTING AVENUE 146 PAVEMENT TO PRE-CONSTRUCTION CONDITIONS IF USED FOR CONSTRUCTION ACTIVITY.
6. CONTRACTOR TO PROVIDE SECURITY FENCING AROUND STOCKPILE AND STAGING AREAS FOR SAFETY AND SECURITY.
7. STOCKPILE VOLUME ASSUMES 25' HIGH W/ 2H:1V SLOPES.
8. THE HAUL ROAD AS SHOWN PROVIDES A GENERAL LOCATION AND IS CONSIDERED AS REFERENCE.
9. HAUL ROAD TO BE CONSTRUCTED WITH COURSE AGGREGATE FROM BLAST ROCK EXCAVATION.
10. HAUL ROAD TO BE CONSTRUCTED TO A MIN. ELEVATION OF 670'

LEGEND:

- HAUL ROAD
- EX. ROAD
- PROPOSED ROADWAY
- GRAZING LEASE DRIVEWAY
- HAUL ROUTE



PLAN VIEW

SCALE: 1"=200'

US Army Corps of Engineers

MARK	DESCRIPTION	DATE

DESIGNED BY:	ISSUE DATE:
A.GONG	SOLICITATION NO.
DRAWN BY: K. NGUYEN	
CHECKED BY: Y-H CHEN	CONTRACT NO.
SUBMITTED BY: A. GONG	SPEC. NO.: 2189'
APPD BY: ANSI D	FILE NAME: K:\T1 - 09 - 0372

U.S. ARMY CORPS OF ENGINEERS
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TULARE COUNTY, CALIFORNIA
TULE RIVER SPILLWAY ENLARGEMENT PROJECT
PHASE 1

STOCKPILE AND PERMANENT DISPOSAL LOCATION 4

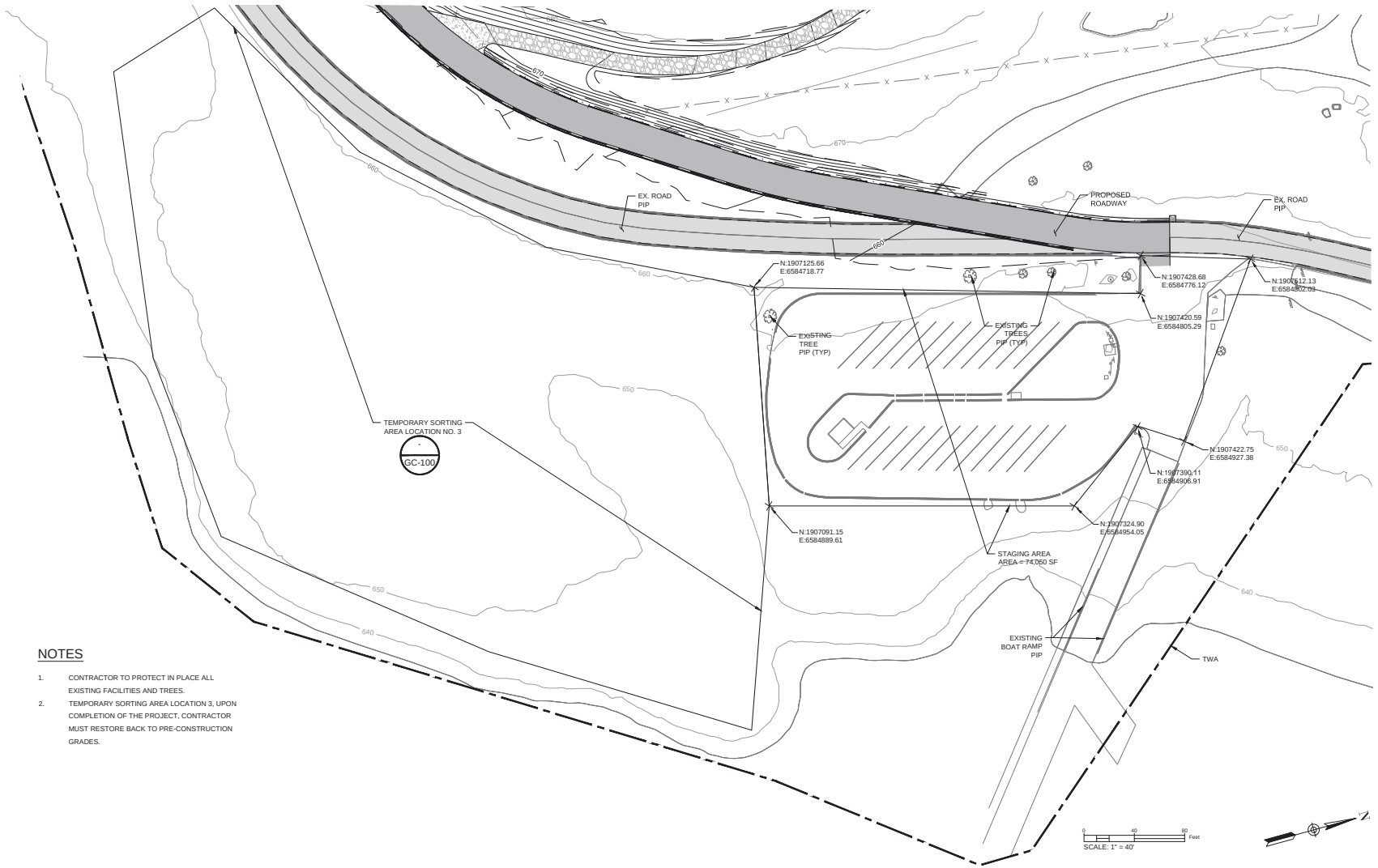
REGISTERED PROFESSIONAL ENGINEER
ANDY WAI GONG
No. 56484
EXP. 12-31-19
CIVIL
STATE OF CALIFORNIA

SHEET ID

GC-101

TL-09-GC-101 STOCKPILE LOCATION 5.dwg

NOT FOR CONSTRUCTION - FINAL DRAFT SUBMITTAL



NOTES

1. CONTRACTOR TO PROTECT IN PLACE ALL EXISTING FACILITIES AND TREES.
2. TEMPORARY SORTING AREA LOCATION 3, UPON COMPLETION OF THE PROJECT, CONTRACTOR MUST RESTORE BACK TO PRE-CONSTRUCTION GRADES.

DETAIL 1 / GC-100 STAGING AREA LOCATION 1 AND TEMPORARY SORTING AREA LOCATION 3

SCALE: 1" = 40'

US Army Corps of Engineers

MARK	DESCRIPTION	DATE

DESIGNED BY: A.GONG
DRAWN BY: K. NGUYEN
CHECKED BY: Y-H CHEN
SUBMITTED BY: A. GONG
DATE:
ANSI D

ISSUE DATE:
SOLICITATION NO.
CONTRACT NO.
SPEC. NO.: 2287
FILE NAME: K:T1_09_ 0372

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT
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TULARE COUNTY, CALIFORNIA
TULE RIVER SPILLWAY ENLARGEMENT PROJECT
PHASE 1

STAGING AREA LOCATION 1 AND TEMPORARY SORTING AREA LOCATION 3

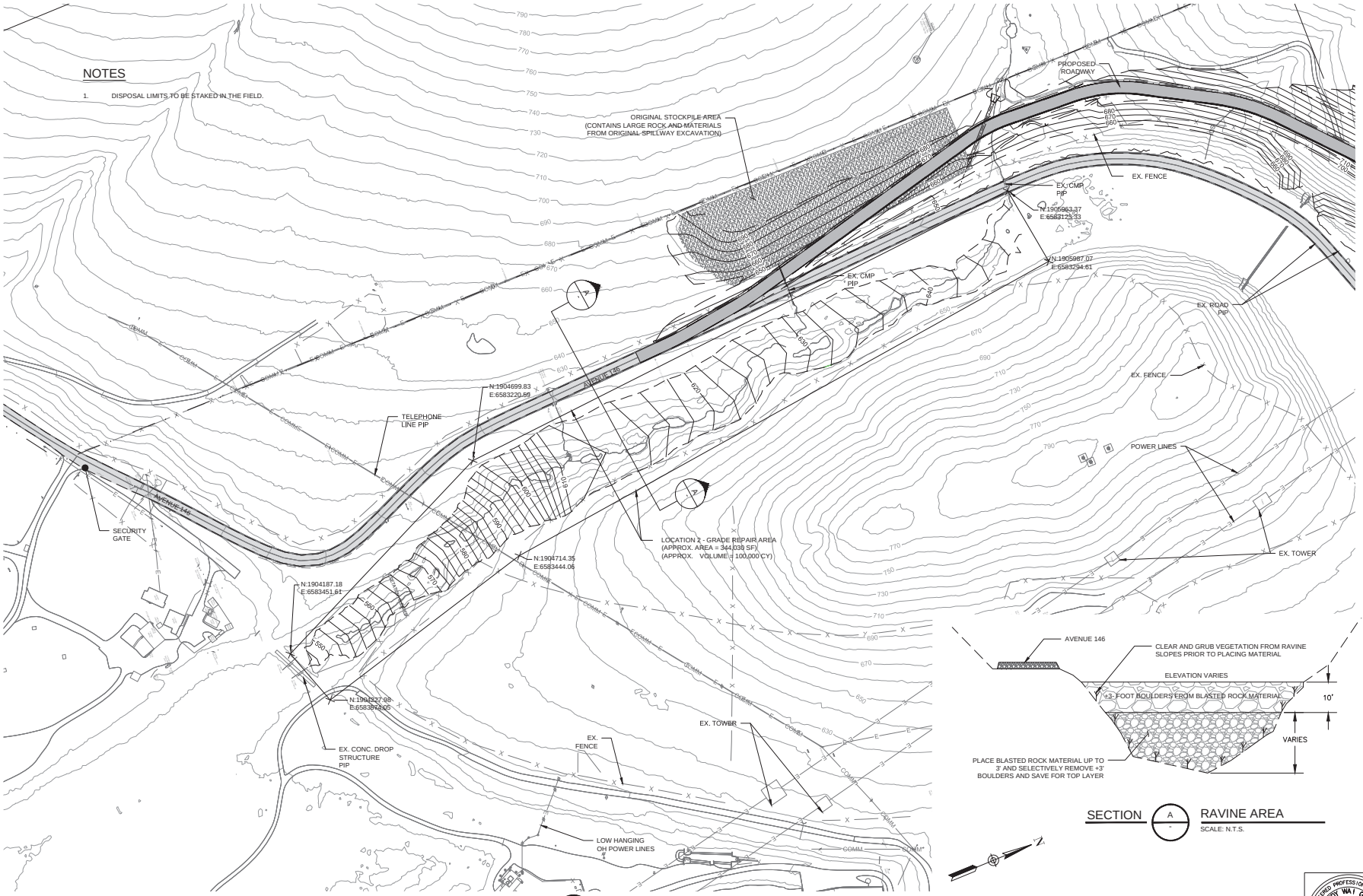
SHEET ID

GC-102

REGISTERED PROFESSIONAL ENGINEER
ANDY WAI GONG
No. 56484
EXP. 12-31-19
CIVIL
STATE OF CALIFORNIA

TL-09-GC-102 STOCKPILE LOCATION 1.dwg

NOT FOR CONSTRUCTION - FINAL DRAFT SUBMITTAL



US Army Corps of Engineers

MARK	DESCRIPTION	DATE

DESIGNED BY:	ISSUE DATE:
ANDY WAI GONG	SOLICITATION NO.
DRAWN BY: K. NGUYEN	
CHECKED BY: YI CHEN	CONTRACT NO.
SUBMITTED BY: A. GONG	SPEC. NO.: 2287
APPD. BY: ANSI D	FILE NAME: K:\TL-09\...\03\72

