

**DRAFT INITIAL STUDY AND  
MITIGATED NEGATIVE DECLARATION**

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**CITY OF CHOWCHILLA**  
**FAIRMEAD – CHOWCHILLA**  
**WASTEWATER TREATMENT**  
**FACILITY CONNECTION PROJECT**



**JANUARY 2021**

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**DRAFT INITIAL STUDY AND  
MITIGATED NEGATIVE DECLARATION**

**FAIRMEAD – CHOWCHILLA  
WASTEWATER TREATMENT  
FACILITY CONNECTION PROJECT**

**Prepared for:**

City of Chowchilla  
130 S Second Street  
Chowchilla, CA 93610  
Phone: 559-665-8615

**Consultant:**



2816 Park Avenue  
Merced, CA 95348  
Contact: Spencer Supinger  
Phone: (209) 723-2066  
Fax: (209) 723-0957

January 2021





Identify the project's significant or potentially significant effects and briefly describe any proposed mitigation measures that would reduce or avoid that effect.

See mitigation measures provided.

*Revised September 2011*

If applicable, describe any of the project's areas of controversy known to the Lead Agency, including issues raised by agencies and the public.

There are no known areas of controversey.

Provide a list of the responsible or trustee agencies for the project.

SJVAPCD  
United States Dept. of Fish and Wildlife  
California Dept. of Fish and Wildlife Region #4  
Regional WQCB #5F  
City of Chowchilla  
County of Madera

NOTICE OF INTENT TO ADOPT A MITIGATED NEGATIVE DECLARATION  
FOR FAIRMEAD-CHOWCHILLA WASTEWATER TREATMENT FACILITY PROJECT

NOTICE IS HEREBY GIVEN that the City of Chowchilla is circulating for public review an Initial Study/Mitigated Negative Declaration (IS/MND) in accordance with the California Environmental Quality Act (CEQA) for the proposed Wastewater system improvements.

**PROJECT LOCATION:** The unincorporated Community of Fairmead located roughly in the center of the San Joaquin Valley in Madera County on the east side of State Route (SR) 99 just south of SR 152 and the Chowchilla Wastewater Treatment Facility located in Chowchilla, CA.

**PROJECT DESCRIPTION:** Fairmead is provided domestic water and light services by Madera County's Maintenance District 33. However, properties within Fairmead rely on individual septic systems for sewer service. Wastewater in the Community is disposed of through the use of onsite septic tanks and leach fields or pits. There is no sanitary sewer collection system or wastewater treatment facility in the Community, or immediately adjacent to it. Potential for contamination of groundwater supplies has caused the State and County to request that the City of Chowchilla consider connecting Fairmead to the City's existing wastewater treatment facility. This would require construction of a sewer collection system and transmission line from Fairmead to Chowchilla.

The proposed project would abandon the septic tanks and leach fields in Fairmead and direct wastewater flows through a new sewer trunk line to the City of Chowchilla's Wastewater Treatment Facility (WWTF) (Project). Approximately 175 residential connections, the Fairmead Elementary School, and a commercial property will be connected to the City of Chowchilla's WWTF. The proposed Project includes a collection system, pump station, force main and gravity main with wastewater treatment and disposal at the existing City of Chowchilla WWTF.

Construction is anticipated to begin in April 2022 and would take approximately 7 months and finish in November 2022. All pipeline segments and Project components are anticipated to be built out simultaneously.

**PUBLIC REVIEW:** The Chowchilla City Council is making the proposed IS/MND available to interested agencies and members of the public for review and comment. A 30-day public review period will begin on January 30th and end on March 9th.

**DOCUMENT AVAILABILITY:** The IS/MND and separately bound appendices is available for review during regular business hours at Chowchilla City Hall at 130 S 2<sup>nd</sup> St in Chowchilla and at the Chowchilla Branch Library at 300 Kings Avenue in Chowchilla. Written comments may be submitted to Jason Rogers at the above address prior to the end of the public review period.

A meeting of the Chowchilla City Council Members will be held to consider the approval of the Draft Mitigated Negative Declaration at the City Hall (see address above) on March 9th at 7PM or as soon thereafter as may be heard.

For additional information, please call Jason Rogers, Director of Public Works at (559) 665-8615.

**Notice of Completion & Environmental Document Transmittal**

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613  
 For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

<b>SCH #</b>
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**Project Title:** \_\_\_\_\_

Lead Agency: \_\_\_\_\_ Contact Person: \_\_\_\_\_

Mailing Address: \_\_\_\_\_ Phone: \_\_\_\_\_

City: \_\_\_\_\_ Zip: \_\_\_\_\_ County: \_\_\_\_\_

**Project Location:** County: \_\_\_\_\_ City/Nearest Community: \_\_\_\_\_

Cross Streets: \_\_\_\_\_ Zip Code: \_\_\_\_\_

Longitude/Latitude (degrees, minutes and seconds): \_\_\_\_\_° \_\_\_\_\_' \_\_\_\_\_" N / \_\_\_\_\_° \_\_\_\_\_' \_\_\_\_\_" W Total Acres: \_\_\_\_\_

Assessor's Parcel No.: \_\_\_\_\_ Section: \_\_\_\_\_ Twp.: \_\_\_\_\_ Range: \_\_\_\_\_ Base: \_\_\_\_\_

Within 2 Miles: State Hwy #: \_\_\_\_\_ Waterways: \_\_\_\_\_

Airports: \_\_\_\_\_ Railways: \_\_\_\_\_ Schools: \_\_\_\_\_

**Document Type:**

CEQA: <input type="checkbox"/> NOP	<input type="checkbox"/> Draft EIR	NEPA: <input type="checkbox"/> NOI	Other: <input type="checkbox"/> Joint Document
<input type="checkbox"/> Early Cons	<input type="checkbox"/> Supplement/Subsequent EIR	<input type="checkbox"/> EA	<input type="checkbox"/> Final Document
<input type="checkbox"/> Neg Dec	(Prior SCH No.) _____	<input type="checkbox"/> Draft EIS	<input type="checkbox"/> Other: _____
<input type="checkbox"/> Mit Neg Dec	Other: _____	<input type="checkbox"/> FONSI	_____

**Local Action Type:**

<input type="checkbox"/> General Plan Update	<input type="checkbox"/> Specific Plan	<input type="checkbox"/> Rezone	<input type="checkbox"/> Annexation
<input type="checkbox"/> General Plan Amendment	<input type="checkbox"/> Master Plan	<input type="checkbox"/> Prezone	<input type="checkbox"/> Redevelopment
<input type="checkbox"/> General Plan Element	<input type="checkbox"/> Planned Unit Development	<input type="checkbox"/> Use Permit	<input type="checkbox"/> Coastal Permit
<input type="checkbox"/> Community Plan	<input type="checkbox"/> Site Plan	<input type="checkbox"/> Land Division (Subdivision, etc.)	<input type="checkbox"/> Other: _____

**Development Type:**

<input type="checkbox"/> Residential: Units _____ Acres _____	<input type="checkbox"/> Transportation: Type _____
<input type="checkbox"/> Office: Sq.ft. _____ Acres _____ Employees _____	<input type="checkbox"/> Mining: Mineral _____
<input type="checkbox"/> Commercial: Sq.ft. _____ Acres _____ Employees _____	<input type="checkbox"/> Power: Type _____ MW _____
<input type="checkbox"/> Industrial: Sq.ft. _____ Acres _____ Employees _____	<input type="checkbox"/> Waste Treatment: Type _____ MGD _____
<input type="checkbox"/> Educational: _____	<input type="checkbox"/> Hazardous Waste: Type _____
<input type="checkbox"/> Recreational: _____	<input type="checkbox"/> Other: _____
<input type="checkbox"/> Water Facilities: Type _____ MGD _____	

**Project Issues Discussed in Document:**

<input type="checkbox"/> Aesthetic/Visual	<input type="checkbox"/> Fiscal	<input type="checkbox"/> Recreation/Parks	<input type="checkbox"/> Vegetation
<input type="checkbox"/> Agricultural Land	<input type="checkbox"/> Flood Plain/Flooding	<input type="checkbox"/> Schools/Universities	<input type="checkbox"/> Water Quality
<input type="checkbox"/> Air Quality	<input type="checkbox"/> Forest Land/Fire Hazard	<input type="checkbox"/> Septic Systems	<input type="checkbox"/> Water Supply/Groundwater
<input type="checkbox"/> Archeological/Historical	<input type="checkbox"/> Geologic/Seismic	<input type="checkbox"/> Sewer Capacity	<input type="checkbox"/> Wetland/Riparian
<input type="checkbox"/> Biological Resources	<input type="checkbox"/> Minerals	<input type="checkbox"/> Soil Erosion/Compaction/Grading	<input type="checkbox"/> Growth Inducement
<input type="checkbox"/> Coastal Zone	<input type="checkbox"/> Noise	<input type="checkbox"/> Solid Waste	<input type="checkbox"/> Land Use
<input type="checkbox"/> Drainage/Absorption	<input type="checkbox"/> Population/Housing Balance	<input type="checkbox"/> Toxic/Hazardous	<input type="checkbox"/> Cumulative Effects
<input type="checkbox"/> Economic/Jobs	<input type="checkbox"/> Public Services/Facilities	<input type="checkbox"/> Traffic/Circulation	<input type="checkbox"/> Other: _____

**Present Land Use/Zoning/General Plan Designation:**

**Project Description:** (please use a separate page if necessary)

## Reviewing Agencies Checklist

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with and "X".  
If you have already sent your document to the agency please denote that with an "S".