U.S. ARMY CORPS OF ENGINEERS
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Stantec / TETRA TECH
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TULARE COUNTY, CALIFORNIA
TULE RIVER SPILLWAY ENLARGEMENT PROJECT
PHASE 1

GRADE REPAIR AREA LOCATION 2

REGISTERED PROFESSIONAL ENGINEER
ANDY WAI GONG
No. 56484
EXP. 12-31-19
CIVIL
STATE OF CALIFORNIA

SHEET ID
GC-103

TL-09-GC-103 STOCKPILE LOCATION 1.dwg

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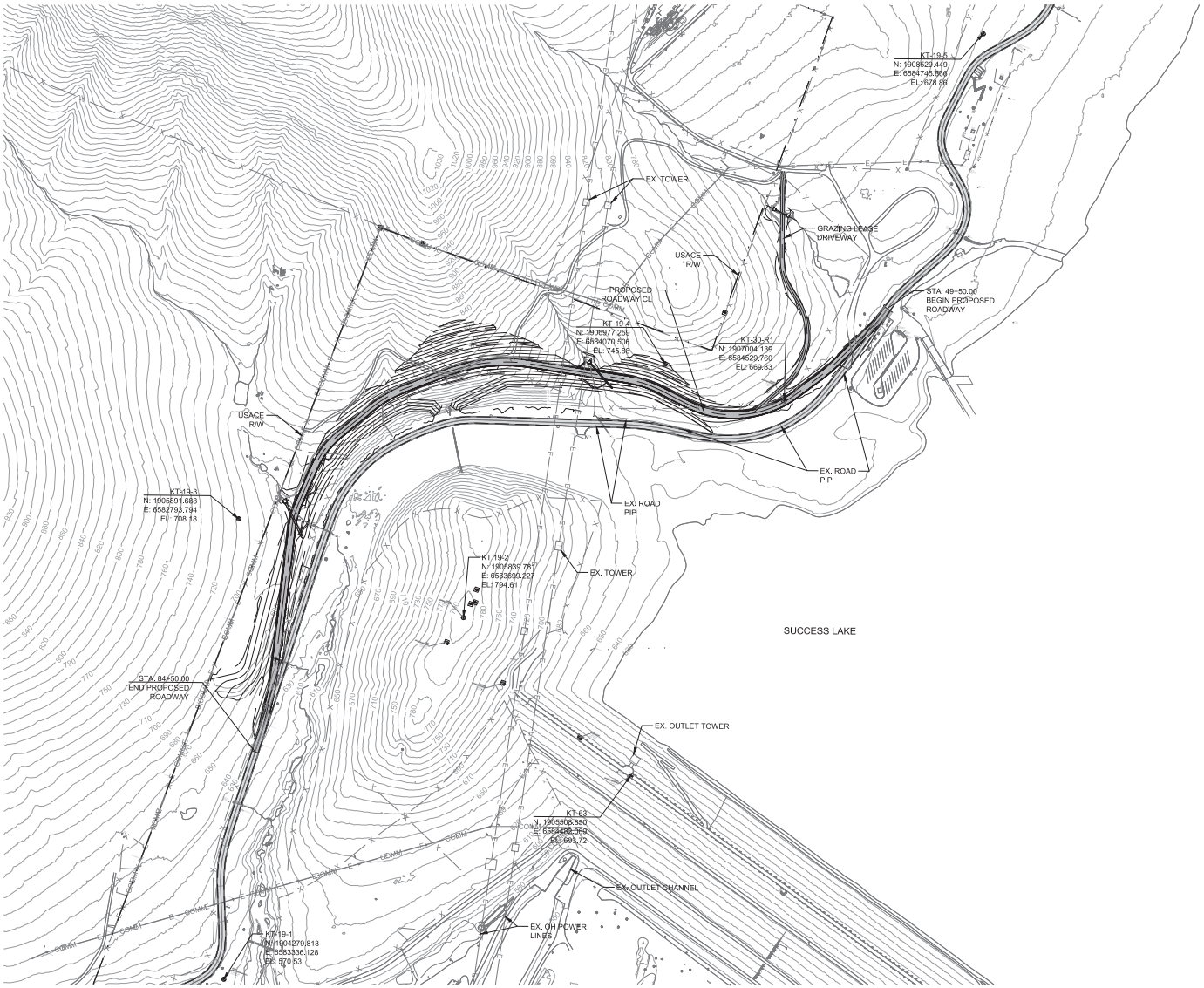

SURVEY NOTES

1. ZONE SPCS: NAVD83 CA ZONE4 SPCS (2011)
2. VERTICAL DATUM: NAVD88 (GEIOD 12B)
3. UNIT OF MEASURE: US. SURVEY FEET
4. TOPOGRAPHY USED FOR DESIGN WAS PREPARED ON MARCH 2019, BY TERRADON INC.
5. THE FOLLOWING TABLE PRESNTS THE EXISTING SURVEY MONUMENTS TO BE USED:

Monument	Northing	Easting	Elevation	Description
KT 19-1	1904279.813	6583336.128	570.526	Type B Monument
KT 19-2	1905839.782	6583699.235	794.609	Type G Monument
KT 19-3	1905891.687	6582793.800	708.186	Type G Monument
KT 19-4	1906977.258	6584070.511	745.876	Type G Monument
KT 19-5	1908529.450	6584745.872	678.863	Type G Monument
KT 30-R1	1907004.137	6584529.724	670.483	Type G Monument
KT 200	1904693.72	6587247.33	699.60	Existing Monument
KT 63	1905509.649	6584481.286	693.793	Existing Monument

LEGEND

- NEW SURVEY CONTROL MONUMENT
- EXISTING SURVEY CONTROL MONUMENT

N

PLAN VIEW

0 200 400 Feet

SCALE: 1" = 200'

REGISTERED PROFESSIONAL ENGINEER
ANDY WAI GONG
No. 56484
EXP. 12-31-19
CIVIL
STATE OF CALIFORNIA

US Army Corps of Engineers

MARK	DESCRIPTION	DATE

DESIGNED BY: A.GONG
DRAWN BY: K. NGUYEN
CHECKED BY: Y-H CHEN
SUBMITTED BY: A.GONG
APPD: ANSI D
ISSUE DATE:
SOLICITATION NO.
CONTRACT NO.
SPEC. NO.: 2287
FILE NAME: KT_09_0372

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT
1325 J STREET
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TULARE COUNTY, CALIFORNIA
TULE RIVER SPILLWAY ENLARGEMENT PROJECT
PHASE 1

SURVEY CONTROL PLAN

SHEET ID
V-100

TL-09-V100 HORIZONTAL CONTROL.dwg

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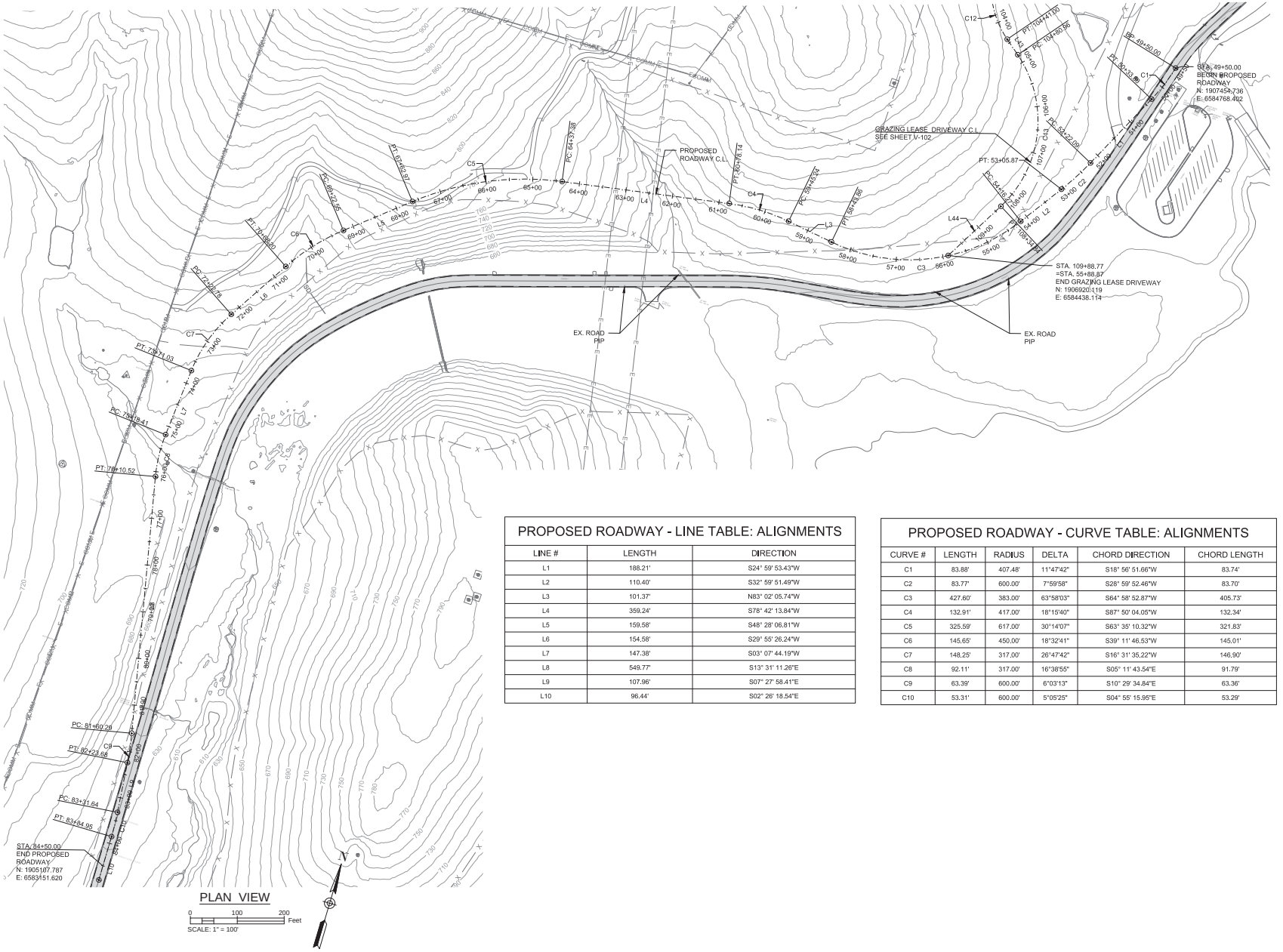

PROPOSED ROADWAY - LINE TABLE: ALIGNMENTS

LINE #	LENGTH	DIRECTION
L1	188.21'	S24° 59' 53.43"W
L2	110.40'	S32° 59' 51.49"W
L3	101.37'	N83° 02' 05.74"W
L4	359.24'	S78° 42' 13.84"W
L5	159.58'	S48° 28' 06.81"W
L6	154.58'	S29° 55' 26.24"W
L7	147.38'	S03° 07' 44.19"W
L8	549.77'	S13° 31' 11.26"E
L9	107.96'	S07° 27' 58.41"E
L10	96.44'	S02° 26' 18.54"E

PROPOSED ROADWAY - CURVE TABLE: ALIGNMENTS

CURVE #	LENGTH	RADIUS	DELTA	CHORD DIRECTION	CHORD LENGTH
C1	83.88'	407.48'	11°47'42"	S18° 56' 51.66"W	83.74'
C2	83.77'	600.00'	7°59'58"	S28° 59' 52.46"W	83.70'
C3	427.60'	383.00'	63°58'03"	S64° 58' 52.87"W	405.73'
C4	132.91'	417.00'	18°15'40"	S87° 50' 04.05"W	132.34'
C5	325.59'	617.00'	30°14'07"	S63° 35' 10.32"W	321.83'
C6	145.65'	450.00'	18°32'41"	S39° 11' 46.53"W	145.01'
C7	148.25'	317.00'	26°47'42"	S16° 31' 35.22"W	146.90'
C8	92.11'	317.00'	16°38'55"	S05° 11' 43.54"E	91.79'
C9	63.39'	600.00'	6°03'13"	S10° 29' 34.84"E	63.36'
C10	53.31'	600.00'	5°05'25"	S04° 55' 15.95"E	53.29'

US Army Corps of Engineers

MARK	DESCRIPTION	DATE

DESIGNED BY: A.GONG
DRAWN BY: K. NGUYEN
CHECKED BY: Y-H CHEN
SUBMITTED BY: A.GONG
DATE:
ANSI D

ISSUE DATE:
SOLICITATION NO.
CONTRACT NO.
SPEC. NO.: 2287
FILE NAME: K:TL_09_0372

U.S. ARMY CORPS OF ENGINEERS
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TULARE COUNTY, CALIFORNIA
TULE RIVER SPILLWAY ENLARGEMENT PROJECT
PHASE 1

PROPOSED ROADWAY HORIZONTAL CONTROL

SHEET ID
V-101

REGISTERED PROFESSIONAL ENGINEER
ANDY WAI GONG
No. 56484
EXP. 12-31-19
CIVIL
STATE OF CALIFORNIA

TL-09-V101 SURVEY CONTROL PLAN.dwg

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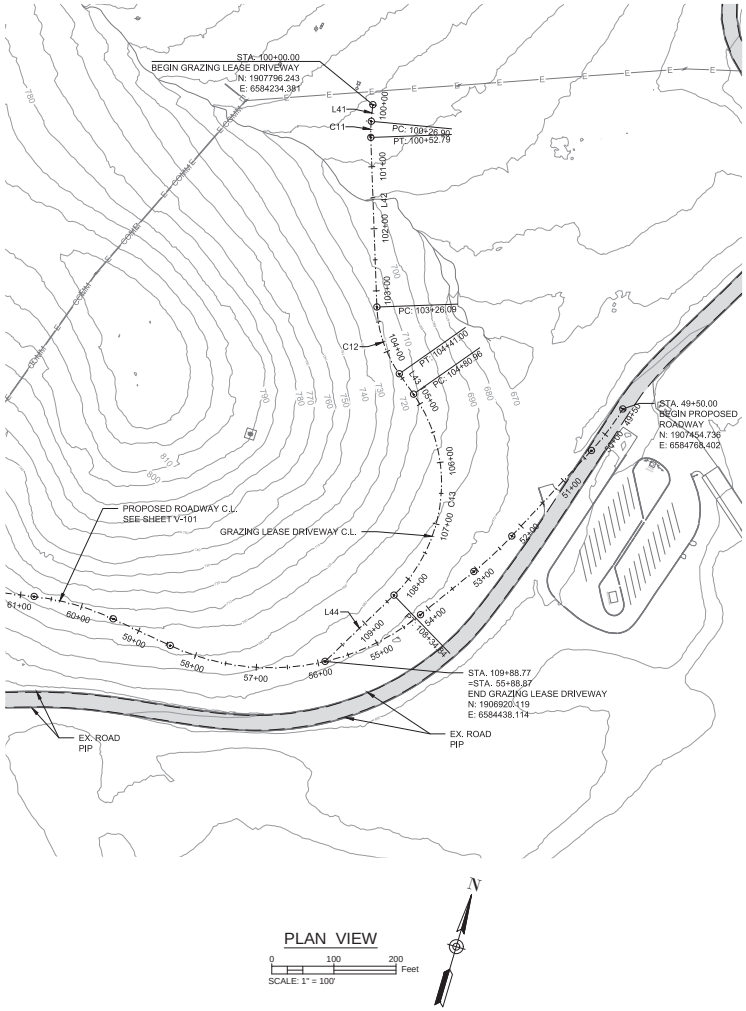

GRAZING LEASE DRIVEWAY - LINE TABLE: ALIGNMENTS		
LINE #	LENGTH	DIRECTION
L41	26.90'	S12° 38' 50.34"E
L42	273.30'	S20° 03' 52.85"E
L43	39.96'	S52° 59' 01.56"E
L44	153.93'	S28° 07' 09.95"W

GRAZING LEASE DRIVEWAY - CURVE TABLE: ALIGNMENTS					
CURVE #	LENGTH	RADIUS	DELTA	CHORD DIRECTION	CHORD LENGTH
C11	25.89'	200.00'	7°25'03"	S16° 21' 21.59"E	25.87'
C12	114.91'	200.00'	32°55'09"	S36° 31' 27.20"E	113.34'
C13	353.88'	250.00'	81°06'12"	S12° 25' 55.80"E	325.07'

US Army Corps of Engineers

MARK	DESCRIPTION	DATE

DESIGNED BY: A.GONG
DRAWN BY: K. NGUYEN
CHECKED BY: Y-H CHEN
SUBMITTED BY: A. GONG
APPD: ANS'D

ISSUE DATE:
SOLICITATION NO.
CONTRACT NO.
SPEC. NO.: 2287
FILE NAME: K:T1...09\...0372

U.S. ARMY CORPS OF ENGINEERS
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TULARE COUNTY, CALIFORNIA
TULE RIVER SPILLWAY ENLARGEMENT PROJECT
PHASE 1

GRAZING LEASE DRIVEWAY HORIZONTAL CONTROL

REGISTERED PROFESSIONAL ENGINEER
ANDY WAI GONG
No. 56484
EXP. 12-31-19
CIVIL
STATE OF CALIFORNIA

SHEET ID
V-102

TL-09-V102 SURVEY CONTROL DRWY PLAN.dwg

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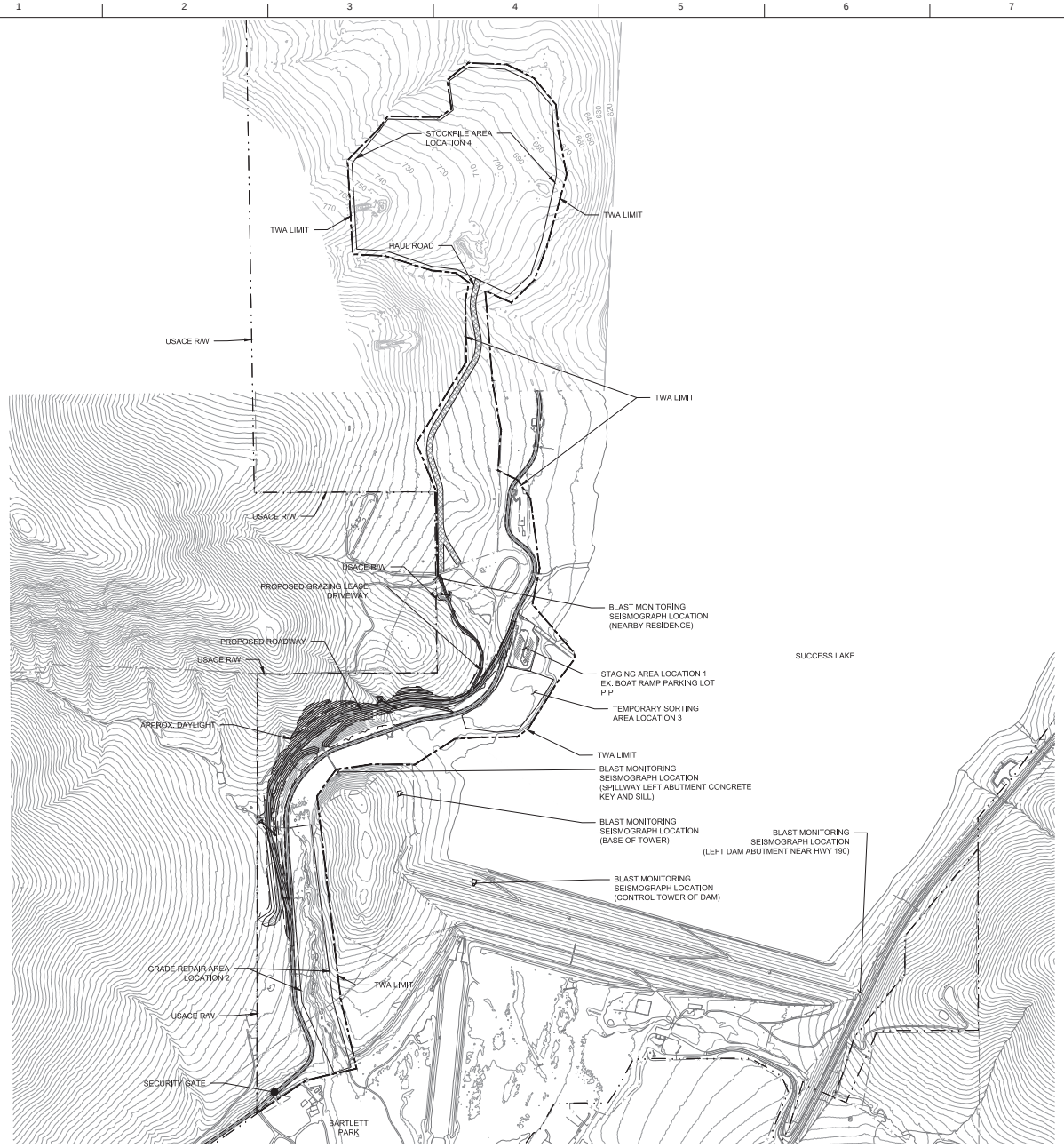

PLAN VIEW
SCALE: 1" = 400'

0 400 800 Feet
SCALE: 1" = 400'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: A.GONG	ISSUE DATE:
DRAWN BY: K. NGUYEN	SOLICITATION NO.
CHECKED BY: Y.H. CHEN	CONTRACT NO.
SUBMITTED BY: A. GONG	SPEC. NO.: 2287
APPD: ANS I D	FILE NAME: K:T1_09_ 03\T2

U.S. ARMY CORPS OF ENGINEERS
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TULARE COUNTY, CALIFORNIA
TULE RIVER SPILLWAY ENLARGEMENT PROJECT
PHASE 1

TEMPORARY WORK AREA AND BLAST MONITORING PLAN

REGISTERED PROFESSIONAL ENGINEER
ANDY WAI GONG
No. 56484
EXP. 12-31-19
CIVIL
STATE OF CALIFORNIA

SHEET ID
V-103

TL-09-V103 TEMP CONSTRUCTION AREA PLAN.dwg

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APPENDIX C

Downstream floodplain mapping analysis

DOWNSTREAM FLOODPLAIN MAPPING ANALYSIS FOR ENVIRONMENT ASSESSMENT

Date: September 30, 2019

Preparer: Cheegwan Lee, Hydraulic Design Section, Sacramento District

Reviewer: Ethan Thompson, Lead Hydraulic Engineer, DSPC, Sacramento District

[PRELIMINARY MEMO]

1.0 PURPOSE

The purpose of this study is to provide hydraulic analyses and floodplain maps of the Tule River and Tulare Lake downstream of Success Dam. The mapping is intended to be used for an Environmental Assessment for Success Dam Spillway Enlargement Project. This memo is preliminary and subject to change as the project progress.