<input checked="" type="checkbox"/> Air Resources Board	<input type="checkbox"/> Office of Historic Preservation
<input type="checkbox"/> Boating & Waterways, Department of	<input type="checkbox"/> Office of Public School Construction
<input type="checkbox"/> California Emergency Management Agency	<input type="checkbox"/> Parks & Recreation, Department of
<input type="checkbox"/> California Highway Patrol	<input type="checkbox"/> Pesticide Regulation, Department of
<input checked="" type="checkbox"/> Caltrans District # <u>6</u>	<input type="checkbox"/> Public Utilities Commission
<input type="checkbox"/> Caltrans Division of Aeronautics	<input checked="" type="checkbox"/> Regional WQCB # <u>5F</u>
<input type="checkbox"/> Caltrans Planning	<input type="checkbox"/> Resources Agency
<input type="checkbox"/> Central Valley Flood Protection Board	<input type="checkbox"/> Resources Recycling and Recovery, Department of
<input type="checkbox"/> Coachella Valley Mtns. Conservancy	<input type="checkbox"/> S.F. Bay Conservation & Development Comm.
<input type="checkbox"/> Coastal Commission	<input type="checkbox"/> San Gabriel & Lower L.A. Rivers & Mtns. Conservancy
<input type="checkbox"/> Colorado River Board	<input type="checkbox"/> San Joaquin River Conservancy
<input type="checkbox"/> Conservation, Department of	<input type="checkbox"/> Santa Monica Mtns. Conservancy
<input type="checkbox"/> Corrections, Department of	<input type="checkbox"/> State Lands Commission
<input type="checkbox"/> Delta Protection Commission	<input type="checkbox"/> SWRCB: Clean Water Grants
<input type="checkbox"/> Education, Department of	<input checked="" type="checkbox"/> SWRCB: Water Quality
<input type="checkbox"/> Energy Commission	<input type="checkbox"/> SWRCB: Water Rights
<input checked="" type="checkbox"/> Fish & Game Region # <u>4</u>	<input type="checkbox"/> Tahoe Regional Planning Agency
<input type="checkbox"/> Food & Agriculture, Department of	<input checked="" type="checkbox"/> Toxic Substances Control, Department of
<input type="checkbox"/> Forestry and Fire Protection, Department of	<input checked="" type="checkbox"/> Water Resources, Department of
<input type="checkbox"/> General Services, Department of	<input type="checkbox"/> Other: _____
<input type="checkbox"/> Health Services, Department of	<input type="checkbox"/> Other: _____
<input type="checkbox"/> Housing & Community Development	
<input checked="" type="checkbox"/> Native American Heritage Commission	

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### Local Public Review Period (to be filled in by lead agency)

Starting Date \_\_\_\_\_ Ending Date \_\_\_\_\_

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### Lead Agency (Complete if applicable):

Consulting Firm: \_\_\_\_\_ Applicant: \_\_\_\_\_  
Address: \_\_\_\_\_ Address: \_\_\_\_\_  
City/State/Zip: \_\_\_\_\_ City/State/Zip: \_\_\_\_\_  
Contact: \_\_\_\_\_ Phone: \_\_\_\_\_  
Phone: \_\_\_\_\_

---

Signature of Lead Agency Representative: \_\_\_\_\_

Date: 1/27/2021

Authority cited: Section 21083, Public Resources Code. Reference: Section 21161, Public Resources Code.



## **NOTICE OF PUBLIC HEARING AND INTENT TO ADOPT A MITIGATED NEGATIVE DECLARATION**

This is to advise that the City of Chowchilla has prepared a Mitigated Negative Declaration for the Project identified below that is scheduled to be held at the City of Chowchilla meeting on March 9th, 2021.

PLEASE BE ADVISED that the Chowchilla City Council will consider adopting the Mitigated Negative Declaration at the Board's meeting to be held on March 9th, 2021. Presentations will be made at approximately 7PM. Action on items on the board agenda will occur after the presentations. The meeting will be held at Chowchilla City Hall at 130 S 2<sup>nd</sup> Street in Chowchilla.

### ***Project Name***

Fairmead – Chowchilla Wastewater Treatment Facility Connection Project

### ***Project Location***

City of Chowchilla

The unincorporated Community of Fairmead in Madera County.

### ***Project Description***

The proposed project would abandon the septic tanks and leach fields in Fairmead and direct wastewater flows through a new sewer trunk line to the City of Chowchilla's Wastewater Treatment Facility (WWTF) (Project). Approximately 175 residential connections, the Fairmead Elementary School, and a commercial property will be connected to the City of Chowchilla's WWTF. The proposed Project includes a collection system, pump station, force main and gravity main with wastewater treatment and disposal at the existing City of Chowchilla WWTF.

The document and documents referenced in the Initial Study/Mitigated Negative Declaration are available for review at the Chowchilla Civic Center located at 130 S. 2<sup>nd</sup> Street, and at the Chowchilla Library located at 300 W Kings Avenue.

As mandated by the California Environmental Quality Act (CEQA), the public review period for this document was 30 days (CEQA Section 15073[b]). The public review period began on January 30<sup>th</sup> and ended on March 9<sup>th</sup>. For further information, please contact Jason Rogers at 559-665-8615.

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## ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
ac	Acre
ADWF	Average Daily Wastewater Flow
afy	Acre-Foot per
APN	Assessor's Parcel Number
AQAP	Air Quality Attainment Plan
ATCM	Airborne Toxic Control Measure
BAU	Business-As-Usual
BMPs	Best Management Practices
CAA	Clean Air Act
CalGEM	California Geologic Energy Management
CARB	California Air Resources Board
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CH <sub>4</sub>	Methane
CNDDDB	California Natural Diversity Database
CO <sub>2</sub>	Carbon dioxide
CRECs	Controlled Recognized Environmental Concerns
CWA	Clean Water Act

dB	Decibels
DNL	Day-Night Average Level
DOC	Department of Conservation
DTSC	Department of Toxic Substance Control
EIR	Environmental Impact Report
EOADP	Extreme Ozone Attainment Demonstration Plan
EPA	U.S. Environmental Protection Agency
ESA	Environmental Site Assessment
ESAs	Environmentally Sensitive Areas
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FMMP	Farmland Mapping and Monitoring Program
g	Acceleration of Gravity
GAMAQI	Guide to Assessing and Mitigating Air Quality Impacts
GHGs	Greenhouse Gases
HAPs	Hazardous Air Pollutants
HCFCs	Halogenated Fluorocarbons
HCP	Habitat Conservation Plan
HFCs	Hydrofluorocarbons
HREC	Historical Recognized Environmental Concerns
HVAC	Heating, Ventilation, and Air Conditioning
IS	Initial Study
IS/MND	Initial Study/Mitigated Negative Declaration
ITE	Institute of Transportation Engineers



LOS	Level of Service
MBTA	Migratory Bird Treaty Act
MDB&M	Mount Diablo Base and Meridian
MGD	Million Gallons per Day
MM	Mitigation Measure
MND	Mitigated Negative Declaration
MTCO <sub>2</sub> e	Metric Tons Carbon Dioxide Equivalent
N <sub>2</sub> O	Nitrous Oxide
NAHC	Native American Heritage Commission
NO <sub>x</sub>	Oxide of Nitrogen
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NSR	New Source Review
O <sub>3</sub>	Ozone
OCPs	Organochlorine Pesticides
PEA	Preliminary Environmental Assessment
PFCs	Perfluorinated Carbons
PM <sub>2.5</sub>	Particulate Matter Less than 2.5 Microns
PM <sub>10</sub>	Particulate Matter Less than 10 Microns
PRC	Public Resources Code
ROG	Reactive Organic Gases
RSLs	Residential Screening Levels
RTIF	Regional Traffic Impact Fee
RWQCB	Regional Water Quality Control Board

SEI	Soils Engineering, Inc.
SF6	Sulfur Hexafluoride
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SPAL	Small Project Analysis Level
SWP	State Water Project
SWPPP	Stormwater Pollution Prevention Plan
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UWMP	Urban Water Management Plan
VMT	Vehicle Miles Traveled
WSA	Water Supply Assessment
OCPs	Organochlorine Pesticides

## **MITIGATED NEGATIVE DECLARATION**

As Lead Agency under the California Environmental Quality Act (CEQA), the City of Chowchilla reviewed the Project described below to determine whether it could have a significant effect on the environment because of its development. In accordance with CEQA Guidelines Section 15382, “[s]ignificant effect on the environment” means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance.

### ***Project Name***

Fairmead – Chowchilla Wastewater Treatment Facility Connection Project

### ***Project Location***

City of Chowchilla

The unincorporated Community of Fairmead in Madera County

### ***Project Description***

Fairmead is provided domestic water and light services by Madera County’s Maintenance District 33. However, properties within Fairmead rely on individual septic systems for sewer service. Wastewater in the Community is disposed of through the use of onsite septic tanks and leach fields or pits. There is no sanitary sewer collection system or wastewater treatment facility in the Community, or immediately adjacent to it. Potential for contamination of groundwater supplies has caused the State and County to request that the City of Chowchilla consider connecting Fairmead to the City’s existing wastewater treatment facility. This would require construction of a sewer collection system and transmission line from Fairmead to Chowchilla.

The proposed 12.6-acre project would abandon the septic tanks and leach fields in Fairmead and direct wastewater flows through a new sewer trunk line to the City of Chowchilla’s Wastewater Treatment Facility (WWTF) (Project). Approximately 175 residential connections, the Fairmead Elementary School, and a commercial property will be connected to the City of Chowchilla’s WWTF. The proposed Project includes a collection system, pump station, force main and gravity main with wastewater treatment and disposal at the existing City of Chowchilla WWTF.