2.0 BASIS AND ASSUMPTIONS

1) In order to limit the scope of analysis, only the floodplain from the Tule River was evaluated. Riverine floodplain from other sources were not evaluated. However, these sources are accounted for in the annual volume of water to the Tulare lakebed. The 2011 Floodplain Mapping Study for Economic Analysis (Ref. 1) used the same assumption. This assumption is reasonable because flooding in Tulare Lake from other sources is dominated by longer flood durations than the n-year event scenarios used for this study.

2) The peak snowmelt flows in the Tule River are relatively low, particularly when compared to rain floods. Therefore, only rain floods were considered in the peak flow analysis for downstream impact assessment. This is based on hydrology analysis for Success Lake.

3) The n-yr hydrology event was assumed to be a rainfall event with about 7-days duration of release per hydrology study (Ref. 6). This n-yr event was updated from the events used for 2011 floodplain mapping study (Ref. 1).

4) The n-yr discharge flow for the existing condition (denoted as “1983”) is per the current water control diagram before the with-project update (Ref. 5). These hydrographs were obtained from the Water Management Section. The discharge flow for the raised spillway condition is per the updated SPK3 water control diagram (interim) provided by the Water Management Section. No base flow was assumed. The starting pool was assumed to be at the top of conservation pool on the start date of January 15.

5) Analyses of the Tulare Lakebed storage were conducted by distributing the annual runoff volume reaching the lakebed using level pool storage assumptions. It should be noted that residual storage during multiple years was not considered and evaporation and other losses were not taken into account. The initial water level

condition is considered to be conservative as it has higher backwater effects for upstream flooding scenarios.

6) The bathymetry and survey data were based on the 2011 study model. No additional data was available except for the 2009 LiDAR data covering from Success Lake to a part of the city of Porterville. There are numerous structures (bridges, culverts, weirs) and irrigation channels and roads. It is not feasible to include all details in the large model domain with lack of detailed data. Thus, the major features (levee, bridges, weirs, major connectivity) along Tule River were approximated based on the available information. Despite potential uncertainties in the input geometry, the model is satisfactory for the purpose of environmental assessment and making a qualitative conclusion of impact (low, medium, significant). The model will provide a rough estimate of the impacted area.

7) No sequence breaching of the levee in Tulare Lakebed and other irrigation control features were assumed.

8) Historical Tule River gage data or high water mark data is unavailable. Model validation was based on primarily the 2007 prototype test (visual description) which released 3,200 cfs from the dam over a 12-hour period and the channel capacity data shown in the water control manual (Ref. 5).

9) Vertical datum is NAVD 88 feet.

3.0 INPUT DATA

1) Topographic data is based on LiDAR and DEM data available in the project area. See Figures 1 and 2. The data for the downstream area from the highway 65 to Tulare lakebed was obtained from the 2011 study (Ref. 1). The data included another LiDAR data source surveyed during 2009 (Ref. 7). The data covered the area from the Success dam to highway 65 covering the city of Porterville. The LiDAR data has inherent limitation in some spatial resolution required for the Tule river channels and levee system.

   All data was combined and resampled to appropriate spatial resolution (10-ft, 5-ft, and 3-ft) due to grid and file size limitation in the modeling. The major levee and roads may be represented pretty accurately, but some small features including weir and some narrow levees (< 10 ft) could be smoothed out in the terrain model.

   No surveys for the entire channel bathymetric data were available. The LiDAR data represents the dried channels well, but does not represent some ponded area. The 2011 study bathymetric data was developed by combining LiDAR and some available survey data.

2) Structural information was based on the 2011 study model and other missing structures in the major channels were identified and incorporated in the new model based on the aerial photos and LiDAR data using engineering judgment.

3) The selected n-yr events modeled were the 2-yr (1/2 ACE) and100-yr (1/100 ACE) with medium irrigation and snowmelt runoff. The scenarios modeled include the existing condition (“without project”) and raised spillway condition (“with project”, 10-ft raised ogee and 350-ft weir length). See Figure 3 for the discharge hydrographs from Success dam.

4) The initial water level in Tulare Lakebed for n-yr event was estimated based on item 6 in Basis and Assumptions Section 2.0. See Figure 4 for the elevation-storage curve.

4.0 TECHNICAL APPROACHES

The HEC-RAS two-dimensional (2D) hydraulic model (version 5.0.7) was used for the downstream impact analysis.

4.1 Geometry

The raster terrain data for HEC-RAS 2D model geometry was developed using RAS-Mapper. The data has 3-ft spatial resolution for the area from Success dam to the highway 65, 5-ft resolution for Tule river channel and overbank area, and 10-ft resolution for floodplain and other areas. The geometry contained hydraulic structure information. The overview of model domain and grids are shown in Figure 5. The model geometry extended from immediate downstream of Success dam to the Tulare lakebed. The grid size ranges from about 30ft in channel to 1000ft in the floodplain. The mesh size varies gradually smaller to larger from the in-channel toward outer floodplain.

A number of major roads were modeled as obstruction to flow using breaklines. The cell face lines were aligned with these features. The elevations of these features were determined from the underlining terrain data.

Due to the grid size limitation for feasible computational time, most of main flow channels were represented by single or double cells. The face lines of model mesh followed accurately the levees and major topographic features to contain flows within them. The HEC-RAS 2D model has the unique features to deal with subgrid scale topography by computing accurate storage of each grid cell based on subgrid scale terrain data. Thus, the model would generally provide a comparable level of accuracy for the water level prediction compared to the finer mesh model. Some potential concern is earlier overflow over some lowered levee sections due to smoothed terrain data. The actual levee elevations at some locations might not be accurately respresented in some levee systems narrower than the LiDAR and terrain data spatial resolution. Figure 2 shows the actual LiDAR data points in the Tule river channels.The average spatial resolution estimated to be about 10-15 ft. It is likely that the levee height might be underestimated in the sparse data points or section with narrower width. Thus, the levee overtopping occurs at the lower water level than would actually occur. However, it is considered to be conservative for Environment Assessment (EA) because it could result in a larger flooding impact area.

4.2 Structures

Fourty (40) road and railroad bridges and six (6) weirs and eleven (11) culverts crossing the Tule River from Success Dam to Hwy 99 were included in the HEC-RAS model. See

Figure 5 for the locations. The bridges were represented as equivalent culverts because the current version of HEC-RAS 2D model does not have capability to model the bridge structure such as in the 1D model. However, the hydraulic representation of both structures (culvert vs bridge) are very similar in model formulation as long as the flow area and invert elevations are equivalent. All the bridge structures were incorporated as hydraulically equivalent culverts based on the information extracted from the 2011 study model. The structures in the 2011 study were ground surveyed. There are some newly identified structures such as weir and culverts which do not have survey information. The hydraulic parameters for these newly identified structures were estimated based on the terrain and aerial photography, and engineering judgement.

4.3 Manning's Roughness

Manning's n value for Tule River channel was based on the 2011 study. The values were initially estimated during a sit visit conducted 23-25 June 2009 and some adjustments were made during the model validation process. Manning's n values for the floodplain were estimated based on National Land Cover Database (NLCD) 2016. See Figure 7 for Manning's n distribution for the entire model domain. Below are the Manning's n values for critical flow paths anticipated.

- Main channel: n=0.04
- Overbank: n=0.08
- Cultivated Crops: n=0.06

4.4 Initial and Boundary Condition

The initial conditions for the hydraulic modeling are the n-yr water levels in the Tulare lakebed based on the assumption in Section 2.0. See Figure 4 for the elevation-storage curve for Tulare lakebed and water level value used in the below table.

n-yr Event	Annual Runoff Volume (acre-ft) from all tributary sources	Estimated Initial Condition Water Level (ft-NAVD 88)
1/2 ACE (2-yr)	2,000	174.8
1/100 ACE (100-yr)	1,980,000	193.5

The HEC-RAS upstream boundary conditions for the "Without Project" and "With Project" consisted of discharge flow hydrographs developed by Water Management Section as shown in Figure 3. The "Without Project" condition routed the n-yr inflow hydrograph using Success Lake reservoir model based on the existing (1983) water control diagram. The "With Project" condition routed the n-yr inflow hydrograph using the same reservoir model based on the updated SPK3 (interim) water control diagram. Both conditions assumed the start day is January 15. A primary difference in the water control diagrams is the increase in Schedule 1 base storage from 7,300 acre-ft to 12,000 acre-ft after the spillway raise. This change means the same n-yr event is expected to release less water for "With Project" condition as shown in Figure 3. There is no discharge for 2-yr events assuming no base flow.

4.5 Model Validation

Historical Tule River gage or high water mark data were unavailable. Model validation was based primarily on the downstream channel capacities and the 2007 prototype test, which released 3,200 cfs from the dam over a 12-hour period. See Figure 8A for the downstream channel capacity map from the 1983 Water Control Manual. The validation targets from the observation are summarized as follows:

- The Tule River channel capacity from Success dam to the forks (i.e. two branches) is much greater than 3,200 cfs. The capacity is in the range of 7,000 to 10,000 cfs. Thus, the released water remains in channel in this reach.
- The combined channel capacity (2,800 cfs) for the north and south branches are close to but smaller than the released flow. Thus, some released flow could overtop some section of channel bank.
- The channel capacity downstream of the confluence of two branches is about 1,200 cfs which is much smaller than the released flow.
- The flow distribution at the north and south branch typically splits fairly even.

Figure 8B shows the model prediction with the release of 3,200 cfs from the dam. The prediction matches the overall observations. The flows in the upstream river section remained in the channel. There was some overbank flooding in the branch area and downstream section. In addition, the flow split to north and south branches remained even. There might be some over-prediction of the flooded area due to the limitation of topographic spatial resolution as discussed previously. However, the project model is reasonable to achieve the purpose of this task.

5.0 RESULTS

Four scenarios were proposed for this study as follow:

- Scenario 1: 100-yr event for “Without Project” condition (i.e. existing condition)
- Scenario 2: 100-yr event for “With Project” condition (i.e. raised spillway condition)
- Scenario 3: 2-yr event for “Without Project” condition (i.e. existing condition)
- Scenario 4: 2-yr event for “With Project” condition (i.e. raised spillway condition)

Figures 9 and 10 show the maximum flood extents and depths for Scenario 1 and 2 respectively. No significant difference in terms of flooding extent was recognized between the two scenarios (without project compared to with-project). However, Scenario 2 (with-project) decreased the flooding extent because of the reduced discharge volume due to the raised spillway. The difference in the maximum water level varied along Tule River from upstream to downstream. In the upstream reach from the dam to the split, the water level for project condition was consistently lower in the range of 0.5 to 1.5 ft depending on the location and channel width. In the branches downstream of the split, the same trend was observed, but the difference was reduced to less than 0.5 ft as the excessive

flood water overtopped into the floodplain. Further downstream, the difference becomes much smaller. No quantitative estimate of change in the flooding area was made herein but it should be much less than the release flow volume difference (3884 acre-ft) in the discharge flow rates in Figure 3.

Both scenarios show no significant flooding in the area from the dam to the river split. There is scattered flooding area in East Porterville downstream of the dam. Based upon further investigation, that flooded area seems not accurate and was probably caused by a large size grid that connects hydraulically Tule River to the adjacent ditch flowing to East Porterville. No hydraulic structure was identified from the aerial photo. Potential improvement may be necessary if the flooding of this area is a concern.

The resulting plots indicate some potential flooding in the downstream area of the split caused by the reduced channel capacity. It should be noted for some potential over-prediction of residual flooding due to the smoothed (i.e. lowered) levee elevation in filtering process of the LiDAR data to develop the raster terrain data. But there are other uncertainties caused by the lack of detailed structural information such as weirs and culverts in the area. A higher or lower actual weir crest can easily create additional or reduced backwater elevations that can affect the levee overtopping.

No model runs were performed for Scenarios 3 and 4 because no flow is released for the 2-yr event. This means that the project condition has no impact on the downstream river and floodplain relative to the without project condition.

6.0 REFERENCES

1. USACE, 2011, Success Dam Seismic Remediation San Joaquin Valley, California, Floodplain Mapping Study for Economic Analysis.
2. USACE, 2010, Success Dam and Lake Tule River, California, Flood Plain Hydrology Report.
3. USACE, 1999, Final Feasibility Report and Final Environmental Impact Statement/Environmental Impact Report.
4. USACE, May 2018, Level 3 Economic Update, Success Dam & Lake Spillway Enlargement Project, Tule River, CA.
5. USACE, 1982, Water Control Manual.
6. USACE, 2012, Success Dam Safety Final Hydrology Report.
7. Optimal Geomatics, 2009, Lake Success LiDAR Survey.

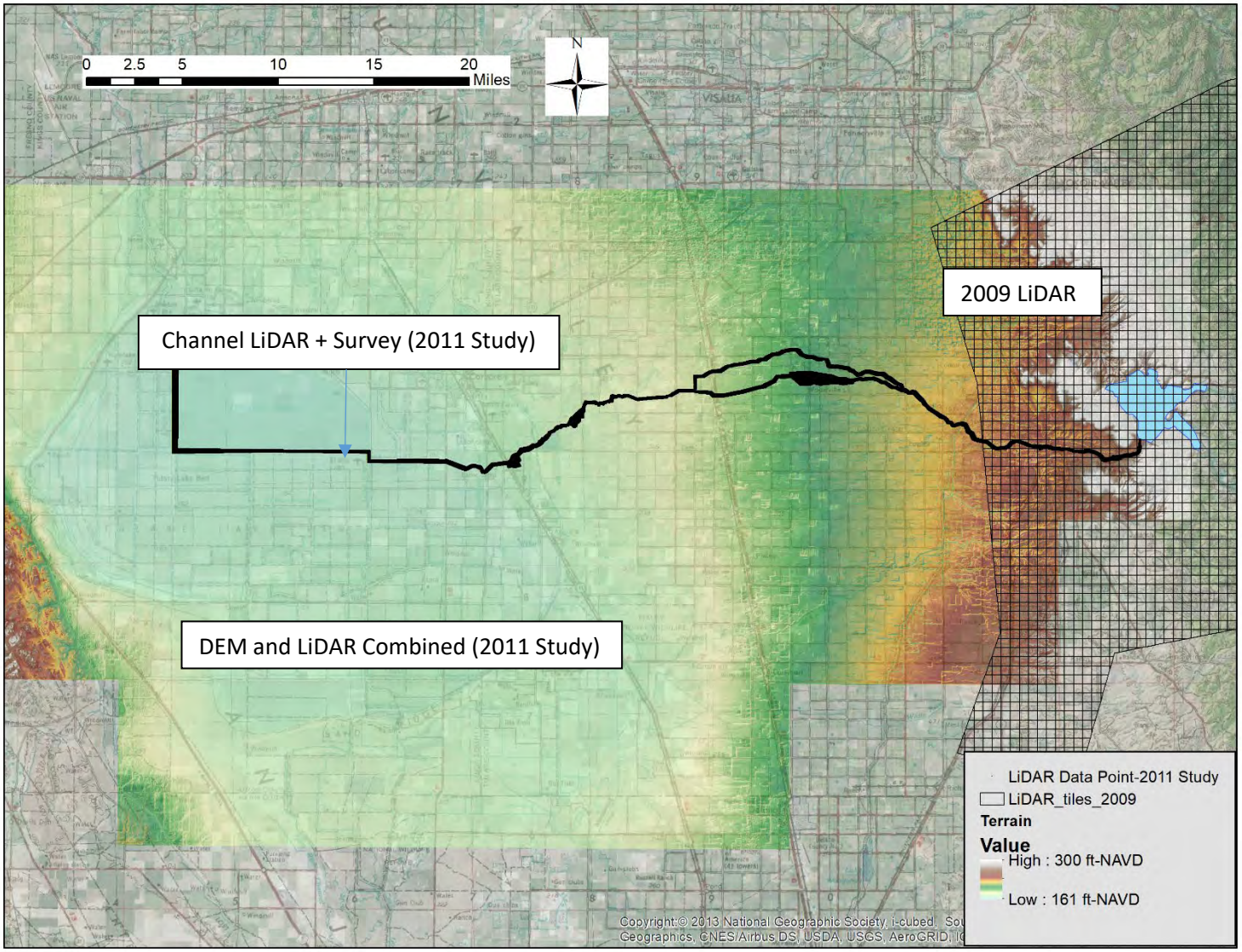

Figure 1- LiDAR and DEM Data Source and Coverage.`

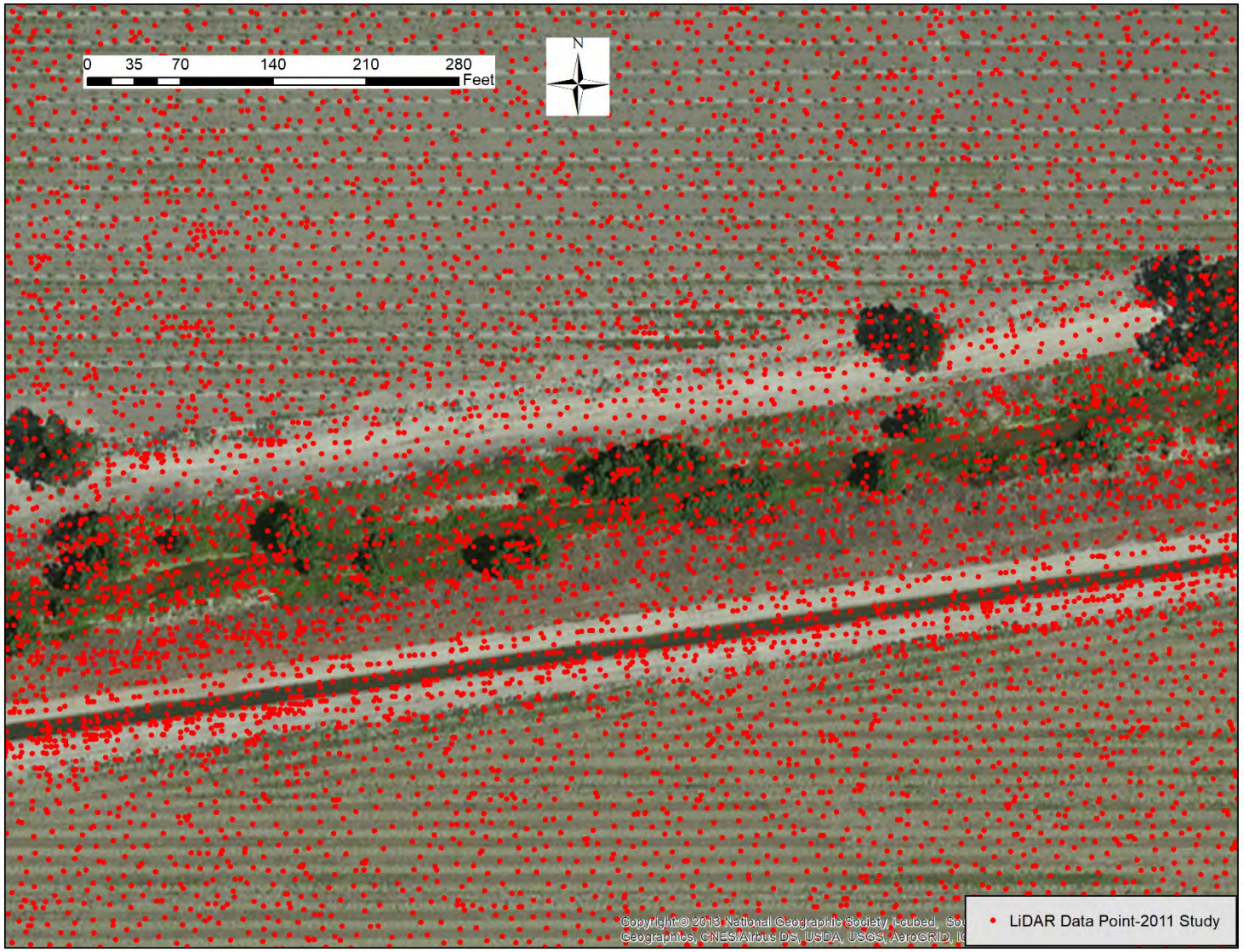

Figure 2- LiDAR Data Points on Tule River Channel Section.