***Mailing Address and Phone Number of Contact Person***

Jason Rogers  
Director of Public Works  
City of Chowchilla  
130 S. 2nd Street  
Chowchilla, CA 93610  
559-665-8615

***Findings***

As Lead Agency, the City of Chowchilla finds that the Project will not have a significant effect on the environment. The Environmental Checklist (CEQA Guidelines Appendix G) or Initial Study (IS) (see *Section 3 - Environmental Checklist*) identified one or more potentially significant effects on the environment, but revisions to the Project have been made before the release of this Mitigated Negative Declaration (MND) or mitigation measures would be implemented that reduce all potentially significant impacts less-than-significant levels. The Lead Agency further finds that there is no substantial evidence that this Project would have a significant effect on the environment.

***Mitigation Measures Included in the Project to Avoid Potentially Significant Effects***

**MM BIO-1:** Within 14 days of the start of Project activities, a pre-activity survey for spiny-sepaled button celery, western spadefoot, western pond turtle, western burrowing owl, northern harrier, hoary bat, Yuma myotis, San Joaquin kit fox, and American badger shall be conducted by a qualified biologist knowledgeable in the identification of these species. The pre-activity survey should include survey of: (1) Aquatic resources and grassy areas with moist conditions including the wetlands, vernal pools, artificial basins, and road ditches to determine presence of spiny-sepaled button celery, (2) Aquatic resources within the BSA including Berenda Slough, canals and ditches, emergent wetlands, vernal pools, artificial basins, road ditches, and puddles to determine presence of western spadefoot; (3) Berenda Slough to determine presence of western pond turtle, (4) Annual grassland habitat, gores along SR 99, and berms along the canals/ditches to identify presence of burrowing owls and their burrows, (5) Annual grassland and dryland grain crops to identify presence of northern harries, (6) Annual grassland and the riparian habitat along Berenda Slough to determine presence of American badgers and their dens, (7) Annual grassland to determine presence of San Joaquin kit foxes and their dens, and (8) Eucalyptus, cottonwood, and oak trees along Berenda Slough as well as the Road 16 bridge to determine presence of roosting bats. The transects shall be spaced at no greater than 30-foot intervals in order to obtain a 100 percent coverage of the Project site and a 250-foot buffer. Areas devoid of habitat incapable of supporting these species will not require surveys. If no evidence of these special-status species is detected, no further action is required.

**MM BIO-2:** If spiny-sepaled button celery is documented during the pre-activity survey within the area of Project disturbance, the species occurrences shall be mapped using

Geographic Information Systems (GIS) and shall be avoided to the most possible extent. If the spiny-sepaled button celery cannot be avoided and needs to be removed, the designated biologists shall assure that self-sustaining population of this species remains in place.

**MM BIO-3:** Because there is potential for vernal pool fairy shrimp to occur within wetland W1 along Fairmead Boulevard, this wetland shall be avoided during construction of the proposed alignment to assure no impact to these species will occur. If avoidance is not feasible, protocol level survey following the *Survey Guidelines for the Listed Large Branchiopods* (USFWS 2015) shall be conducted during the wet season to determine presence/absence of this species. If vernal pool fairy shrimp are identified or it is assumed that vernal pool fairy shrimp are present, a Biological Opinion from the USFWS shall be required. Impacts to vernal pool fairy shrimp will be mitigated with habitat replacement at a three to one ratio with an approved mitigation bank.

**MM BIO-4:** Because western spadefoot was identified during the reconnaissance survey within the BSA, Environmentally Sensitive Area (ESA) fencing capable of precluding western spadefoots from entering construction areas will be installed anywhere where western spadefoots would be identified during the pre-construction survey or during the duration of the Project. Fencing shall consist of 16-inch metal flashing or an equivalent material and shall be buried six inches below the ground surface, extending at least eight inches above the ground. If a western spadefoot is encountered during construction, the toad will be encouraged to leave the premises. If the toad does not leave on its own, it will be relocated to the wetland (W1) that was observed in the BAR.

**MM BIO-5:** If during the construction period the Berenda Slough is inundated, weekly examinations of slough shall occur to determine presence of western pond turtles. If western pond turtles are found in Berenda Slough, barrier fencing will be installed between the stream and upland habitat to prevent entrance into work areas along the banks of the slough. Fencing will consist of 16-inch metal flashing or an equivalent material and will be buried six inches below the ground surface, extending at least 8 inches above the ground. If western pond turtles are found in upland habitat within the work area, a 100-foot buffer will be set up around nearby construction zones to prohibit turtles from entering work areas, and turtles will be relocated to similar habitat in which they are found or in other suitable habitat (e.g., downstream) outside the 100-foot buffer.

**MM BIO-6:** If Project activities must occur during the nesting season (February 15 to August 31), pre-activity surveys will be conducted for Swainson's hawk nests in accordance with the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (CDFW 2020). The surveys will be conducted on and within 0.5-mile buffer of the Project. To meet the minimum level of protection for the species, surveys shall be conducted during at least two survey periods.

**MM BIO-7:** If an active Swainson's hawk nest is discovered at any time within 0.5 miles of active construction, a qualified biologist shall complete an assessment of the potential for current construction activities to impact the nest. The assessment will consider the type of construction activities, the location of construction relative to the nest, the visibility of



construction activities from the nest location, and other existing disturbances in the area that are not related to construction activities of this Project. Based on this assessment, the biologist will determine if construction activities can proceed and the level of nest monitoring required. Construction activities shall not occur within 500 feet of an active nest but depending upon conditions at the site this distance may be reduced. Full-time monitoring to evaluate the effects of construction activities on nesting Swainson's hawks may be required. The qualified biologist shall have the authority to stop work if it is determined that Project construction is disturbing the nest. These buffers may need to increase depending on the sensitivity of the nesting Swainson's hawk to disturbances and at the discretion of the qualified biologist. Construction that requires coming within 500 feet of an active nest must obtain an Incidental Take Permit (ITP) from the California Department of Fish and Wildlife.

**MM BIO-8:** The following avoidance and minimization measures will be implemented during all phases of the Project to reduce the potential for impact from the Project. They are modified from the *U.S. Fish and Wildlife Service Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance* (USFWS, 2011).

- Project-related vehicles shall observe a daytime speed limit of 20-mph throughout the site in all Project areas, except on County roads and State and federal highways.
- All Project activities shall occur during daylight hours, but if work must be conducted at night then a night-time construction speed limit of 10-mph shall be established.
- Off-road traffic outside of designated Project areas shall be prohibited.
- To prevent inadvertent entrapment of kit foxes or other animals during construction of the Project, all excavated, steep-walled holes or trenches more than two feet deep shall 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 shall be installed.
- Before holes or trenches are filled, they shall be thoroughly inspected for trapped animals. If at any time a trapped or injured kit fox is discovered, the USFWS and the CDFW will be contacted before proceeding with the work.
- In the case of trapped animals, escape ramps or structures shall be installed immediately to allow the animal(s) to escape, or the USFWS and CDFW should be contacted for guidance.
- All construction pipes, culverts, or similar structures with a diameter of four inches or greater that are stored at a construction site for one or more overnight periods shall be thoroughly inspected for kit foxes and burrowing owls 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 shall 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.
- All food-related trash items such as wrappers, cans, bottles, and food scraps shall be disposed of in securely closed containers and removed at least once a week from a construction or Project site.

- No pets, such as dogs or cats, shall be permitted on the Project site.
- Project-related use of rodenticides and herbicides shall be restricted.
- A representative shall be appointed by the Project proponent who will be the contact source for any employee or contractor who might inadvertently kill or injure a kit fox or who finds a dead, injured or entrapped kit fox. The representative shall be identified during the employee education program and their name and telephone number shall be provided to the USFWS and CDFW.
- Upon completion of the Project, all areas subject to temporary ground disturbances (including storage and staging areas, temporary roads, pipeline corridors, etc.) shall be recontoured if necessary, and revegetated to promote restoration of the area to pre-Project conditions. An area subject to "temporary" disturbance means any area that is disturbed during the Project, but after Project completion will not be subject to further disturbance and has the potential to be revegetated.
- Any Project personnel who are responsible for inadvertently killing or injuring one of these species shall immediately report the incident to their representative. This representative shall contact the CDFW (and USFWS in the case of San Joaquin kit fox) immediately in the case of a dead, injured or entrapped San Joaquin kit fox, American badger, or western burrowing owl.
- The Sacramento Fish and Wildlife office and CDFW Region 4 office shall be notified in writing within three working days of the accidental death or injury to a San Joaquin kit fox during Project related activities. The CDFW shall be notified in the case of accidental death to an American badger or western burrowing owl. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal and any other pertinent information.
- New sightings of San Joaquin kit fox, American badger, or western burrowing owl shall be reported to the CNDDDB. A copy of the reporting form and a topographic map clearly marked with the location of where a San Joaquin kit fox was observed should also be provided to the USFWS.

**MM BIO-9:** If Project activities must occur during the nesting season (February 1 to September 15), pre-activity nesting bird surveys shall be conducted within seven days prior to the start of construction at the construction site plus a 250-foot buffer for songbirds and a 500-foot buffer for raptors (other than Swainson's hawk). If no active nests are found, no further action is required. However, existing nests may become active and new nests may be built at any time prior to and throughout the nesting season, including when construction activities are in progress. If active nests are found during the survey or at any time during construction of the Project, an avoidance buffer ranging from 50 feet to 500 feet may be required, with the avoidance buffer from any specific nest being determined by a qualified biologist. The avoidance buffer shall remain in place until the biologist has determined that the young are no longer reliant on the adults or the nest. Work may occur within the avoidance buffer under the approval and guidance of the biologist, but full-time monitoring may be required. The biologist shall have the ability to stop construction if nesting adults show any sign of distress.