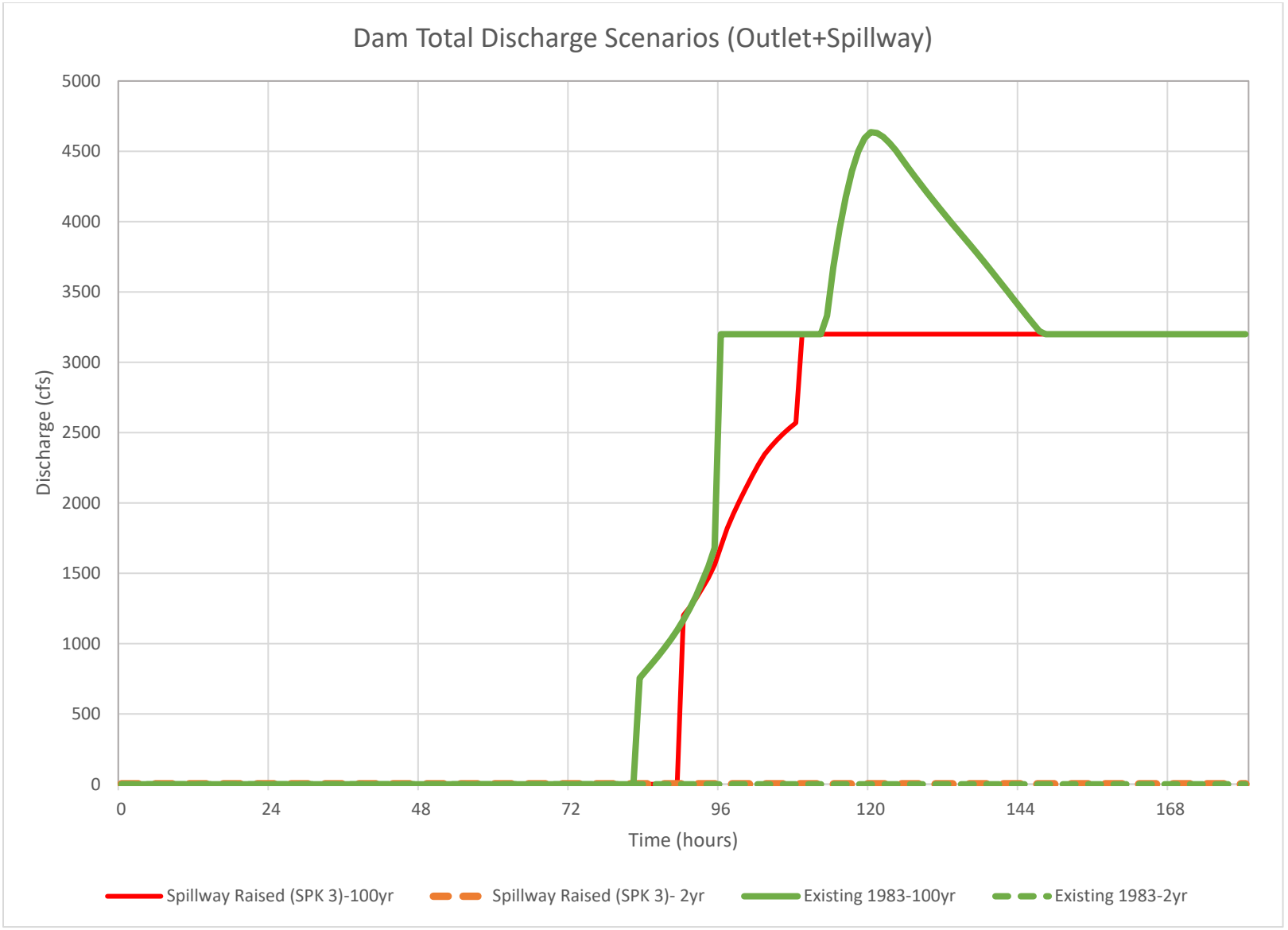

Figure 3- Total Discharge (Outlet + Spillway) from Success Lake for Existing and Spillway Raised (SPK3) Condition.

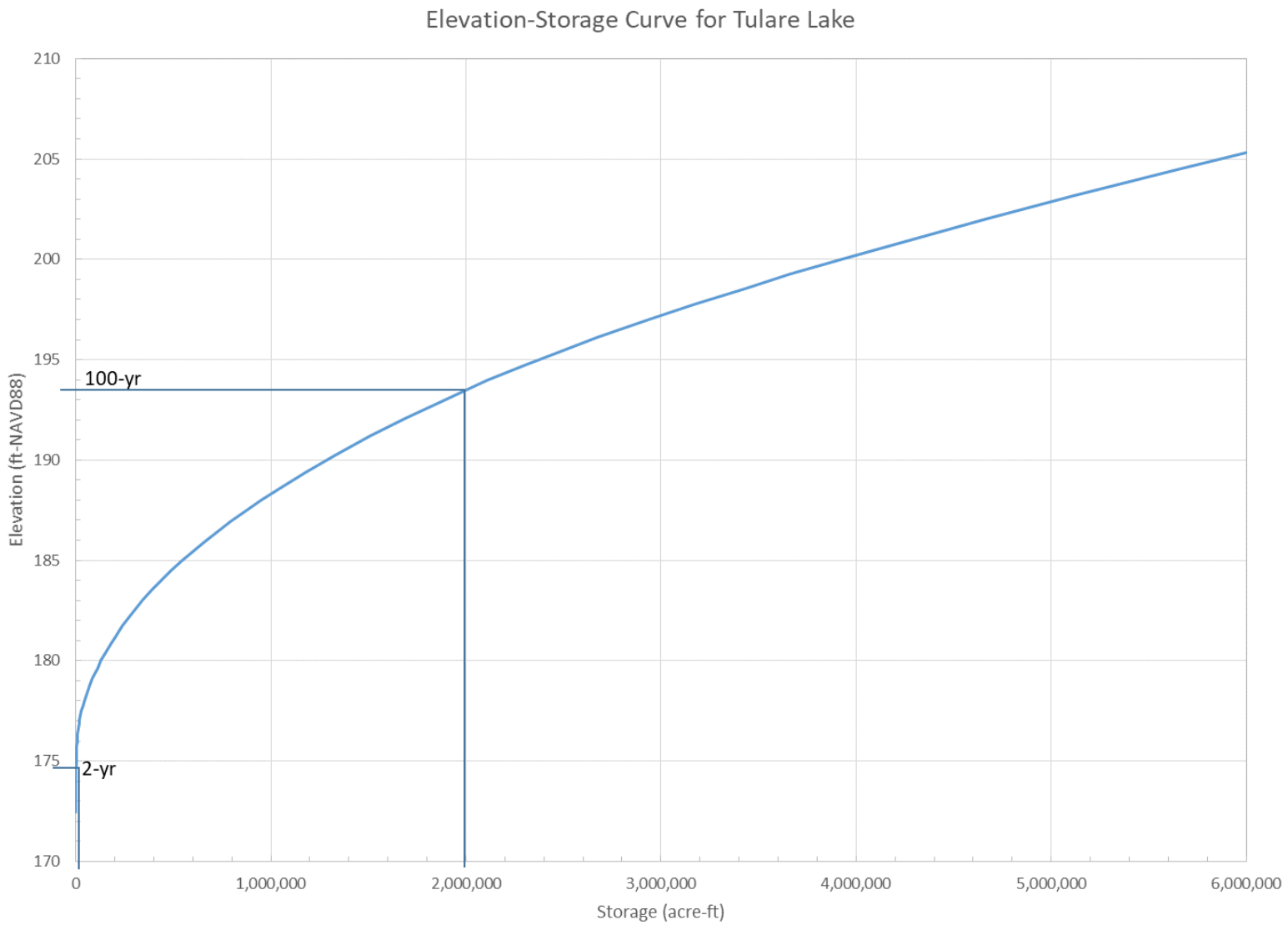

Figure 4- Elevation Storage Curve for Tulare Lake (Estimated from HEC-RAS Terrain Data).

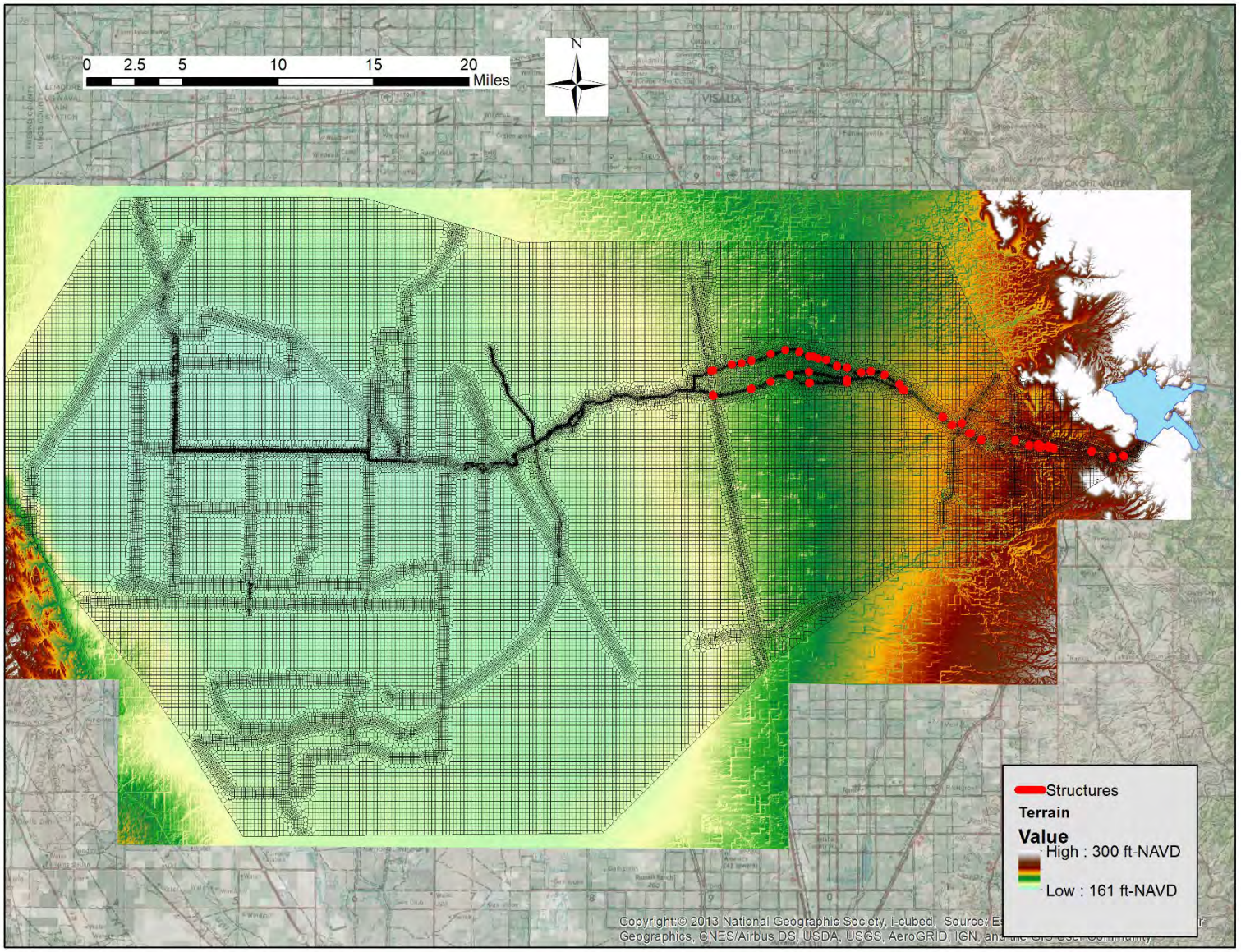

Figure 5- HEC-RAS 2D Model Domain and Terrain-Overview.