**MM BIO-10:** If sign of day roosting bats is identified within the BSA during the pre-activity survey, a follow up flyout inspection of the potential roost shall be conducted at dusk. If roosting bats are found to be present, then acoustical sampling will be conducted to determine species. If any special-status species bats or maternity colony of bats are identified, appropriate mitigation measures to avoid impact and disturbance to these species will be developed. If any other bats are identified roosting during the maternity season (May through August), measures to avoid impact and disturbance to these bats will be developed.

**MM BIO-11:** During construction, all efforts shall be made to avoid riparian habitat. The best method of confronting the Berenda Slough's riparian habitat would be to attach the pipeline to the bridge that crosses the slough. Prior to construction, an aquatic resource delineation shall be completed to determine the amount of riparian habitat within the Project site that may be impacted by proposed activities. In the event that riparian habitat is identified as being impacted, consultation with the CDFW shall be conducted to determine permitting needs and, if required, impacts to trees and vegetation in riparian habitat shall be replaced at a ratio of up to three to one.

**MM BIO-12:** Prior to construction, a wetland delineation shall be completed to determine the amount of wetlands within the Project site that may be impacted by the proposed Project using standard wetland delineation measures required by the USACE. In the event that wetland resources, permits from the USACE, RWQCB, and CDFW for impacts to wetland resources may need to be acquired. It is assumed that the Project will be granted a nationwide permit from the USACE. Under the nationwide permit, impacts to aquatic and wetland resources greater than 1/10<sup>th</sup> of an acre shall be compensated by in-kind compensatory credits at an approved mitigation bank or by utilizing an in-lieu fee program.

**MM CUL-1:** At a minimum, a Worker Environmental Awareness Training shall take place with those responsible for work prior to earthwork.

**MM CUL-2:** An archeological monitor shall be present during initial subsurface work on Maple Street, Sinclair Street, Elm Street, and Avenue 22 ½, Avenue 23 ¾, and Yates Avenue.

**MM CUL-3:** If prehistoric or historic-era cultural materials are encountered during construction activities, all work in the immediate vicinity of the find shall halt until a qualified archaeologist can evaluate the find and make recommendations. Cultural resource materials may include prehistoric resources such as flaked and ground stone tools and debris, shell, bone, ceramics, and fire-affected rock as well as historic resources such as glass, metal, wood, brick, or structural remnants. If the qualified archaeologist determines that the discovery represents a potentially significant cultural resource, additional investigations may be required to mitigate adverse impacts from Project implementation. These additional studies may include avoidance, testing, and evaluation or data recovery excavation. Implementation of the mitigation measure below would ensure that the proposed Project would not cause a substantial adverse change in the significance of a historical resource. Therefore, the Project would have a less-than-significant impact with incorporation of mitigation measures.

**MM CUL-4:** If human remains are discovered during construction or operational activities, Section 7050.5 of the California Health and Safety Code applies, and the following procedures shall be followed: There shall be no further excavation or disturbance of the area where the human remains were found until the County Coroner/Sheriff's Office is contacted. Duly authorized representatives of the Coroner shall be permitted onto the Project site and shall take all actions consistent with Health and Safety Code Section 7050.5 and Government Code Section 27460, et seq. Excavation or disturbance of the area where the human remains were found or within 50 feet of the find shall not be permitted to recommence until the Coroner determines that the remains are not subject to the provisions of law concerning investigation of the circumstances, manner, and cause of any death. If the Coroner determines the remains are Native American, the Coroner shall contact the NAHC within 24 hours, and the NAHC shall identify the person or persons it believes to be the "most likely descendant" (MLD) of the deceased Native American. The MLD may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in PRC Section 5097.98.

**MM GEO-1:** Prior to the start of earthwork, a qualified Project Paleontologist shall be retained to oversee the paleontological mitigation program and should attend the pre-construction meeting to consult with Project contractors concerning excavation schedules, paleontological field techniques, and safety issues.

**MM GEO-2:** A paleontological monitor shall be onsite during all excavations along the Project alignment that will directly impact the Modesto Formation, Riverbank Formation, and Turlock Lake Formation, with the exception of horizontal drilling for jack and bore installation. The paleontological monitor should be equipped to salvage fossils as they are unearthed (including bulk matrix samples containing microvertebrate fossils) to avoid construction delays. Paleontological monitoring may be reduced (e.g., part-time monitoring or spot-checking) or eliminated, at the discretion of the Project Paleontologist and in consultation with appropriate agencies (e.g., Project proponent, City of Chowchilla representatives). Changes to the paleontological monitoring schedule shall be based on the results of mitigation program as it unfolds during site development, and current and anticipated conditions in the field.

**MM GEO-3:** If fossils are discovered, the Project Paleontologist (or paleontological monitor) should make an initial evaluation to determine their significance. All identifiable vertebrate fossils (large or small) and uncommon invertebrate, plant, and trace fossils are considered to be significant and should be recovered. Representative samples of common invertebrate, plant, and trace fossils should also be recovered, all effort should be made to complete the recovery in a timely manner. It is important to keep in mind that some fossil specimens (e.g., a large mammal skeleton) may require an extended salvage period. Because of the potential for the recovery of a small fossil remains (e.g., isolated teeth of small vertebrates), it may be necessary to collect bulk-matrix samples for screen washing or to set up an onsite screen washing station.

**MM GEO-4:** In the event that fossils are discovered during a period when a paleontological monitor is not on site (i.e., inadvertent discovery), earthwork within the vicinity of the discovery site shall temporarily halt, and the Project Paleontologist contacted to evaluate the significance of the discovery. If the inadvertent discovery is determined to be significant, the fossils shall be recovered, as outlined in MM GEO-3.

**MM GEO-5:** Fossil remains collected during monitoring and salvage should be cleaned, repaired, sorted, taxonomically identified, and cataloged as part of the mitigation program. Fossil preparation may also include screen-washing of bulk matrix samples for microfossils or other laboratory analyses (e.g., radiometric carbon dating,) if applicable. Fossil preparation and curation activities may be conducted at the laboratory of the contracted Project Paleontologist, at an appropriate outside agency, and/or at the designated repository, and shall follow the standards of the designated repository.

**MM GEO-6:** Prepared fossils, along with copies of all pertinent field notes, photos, and maps, should be housed in an established, accredited museum repository with permanent, retrievable paleontological storage (e.g., University of California Museum of Paleontology, San Diego Natural History Museum). These procedures are essential steps in effective paleontological mitigation and CEQA compliance. The Project Paleontologist must have a writer repository agreement in hand prior to the initiation of mitigation activities. Mitigation of adverse impacts to significant paleontological resources is not complete until such curation into an established, accredited museum repository has been fully completed and documented.

**MM GEO-7:** A final summary report should be completed that outlines the results of the mitigation program. The report and inventory, when submitted to the appropriate Lead Agency, along with confirmation of the curation of recovered specimens into an established, accredited museum repository, will signify completion of the program to minimize impacts to paleontological resources. A copy of the paleontological monitoring report should be submitted to the Lead Agency and to the designated museum repository.

**MM HAZ-1:** Avoid/Minimize Potential Impacts from Construction Material Release. Prior to construction, the contractor shall develop a Spill Prevention and Contingency Plan for the proposed Project that at a minimum includes the following:

- Containment and cleanup equipment (e.g., absorbent pads, mats, socks, granules, drip pans, shovels, and lined clean drums) shall be at the staging areas and construction site for use, as needed.
- Staging areas where refueling, storage, and maintenance of equipment occur shall not be located within 100 feet of drainages to reduce the potential for contamination by spills.
- Construction equipment shall be maintained and kept in good operating condition to reduce the likelihood of line breaks or leakage.
- No refueling or servicing shall be done without absorbent material (e.g., absorbent pads, mats, socks, pillows, and granules) or drip pans underneath to contain spilled



material. If these activities result in an accumulation of materials on the soil, the soil shall be removed and properly disposed of as hazardous waste.

- If a spill is detected, construction activity shall cease immediately, and the procedures described in the Spill Prevention and Contingency Plan will be immediately enacted to safely contain and remove spilled materials.
- Spill areas shall be restored to pre-spill conditions, as practicable.
- Spills shall be documented and reported to Madera County and appropriate resource agency personnel.

**MM HAZ-2:** An encroachment permit, approved by the County Department of Public Works, will be required to cut trenches in the County's right of way. As a part of the encroachment permit, a traffic control plan will be submitted to the County Public Works Department.

**MM HYD-1:** Implement Sedimentation and Erosion Control Measures, which includes drainage control and the installation and implementation of Best Management Practices (BMPs), including straw bales, coir rolls, hydro seeding, etc., in areas of bare soil, and in drainages near all areas of disturbance during construction of the proposed Project and would therefore reduce potential impacts to less than significant. BMPs for control of erosion are required as part of Madera County's grading and building permits to reduce erosion of soils on the proposed Project site. The requirements of the State General Construction Stormwater Permit will require a Stormwater Pollution Prevention Program (SWPPP) because area of impact would be greater than one acre. With the incorporation of Mitigation Measure HYD-1, potential erosion and sedimentation impacts are considered less than significant.