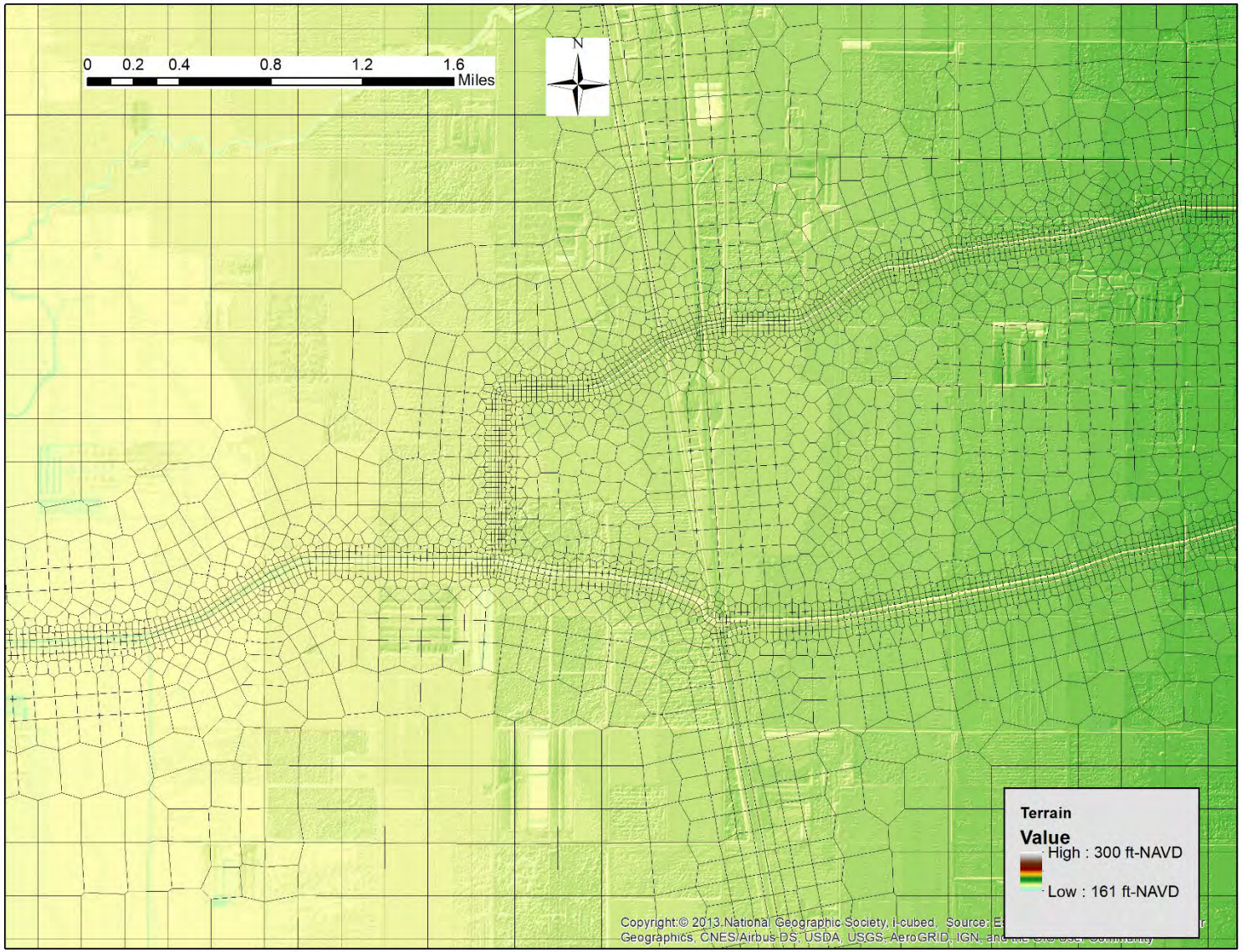

Figure 6- HEC-RAS 2D Model Mesh-Tule River Section.

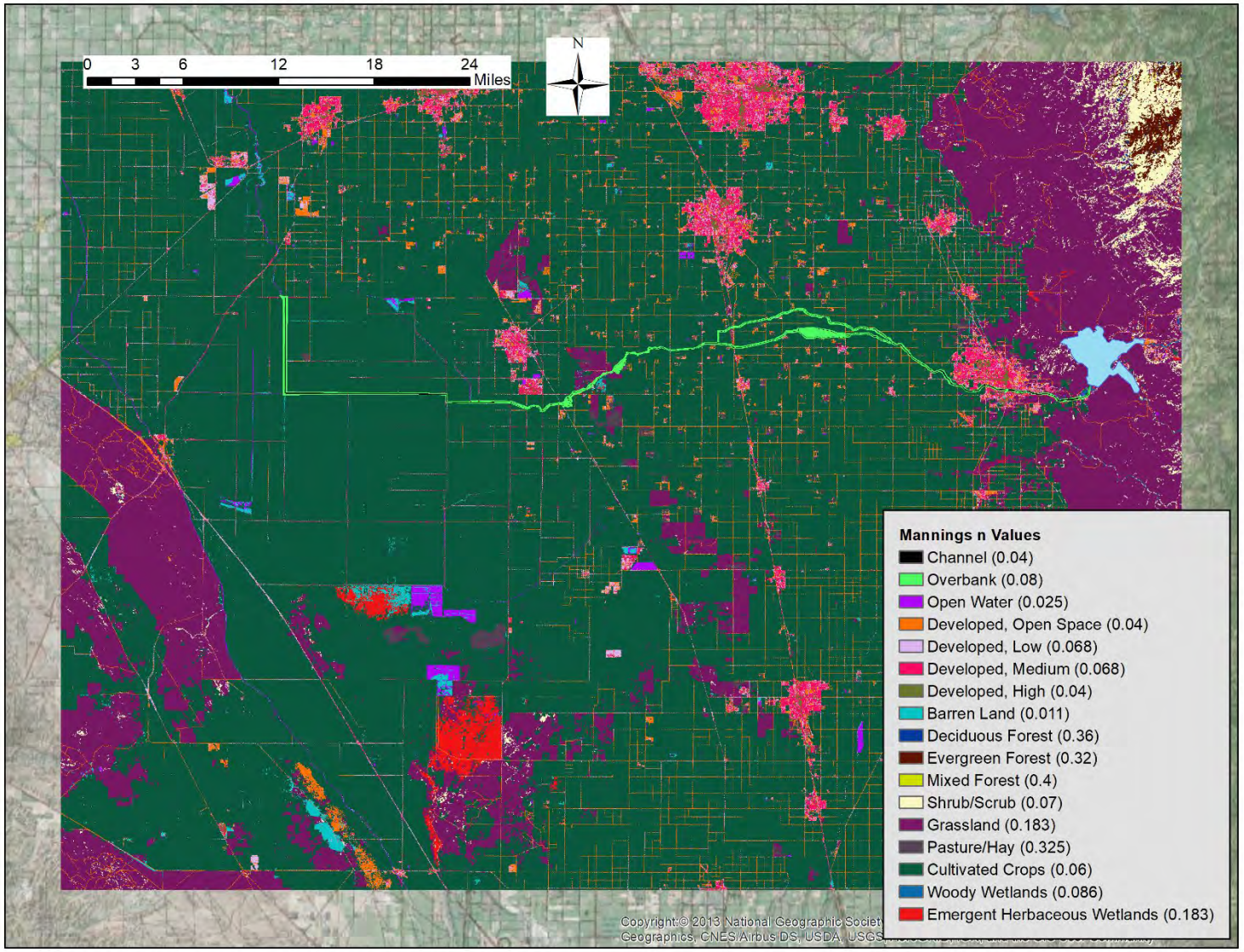

Figure 7- Manning n values (NLCD 2016).

DIVERSIONS AND CAPACITIES

	CANAL OR DITCH	CAPACITY (c.f.s.)
1	Pioneer Ditch	35
2	Campbell-Moreland	30
3	Porter Slough	180
4	Porter Slough Ditch	20
5	Vandalia Ditch	9
6	Poplar Ditch	150
7	Hubbs-Miner Ditch Rhodes and Fine Ditch	25 a/
8	Woods-Central Ditch (Woods-Central Canal) Stockton Ditch Little Pioneer Ditch	250 b/ b/
9	North Canal	300
	SUBTOTAL	999
10	East Branch Lakeland Canal	c/ 300
11	Taylor Ditch	65
	GRAND TOTAL	1,364

a/ Rhodes and Fine Ditch has been combined with Hubbs-Miner Ditch and Poplar Ditch.

b/ Stockton Ditch and Little Pioneer Ditch have been combined with Woods-Central Ditch.

c/ Canal enlargement to 550 c.f.s. under construction.

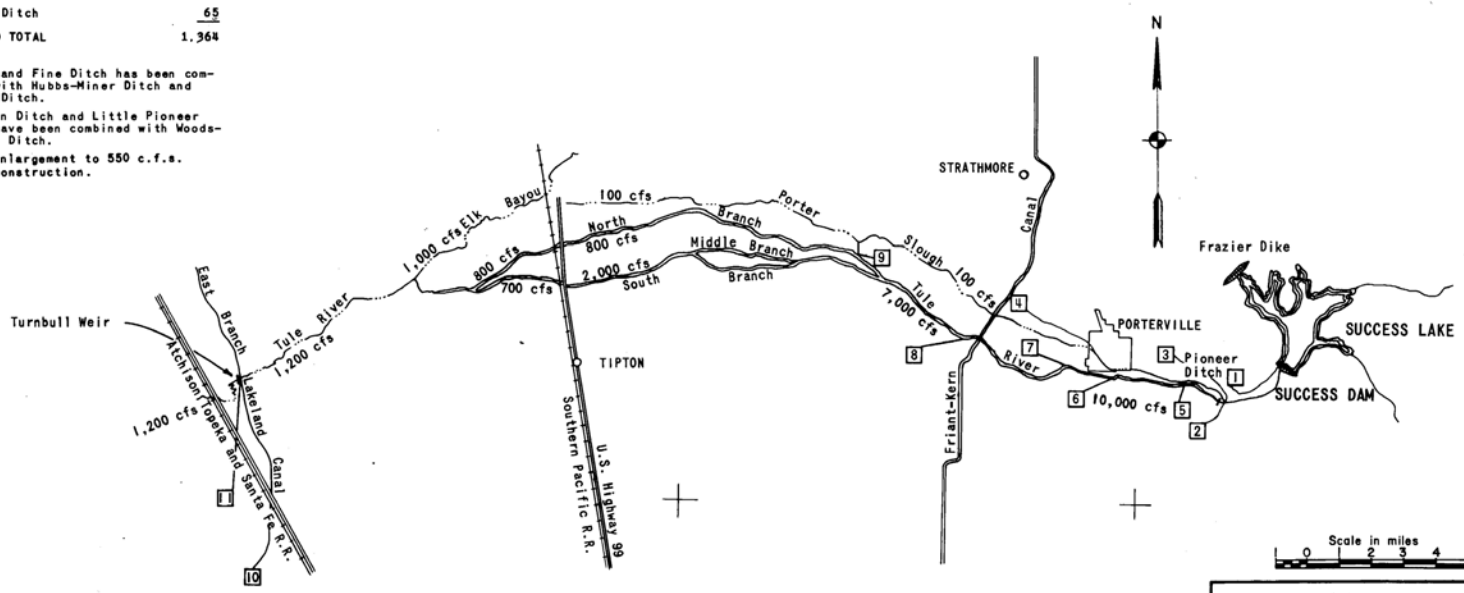

Figure 8A- Downstream Channel Capacities (source: 1983 Water Control Manual)