**MM NSE-1:** Madera County shall incorporate the following BMPs to minimize noise impacts during construction activities:

- Construction shall be limited to daytime hours between 7:00 a.m. and 7:00 p.m. Monday through Friday and 9:00 a.m. and 5:00 p.m. on Saturdays.
- All construction equipment shall be equipped with sound-control devices no less effective than those provided on the original equipment. Equipment shall have a muffled exhaust.
- Appropriate additional noise-reducing measures will be implemented, including but not limited to:
  - Changing the location of stationary construction equipment when practical; and
  - Shutting off idling equipment.
- If construction activities are required outside of the daytime working hours described above, Madera County shall notify residents 48 hours in advance. If after-hour construction is required due to an emergency, Madera County will notify nearby residents immediately.

## SECTION 1 - INTRODUCTION

### ***1.1 - Overview***

The City of Chowchilla is proposing to connect the Community of Fairmead into their wastewater treatment facility.

### ***1.2 - California Environmental Quality Act***

The City of Chowchilla is the Lead Agency for this Project pursuant to the CEQA Guidelines (Public Resources Code Section 15000 et seq.). The Environmental Checklist (CEQA Guidelines Appendix G) or Initial Study (IS) (see *Section 3 – Initial Study*) provides analysis that examines the potential environmental effects of the construction and operation of the Project. Section 15063 of the CEQA Guidelines requires the Lead Agency to prepare an IS to determine whether a discretionary project will have a significant effect on the environment. A Mitigated Negative Declaration (MND) is appropriate when an IS has been prepared and a determination can be made that no significant environmental effects will occur because revisions to the Project have been made or mitigation measures will be implemented that reduce all potentially significant impacts to less-than-significant levels. The content of an MND is the same as a Negative Declaration, with the addition of identified mitigation measures and a Mitigation Monitoring and Reporting Program (MMRP) (see *Appendix A – Mitigation Monitoring and Reporting Program*).

Based on the IS, the Lead Agency has determined that the environmental review for the proposed application can be completed with an MND.

### ***1.3 - Impact Terminology***

The following terminology is used to describe the level of significance of impacts.

- A finding of “no impact” is appropriate if the analysis concludes that the Project would not affect a topic area in any way.
- An impact is considered “less than significant” if the analysis concludes that it would cause no substantial adverse change to the environment and requires no mitigation.
- An impact is considered “less than significant with mitigation incorporated” if the analysis concludes that it would cause no substantial adverse change to the environment with the inclusion of environmental commitments that have been agreed to by the applicant.
- An impact is considered “potentially significant” if the analysis concludes that it could have a substantial adverse effect on the environment.

## ***1.4 - Document Organization and Contents***

The content and format of this IS/MND is designed to meet the requirements of CEQA. The report contains the following sections:

- *Section 1 – Introduction:* This section provides an overview of CEQA requirements, intended uses of the IS/MND, document organization, and a list of regulations that have been incorporated by reference.
- *Section 2– Project Description:* This section describes the Project and provides data on the site's location.
- *Section 3 – Environmental Checklist:* This section contains the evaluation of 21 different environmental resource factors contained in Appendix G of the CEQA Guidelines. Each environmental resource factor is analyzed to determine whether the proposed Project would have an impact. One of four findings is made which include: no impact, less-than-significant impact, less than significant with mitigation, or significant and unavoidable. If the evaluation results in a finding of significant and unavoidable for any of the 21 environmental resource factors, then an Environmental Impact Report will be required.
- *Section 4 – List of Preparers:* This section identifies the individuals who prepared the IS/MND.
- *Section 5 – Bibliography:* This section contains a full list of references that were used in the preparation of this IS/MND.
- *Appendix A – Mitigation and Monitoring Program*
- *Appendix B – Project Report*
- *Appendix C – Air Quality & Greenhouse Gas Impact Assessment*
- *Appendix D – Biological Analysis Report*
- *Appendix E – Cultural Report*
- *Appendix F – Paleontological Resources Technical Report*
- *Appendix G – Traffic Memorandum*

## ***1.5 - Incorporated by Reference***

The following documents and/or regulations are incorporated into this IS/MND by reference:

- 1995 Madera County General Plan and EIR
- 2011 City of Chowchilla General Plan and EIR
- 2012 (Unadopted) Fairmead Colony Area Plan

## **SECTION 2 - PROJECT DESCRIPTION**

### ***2.1 - Introduction***

The City of Chowchilla is proposing to connect the Community of Fairmead into their wastewater treatment facility.

### ***2.2 - Project Location***

Fairmead is a small, rural community located on the east side of State Route (SR) 99 just south of SR 152 in unincorporated Madera County. Located roughly in the center of the San Joaquin Valley, Fairmead lies between the cities of Chowchilla to the north and Madera to the south. The Community includes a small core of compact streets and blocks located east of SR 99 and the Union Pacific (formerly Southern Pacific) railroad along Fairmead Boulevard.

The City of Chowchilla's Wastewater Treatment Facility, 15750 Avenue 24 ½ in Chowchilla, CA, is located at the northern most end of the proposed Project. Figure 2-1 is a map of the regional location of the Project. Figure 2-2 shows the Project site plan.

### ***2.3 - Surrounding Land Uses***

The Project area land uses within Fairmead are predominantly residential and surrounded by agricultural land uses as it approaches Chowchilla. Fairmead is located along State Highway 99 and the Union Pacific (formerly Southern Pacific) railroad.

### ***2.4 - Proposed Project***

The City of Chowchilla proposes to extend service from the municipal wastewater treatment facility to the unincorporated Community of Fairmead.

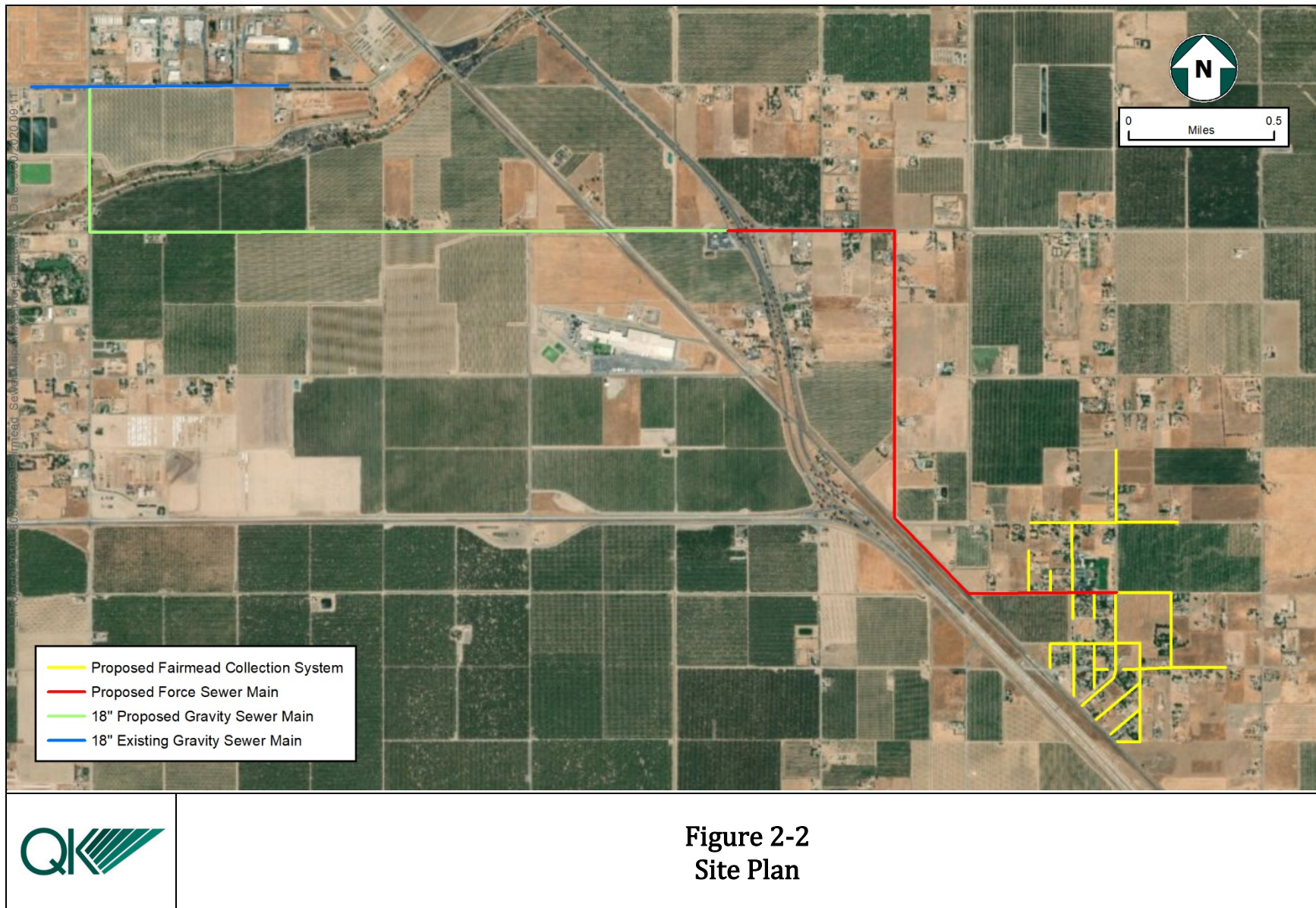
Fairmead is provided domestic water and light services by Madera County's Maintenance District 33. However, properties within Fairmead rely on individual septic systems for sewer service. Wastewater in the Community is disposed of through the use of onsite septic tanks and leach fields or pits. There is no sanitary sewer collection system or wastewater treatment facility in the Community, or immediately adjacent to it. Potential for contamination of groundwater supplies has caused the State and County to request that the City of Chowchilla consider connecting Fairmead to the City's existing wastewater treatment facility. This would require construction of a sewer collection system and transmission line from Fairmead to Chowchilla.

The proposed 12.6-acre project would abandon the septic tanks and leach fields in Fairmead and direct wastewater flows through a new sewer trunk line to the City of Chowchilla's Wastewater Treatment Facility (WWTF) (Project). Approximately 175 residential connections, the Fairmead Elementary School, and a commercial property will be connected to the City of Chowchilla's WWTF. The proposed Project includes a collection system, pump station, force main and gravity main with wastewater treatment and disposal at the existing City of Chowchilla WWTF. The Project will include the following components. The Final

Report (Appendix B) provides a discussion for all components of the Project, including evaluations of the WWTP, the sanitary sewer collection system, existing conditions, project phasing, and proposed project improvements.







### **2.4.1 - FAIRMEAD GRAVITY COLLECTION SYSTEM AND LIFT STATION**

The proposed Project would abandon the existing septic tanks and leach fields in Fairmead and direct wastewater flows into a new sewer collection system within Fairmead. Approximately 175 residential connections, the Fairmead Elementary School, and a commercial property will be serviced by this new collection system.

The new sewer collection system will drain to a centrally located pump lift station in four inches to 10 inches diameter sewer pipes, with 4-foot or 5-foot-diameter manholes spaced at least every 500 feet. Gravity sewer trenches will be 1.5 feet to 3 feet wide and vary from 3 feet to 20 feet deep.

The sewer lift station will be centrally located in Fairmead, 20 feet to 25 feet deep, with appurtenances to include a standby generator, an earthen emergency basin, an odor control scrubber, and a small building to house electrical panels, all on a one-acre site.

### **2.4.2 - FORCE MAIN AND GRAVITY SEWER LINE**

The proposed lift station will discharge effluent to a force main that will consist of one to two 4-inch to 8-inch-diameter pipes approximately 2.5 miles long from the Community of Fairmead to Avenue 24 on the west side of Highway 99, inside the City of Chowchilla.

The City's existing 18-inch gravity sewer main will be extended south along Road 16 and then east along Avenue 24 and will terminate on the west side of Highway 99 for a distance of 2.2 miles where it will connect to the new force main.

Both the force main and gravity main will be installed in the roadway and roadway shoulders. The precise footprint of the pipe alignment has not been determined; however, it will be within the public right of way and can be expected to vary from side to side of the road to avoid existing utilities. The area of disturbance may be up to 20 feet either side of the road. During construction there will be an open cut trench, 3 feet to 5 feet wide, and from 3 feet to 20 feet deep. The alignment will encounter the Berenda Slough as well as three canals: the Berenda Canal (undergrounded), the Califa Canal (undergrounded), and the Califa Lateral A. The preferred method to cross the Berenda Slough would be to attach the pipeline to the bridge that passes over the slough as this would be the least invasive and cheapest option. However, subsequent environmental review may be required if proposed attachment to the bridge cannot be completed and instead must jack and bore the pipeline beneath the Berenda Slough. The jack and bore method will be applied to the canals mentioned above. Additionally, the Project requires tunneling beneath SR 99 and the Union Pacific Railroad. The total length of both the proposed gravity line and the proposed force main segment will be 4.7 miles. The main construction staging and materials storage area will be within the City's existing WWTF compound. Temporary materials storage and staging along the within Project area and will occur within the area already analyzed for impacts.

With the additional wastewater flow from Fairmead being conveyed through the existing 18-inch gravity main, peak flows may cause a back-up where the existing and proposed lines



come together at the intersection of Avenue 24½ and Road 16. In an effort to lessen any potential flow disruption, a short length of 10-inch pipe at that connection will be replaced with 24-inch pipe with two manholes.

### ***2.4.3 - WASTEWATER TREATMENT FACILITY IMPROVEMENTS***

In order to satisfy the need for additional capacity to serve Fairmead, and the redundancy needed to serve both Chowchilla and Fairmead, a 0.9 MGD package treatment facility will be constructed within the existing treatment plant boundary. The addition of Fairmead would push the existing flows to over 0.9 MGD which is the current facility capacity with one of the treatment trains offline. Construction of a new 0.9 MGD package treatment facility would act as a third treatment train and bring the effective capacity closer to 1.8 MGD although not expected to operate at this level since one train will be cycled offline for maintenance during normal operations. The new package treatment facility offers redundancy during maintenance periods and its more current and efficient design would make it the primary treatment train.

The existing bar screen within the WWTF does not perform sufficiently as it allows passthrough of solids that causes blockages further along in the treatment train. The addition of Fairmead is likely to exacerbate the effectiveness of the existing system. The installation of an additional bar screen will lessen the burden on the existing structure and allow Public Works staff to take one offline for cleaning and maintenance, increasing solids removal earlier in the process and improving the quality of water passed to the next stage of treatment.

#### ***Construction***

Construction is anticipated to begin in April 2022 and would take approximately seven months and finish in November 2022. All pipeline segments and Project components are anticipated to be built out simultaneously. The required vehicles and equipment that are anticipated for these construction activities include:

- Forklifts
- Tractors/Loaders/Backhoes
- Concrete/Industrial Saws
- Excavators
- Plate Compactors
- Signal Boards
- Air Compressors
- Cement and Mortar Mixers
- Cranes
- Generator Sets
- Welders
- Pavers

## SECTION 3 - INITIAL STUDY

### ***3.1 - Environmental Checklist***

1. Project Title:

Fairmead – Chowchilla Wastewater Treatment Facility Connection Project

2. Lead Agency Name and Address:

City of Chowchilla  
130 S. 2nd Street  
Chowchilla, CA 93610

3. Contact Person and Phone Number:

Jason Rogers  
Director of Public Works  
559-665-8615

4. Project Location:

City of Chowchilla  
The unincorporated Community of Fairmead in Madera County

5. General Plan Designations:

Residential, Commercial, Open Space, Public Institutional, Agricultural. Zoning:  
Residential (RUS), Commercial (PCD, CUM), Open Space (POS, OS), Public Institutional (IA), Agricultural (ARE-40, AR-5, ARE-20).

6. Description of Project:

See Section 2.

7. Surrounding Land Uses and Setting:

The Project area land uses within Fairmead are predominantly residential and surrounded by agricultural land uses as it approaches Chowchilla. Fairmead is located along State Highway 99 and the Union Pacific (formerly Southern Pacific) railroad.

8. Other Public Agencies Whose Approval is Required:

- San Joaquin Valley Air Pollution Control District
- Central Valley Regional Water Quality Control Board
- California State Water Resources Control Board
- California Department of Fish and Wildlife

- Madera County Maintenance District 33
  - Madera County Local Agency Formation Commission
9. Have California Native American tribes traditionally and culturally affiliated with the Project area requested consultation pursuant to Public Resources Code Section 21080.3.1? If so, is there a plan for consultation that includes, for example, the determination of significance of impacts to tribal cultural resources, procedures regarding confidentiality, etc.?

A tribal consultation list request was sent to the Native American Heritage Commission (NAHC) on February 3, 2020. The City received a response from the NAHC on February 3, 2020 indicating that the Dumna Wo-Wah Tribe, North Valley Yokuts Tribe, Wuksache Indian Tribe, and the Southern Sierra Miwuk Nation are the applicable tribes in the area that have requested project consultation. Consultation letters were sent to these tribes on February 5, 2020 and follow-up letters were sent on March 2, 2020. The City received no response from the tribes.

### ***3.2 - Environmental Factors Potentially Affected***

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

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

### 3.3 - Determination

On the basis of this initial evaluation:

- ☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- ☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- ☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- ☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect (a) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (b) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENT IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- ☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature

Printed Name

Date

For

### ***3.4 - Evaluation of Environmental Impacts***

1. A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
2. All answers must take account of the whole action involved, including offsite as well as onsite, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
3. Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.
4. "Negative Declaration: Less Than Significant with Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less-Than-Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less-than-significant level (mitigation measures from "Earlier Analyses," as described in (5) below, may be cross-referenced).
5. Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:
  - a. Earlier Analysis Used. Identify and state where they are available for review.
  - b. Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
  - c. Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6. Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.
7. Supporting Information Sources: A source list should be attached, and other sources used, or individuals contacted should be cited in the discussion.
8. This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.
9. The explanation of each issue should identify:
  - a. the significance criteria or threshold, if any, used to evaluate each question; and
  - b. the mitigation measure identified, if any, to reduce the impact to less than significant.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than- Significant Impact	No Impact
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### 3.4.1 - AESTHETICS

Except as provided in Public Resources Code Section 21099, would the Project:

- |    |  |                          |                          |                                     |                          |
|----|--|--------------------------|--------------------------|-------------------------------------|--------------------------|
| a. | Have a substantial adverse effect on a scenic vista?   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b. | Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway?  | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| d. | Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?  | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Discussion

#### Impact #3.4.1a – Except as provided in Public Resources Code Section 21099, would the Project have a substantial adverse effect on a scenic vista?

The Project area encompasses the Community of Fairmead and extends to the Chowchilla WWTF, passing through areas designated for urban development and agricultural cultivation. The Project consists of replacing septic tanks with the connection to a wastewater system. Most of the installation would occur along road rights of way. Any obstructions that would occur along the roadways would be temporary and intermittent. The implementation of the Project would not block or preclude views to any area containing important or what would be considered significant viewsheds. Therefore, no scenic vistas will be impacted by the construction of the Project. Additionally, the Project does not lie near or within a State Designated or Eligible State Scenic Highway (California Department of Transportation, 2020). Further, the Project will not include the removal of trees determined to be scenic or of scenic value, the destruction of rock outcroppings or degradation of any historic building. Therefore, no resources will be affected by construction. The Project will

not result in development that will cause a substantial change to the current appearance of the environment.