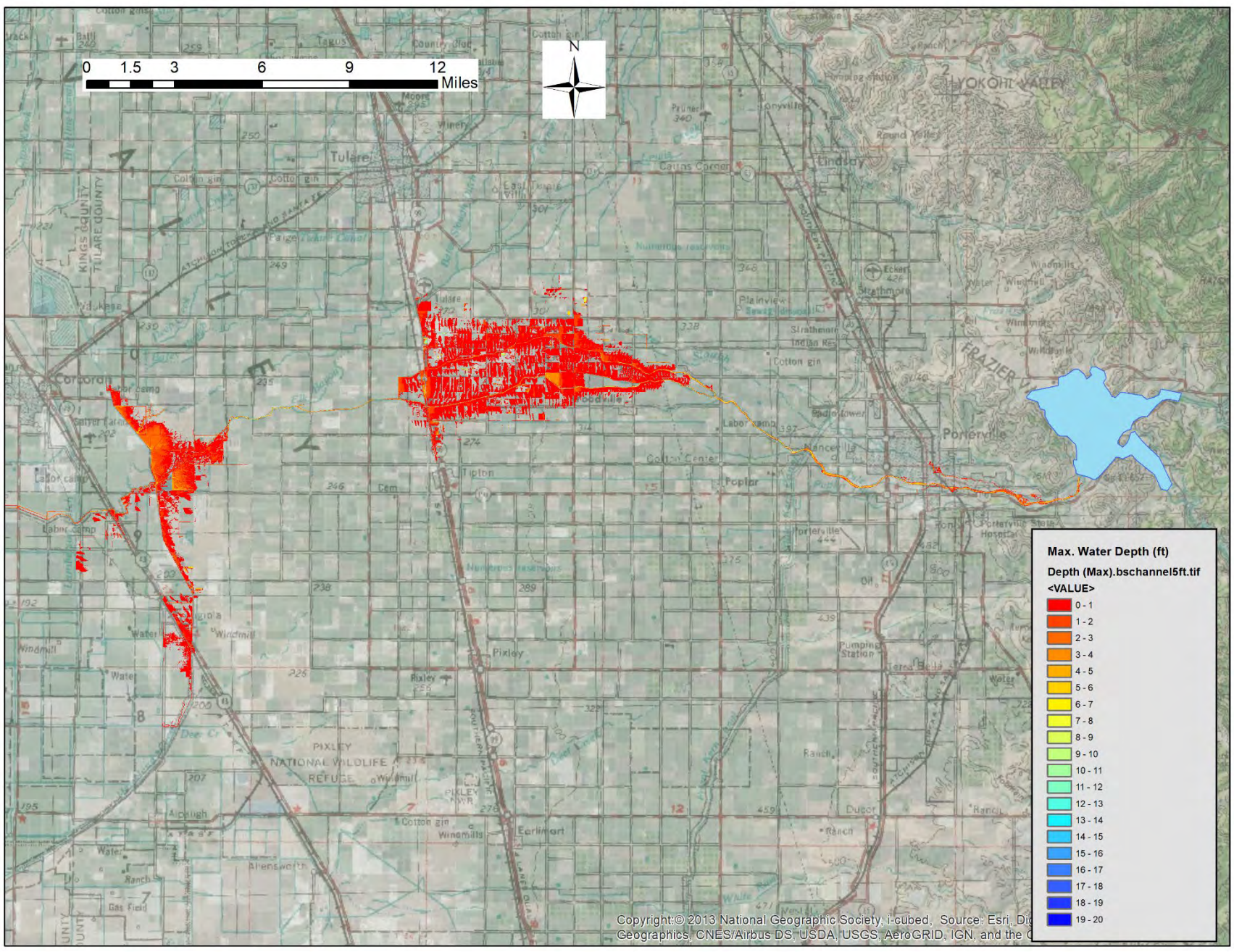

Figure 8B- Model Validation Simulation with 3,200 cfs release during 12 hours.

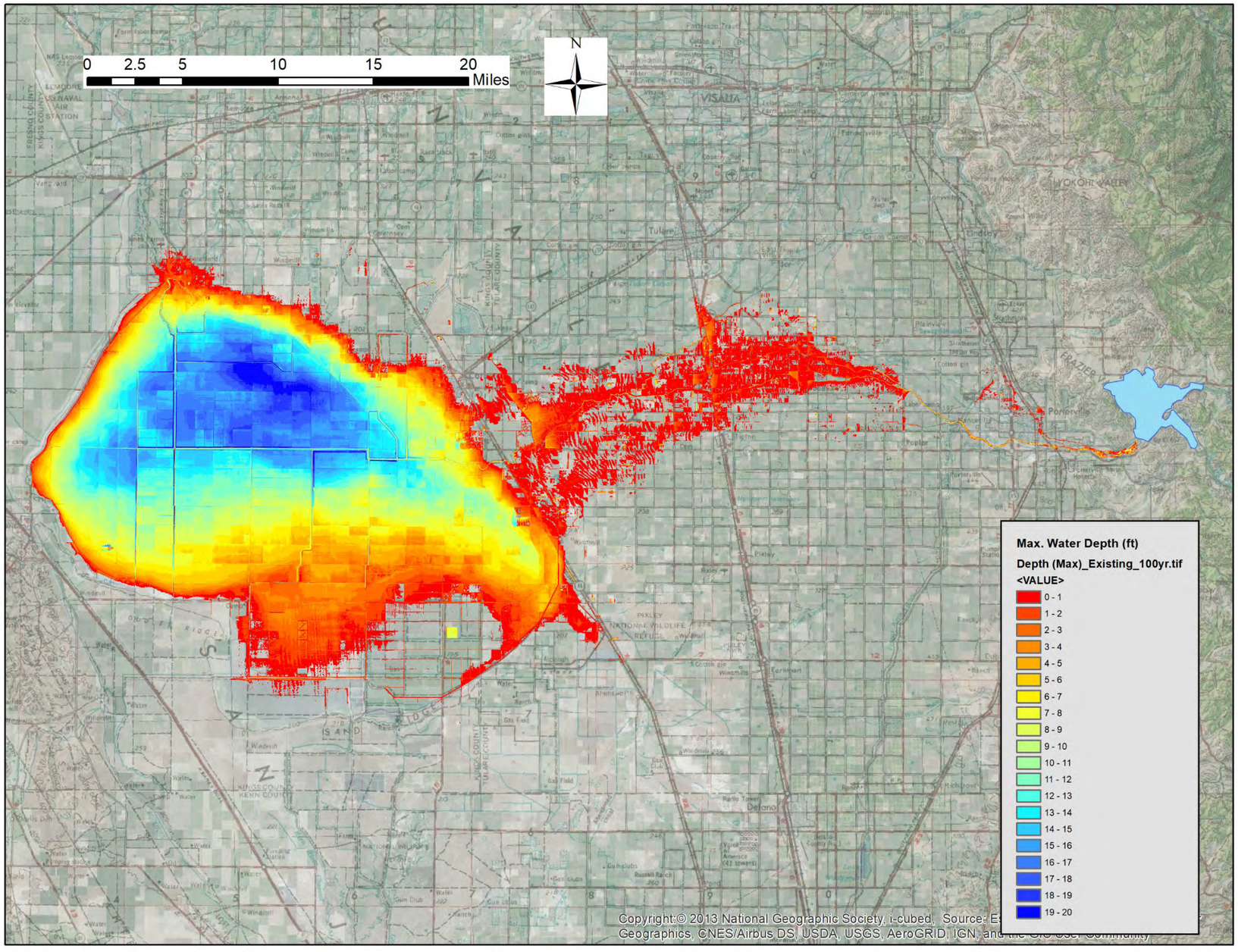

Figure 9- Maximum Flooding Extents and Depth- Without Project Condition (1983 WCD) for 100-yr Event.

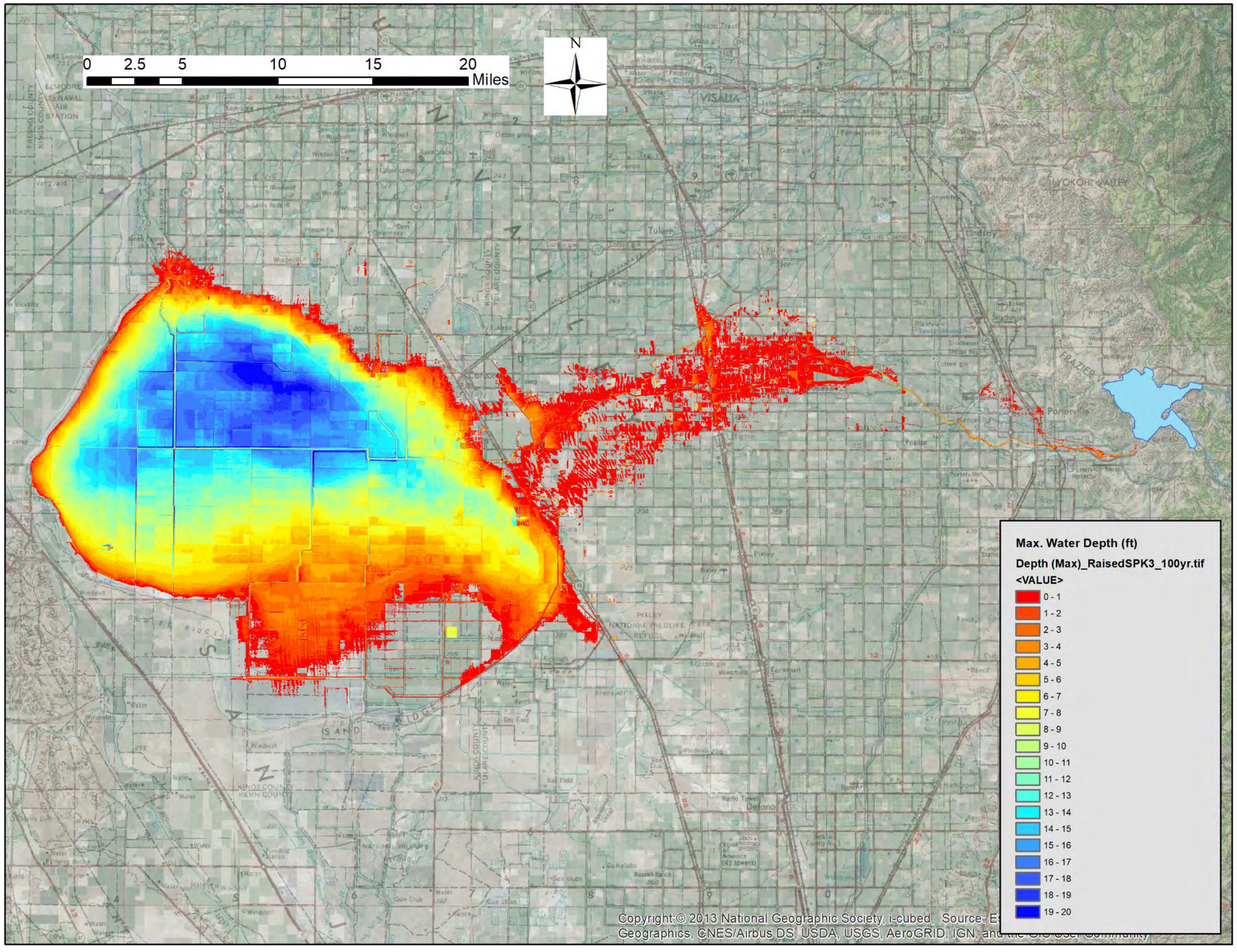

Figure 10- Maximum Flooding Extents and Depth- With Project Condition (SPK3 WCD) for 100-yr Event.