**MITIGATION MEASURE(S)**

No mitigation is required.

**LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact*.

**Impact #3.4.1b - Except as provided in Public Resources Code Section 21099, would the Project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway?**

See impact #3.4.1a, above.

**MITIGATION MEASURE(S)**

No mitigation is required.

**LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact*.

**Impact #3.4.1c - Except as provided in Public Resources Code Section 21099, would the Project 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?**

The Project is in an area that is designated for urban development. Construction phase of the Project may result in minimal changes to the existing visual character of the area, but these impacts would be localized and temporary. The Project's operation would not change or degrade the visual character of the site. Therefore, it would not result in a substantial impact to the visual quality of the area.

**MITIGATION MEASURE(S)**

No mitigation is required.

**LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact*.



**Impact #3.4.1d - Except as provided in Public Resources Code Section 21099, would the Project create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?**

Construction of the proposed Project would generally occur during daytime hours, typically from 7:00 a.m. to 6:00 p.m. All lighting would be directed downward and shielded to focus illumination on the desired work areas only and prevent light spillage onto adjacent properties. Because lighting used to illuminate work areas would be shielded, focused downward, and turned off by 6:00 p.m., the potential for lighting to adversely affect any surrounding area is minimal. Increased truck traffic and the transport of construction materials to the Project site would temporarily increase glare conditions during construction. However, this increase in glare would be minimal. Construction activity would focus on specific areas on the sites, and any sources of glare would not be stationary for a prolonged period of time. Therefore, construction of the proposed Project would not create a new source of substantial glare that would affect daytime views in the area.

***MITIGATION MEASURE(S)***

No mitigation is required.

***LEVEL OF SIGNIFICANCE***

The Project would have a *less-than-significant impact*.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than- Significant Impact	No Impact
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### 3.4.2 - AGRICULTURE AND FORESTRY RESOURCES

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the State's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the Project:

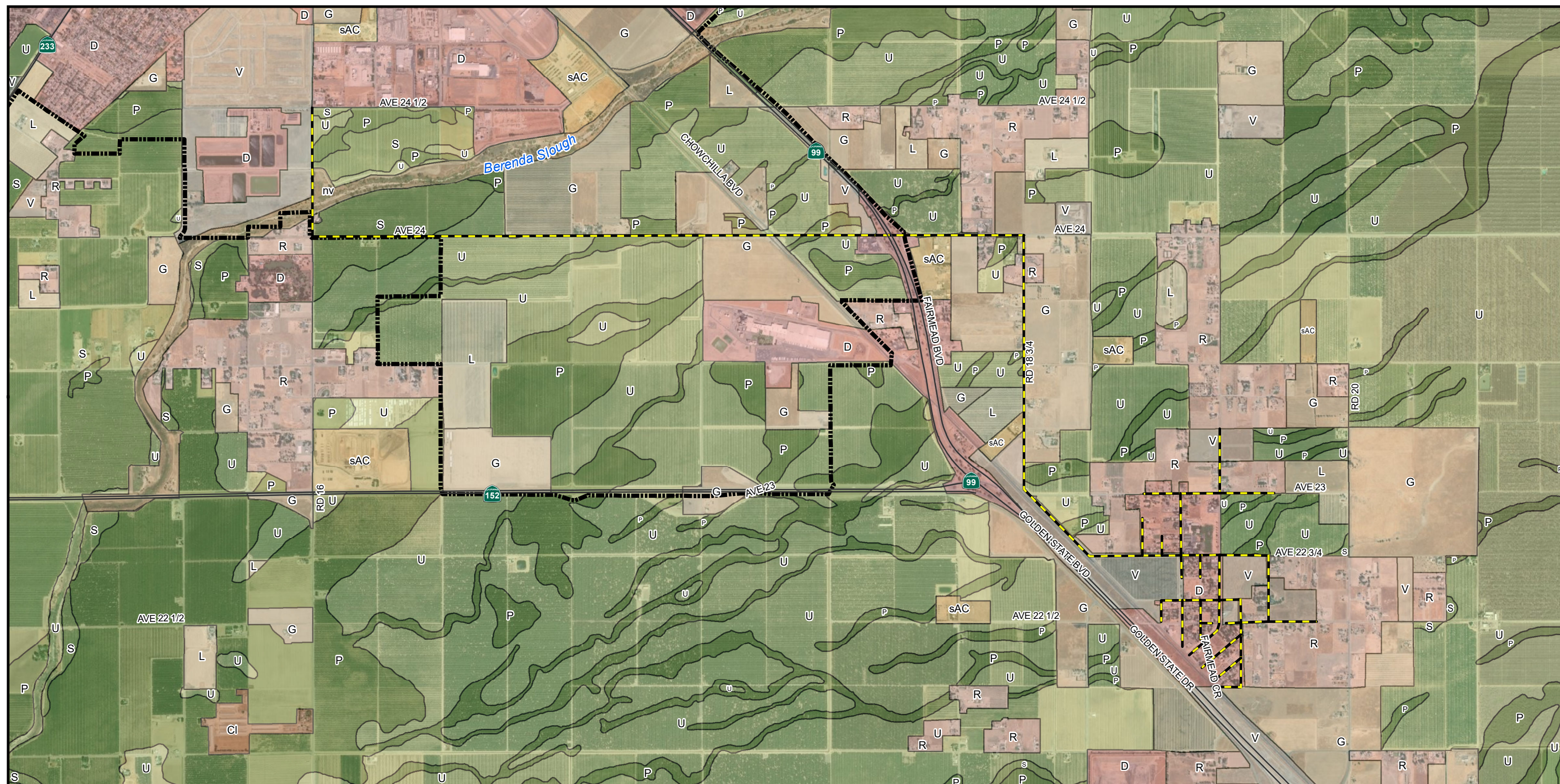
a.	Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b.	Conflict with existing zoning for agricultural use or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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))?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d.	Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e.	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to nonagricultural use or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

### Discussion

**Impact #3.4.2a – Would the Project 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 nonagricultural use?**

The proposed Project would not convert any Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland). As seen in Figure 3.4.2-1, based on the classification from the Farmland Mapping and Monitoring Program, the Project area is

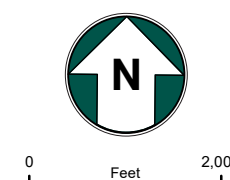




**Figure 3.4.2-1 Farmland Mapping and Monitoring Program 2016**



- |  |  |   |   |
|--|--|---|---|
| <span style="display: inline-block; width: 15px; height: 15px; background-color: #90EE90; border: 1px solid black;"></span> P - Prime Farmland                   | <span style="display: inline-block; width: 15px; height: 15px; background-color: #FFFFE0; border: 1px solid black;"></span> L - Farmland of Local Importance           | <span style="display: inline-block; width: 15px; height: 15px; background-color: #F0E68C; border: 1px solid black;"></span> R - Rural Residential Land                        | <span style="display: inline-block; width: 20px; height: 10px; border: 2px dashed black;"></span> Chowchilla City Limit<br><span style="display: inline-block; width: 20px; height: 10px; border: 2px solid yellow;"></span> Project Site |
| <span style="display: inline-block; width: 15px; height: 15px; background-color: #90EE90; border: 1px solid black;"></span> S - Farmland of Statewide Importance | <span style="display: inline-block; width: 15px; height: 15px; background-color: #D2B48C; border: 1px solid black;"></span> CI - Confined Animal Agriculture           | <span style="display: inline-block; width: 15px; height: 15px; background-color: #F0E68C; border: 1px solid black;"></span> sAC - Semi-agricultural and Rural Commercial Land |   |
| <span style="display: inline-block; width: 15px; height: 15px; background-color: #90EE90; border: 1px solid black;"></span> U - Unique Farmland                  | <span style="display: inline-block; width: 15px; height: 15px; background-color: #D2B48C; border: 1px solid black;"></span> nv - Nonagricultural or Natural Vegetation | <span style="display: inline-block; width: 15px; height: 15px; background-color: #F0E68C; border: 1px solid black;"></span> D - Urban and Built-Up Land                       |   |
| <span style="display: inline-block; width: 15px; height: 15px; background-color: #90EE90; border: 1px solid black;"></span> G - Grazing Land                     | <span style="display: inline-block; width: 15px; height: 15px; background-color: #D2B48C; border: 1px solid black;"></span> V - Vacant or Disturbed Land               |   |   |





classified as Urban Build Up, Rural Residential, Grazing Land, and Vacant/Disturbed Land (California Department of Conservation, 2016). There are no Williamson Act contracts in the Project area. Construction activities will not result in the conversion of existing agriculture or areas designated as Prime Farmland to nonagricultural uses. Therefore, there would be no impact to State-designated Farmland as a result of the proposed Project.

**MITIGATION MEASURE(S)**

No mitigation is required.

**LEVEL OF SIGNIFICANCE**

The Project would have *no impact*.

**Impact #3.4.2b – Would the Project conflict with existing zoning for agricultural use or a Williamson Act contract?**

See discussion of Impact #3.4.2a, above.

**MITIGATION MEASURE(S)**

No mitigation is required.

**LEVEL OF SIGNIFICANCE**

The Project would have *no impact*.

**Impact #3.4.2c – Would the Project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?**

The Public Resources Code Section 12220 (g) and Section 4526 defines “Forest land” as land that can support 10 percent native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits. There are no forest lands identified on the Project site or within its vicinity; therefore, there would be no conflict with or impacts to zoning for forest land or timber land. The Project would not result in the loss or conversion of forest land to a non-forest use.

**MITIGATION MEASURE(S)**

No mitigation is required.

***LEVEL OF SIGNIFICANCE***

The Project would have *no impact*

**Impact #3.4.2d – Would the Project result in the loss of forest land or conversion of forest land to non-forest use?**

See discussion of Impact #3.4.2c, above.

***MITIGATION MEASURE(S)***

No mitigation is required.

***LEVEL OF SIGNIFICANCE***

The Project would have *no impact*

**Impact #3.4.2e – Would the Project involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to nonagricultural use or conversion of forest land to non-forest use?**

See discussion of Impacts #3.4.2a and #3.4.2c, above.

***MITIGATION MEASURE(S)***

No mitigation is required.

***LEVEL OF SIGNIFICANCE***

The Project would have *no impact*

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than- Significant Impact	No Impact
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### 3.4.3 - AIR QUALITY

Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the Project:

a.	Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b.	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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c.	Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d.	Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

### Discussion

The following analysis is based primarily on an Air Quality Impact Analysis (VRPA Technologies, 2020) prepared in accordance with the San Joaquin Valley Air Pollution Control District's (SJVAPCDs) instructions which are included in the District's *Guide for Assessing and Mitigating Air Quality Impacts* (GAMAQI) (SJVAPCD 2015) for the Project. In addition to providing an assessment of the Project's impacts to air quality and GHGs, the AQIA includes a detailed description of the regulatory environment as it relates to air quality.

#### Impact #3.4.3a – Would the Project Conflict with or obstruct implementation of the applicable air quality plan?

The primary way of determining consistency with the air quality plan's (AQP's) assumptions is determining consistency with the applicable General Plan to ensure that the Project's population density and land use are consistent with the growth assumptions used in the AQPs for the air basin.

As required by California law, city and county General Plans contain a Land Use Element that details the types and quantities of land uses that the city or county estimates will be needed for future growth, and that designate locations for land uses to regulate growth. The Madera County Transportation Commission (MCTC) uses the growth projections and land use information in adopted general plans to estimate future average daily trips and then vehicle

miles traveled (VMT), which are then provided to SJVAPCD to estimate future emissions in the AQPs. Existing and future pollutant emissions computed in the AQP are based on land uses from area general plans. AQPs detail the control measures and emission reductions required for reaching attainment of the air standards.

The applicable General Plan for the project is the Madera County and City of Chowchilla General Plans, which were adopted in 1995 and 2011, respectively. The Project is consistent with the currently adopted General Plans and is therefore consistent with the population growth and VMT applied in the plan. Therefore, the Project is consistent with the growth assumptions used in the applicable AQPs. As a result, the Project will not conflict with or obstruct implementation of any air quality plans. Therefore, no mitigation is needed.

#### **MITIGATION MEASURE(S)**

No mitigation is required.

#### **LEVEL OF SIGNIFICANCE**

The Project would have *no impact*.

**Impact #3.4.3b – 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?**

The Madera County area is nonattainment for federal and State air quality standards for ozone, in attainment of federal standards and nonattainment for State standards for PM<sub>10</sub>, and nonattainment for federal and State standards for PM<sub>2.5</sub>. The San Joaquin Valley Air Pollution Control District (SJVAPCD) has prepared the 2016 and 2013 Ozone Plans, 2007 PM<sub>10</sub> Maintenance Plan, and 2012 PM<sub>2.5</sub> Plan to achieve federal and State standards for improved air quality in the SJVAB regarding ozone and PM. Inconsistency with any of the plans would be considered a cumulatively adverse air quality impact. As discussed in Impact 3.4.3a, the Project is consistent with the currently adopted General Plans and is therefore consistent with the population growth and VMT applied in the plan. Therefore, the Project is consistent with the growth assumptions used in the 2016 and 2013 Ozone Plan, 2007 PM<sub>10</sub> Maintenance Plan, and 2012 PM<sub>2.5</sub> Plan.

Project specific emissions that exceed the thresholds of significance for criteria pollutants would be expected to result in a cumulatively considerable net increase of any criteria pollutant for which the County is in nonattainment under applicable federal or State ambient air quality standards. It should be noted that a project is not characterized as cumulatively insignificant when project emissions fall below thresholds of significance. SJVAPCD thresholds of significance for determining environmental significance can be found in Table 3.4.3-1, below.

**Table 3.4.3-1  
Project Construct Emissions (tons/year)**

Summary Report	CO	NO <sub>x</sub>	ROG	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2e</sub>
Project Site Construction Emissions Per Year?	2.67	2.32	0.28	0.01	0.19	0.13	482.36
SJVAPCD Level of Significance	100	10	10	27	15	15	None
Does the Project Exceed the Standard?	No	No	No	No	No	No	No

Source: Road Construction Emissions Model

Emissions generated from construction of the Project will be less than the applicable SJVAPCD emission thresholds for criteria pollutants. Per CEQA Guidelines §15064(h)(3), a Lead Agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan or mitigation program, including, but not limited to an air quality attainment or maintenance plan that provides specific requirements that will avoid or substantially lessen the cumulative problem within the geographic area in which the project is located.

### ***Air Quality Plan***

As noted above, the SJVAPCD has prepared the 2016 and 2013 Ozone Plans, 2007 PM<sub>10</sub> Maintenance Plan, and 2012 PM<sub>2.5</sub> Plan to achieve federal and State standards for improved air quality in the SJVAB regarding ozone and PM. Existing and future pollutant emissions computed in the AQP are based on land uses from area general plans. The AQP details the control measures and emission reductions required for reaching attainment of the air standards.

The applicable General Plans for the Project are the Madera County and City of Chowchilla General Plans, which were adopted in 1995 and 2011, respectively. The Project is consistent with the currently adopted General Plans for the Fairmead Community and is therefore consistent with the population growth and VMT applied in the plan. Therefore, the Project is consistent with the growth assumptions used in the applicable AQP. As a result, the Project will not conflict with or obstruct implementation of any air quality plans.

### ***Ozone/Particulate Matter***

As discussed above, Project emissions would not exceed the project-level significance thresholds for ozone precursors ROG and NO<sub>x</sub> or PM<sub>10</sub> and PM<sub>2.5</sub> during construction and



operation. The SJVAPCD considers projects that exceed the project-level thresholds of significance as cumulatively significant. The Project's emissions would not combine with other sources in the SJVAB to make a cumulatively considerable contribution to a violation of the ozone standards. Therefore, this impact is less than significant. As such, there would not be a significant contribution to health effects from ozone and particulate matter.

Based on the assessment above, the Project will not 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 (including releasing emissions which exceed quantitative thresholds for ozone precursors) and any impacts would be less than significant.

**MITIGATION MEASURE(S)**

No mitigation is required.

**LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact*.

**Impact #3.4.3c – Would the Project expose sensitive receptors to substantial pollutant concentrations?**

Sensitive receptors refer to those segments of the population 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 that have the greatest potential to attract these types of sensitive receptors include schools, parks, playgrounds, daycare centers, nursing homes, hospitals, and residential communities.

The first step in evaluating the potential for impacts to sensitive receptors for toxic air contaminants (TACs) from the Project is to perform a screening level analysis. For Type A Projects, one type of screening tool is found in the CARB Handbook: Air Quality and Land Use Handbook: A Community Perspective. This handbook includes a table (depicted in Table 4 of Appendix C) with recommended buffer distances associated with various types of common sources. Since, the Project does not correspond with the characteristics of the source categories included in Table 4, a health risk assessment is not needed at this time. Therefore, the Project will not expose sensitive receptors to substantial pollutant concentrations and any impacts would be less than significant.

**MITIGATION MEASURE(S)**

No mitigation is required.

**LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact*.

**Impact #3.4.3d – Would the Project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?**

The SJVAPCD requires that an analysis of potential odor impacts be conducted for the following two situations:

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

The intensity of an odor source's operations and its proximity to sensitive receptors influences the potential significance of odor emissions. The SJVAPCD has identified some common types of facilities that have been known to produce odors in the SJVAB. The types of facilities that are known to produce odors are shown in Table 5 of Appendix C along with a reasonable distance from the source within which, the degree of odors could possibly be significant. The Project corresponds with specific characteristics (projects) identified in Table 5. The Project seeks to abandon the septic tanks and leach fields in Fairmead and direct wastewater flows through a new sewer trunk line to the existing City of Chowchilla's WWTF. The Project does not consist of the siting of 'new' wastewater treatment facilities, but rather the improvement of Fairmead facility components. As a result, the Project will not result in other emissions adversely affecting a substantial number of people.

**MITIGATION MEASURE(S)**

No mitigation is required.

**LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact*

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than- Significant Impact	No Impact
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### 3.4.4 - BIOLOGICAL RESOURCES

Would the Project:

a.	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b.	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d.	Interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e.	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

### Discussion

A reconnaissance level biological survey was conducted to determine the presence or absence of sensitive biological resources that might potentially be adversely affected by the proposed Project. This evaluation is based upon a query of existing database information, existing site conditions based upon the onsite examination, an evaluation of the potential for

sensitive biological resources to occur on and in the vicinity of the Project site, and any respective impacts that could potentially occur. In addition to the evaluation of potential impacts, this report also details the regulatory environment as it relates to biological resources. The Biological Analysis Report can be found in Appendix D.

A review of the California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database (CNDDB) (CDFW 2020) California Native Plant Society (CNPS; CNPS 2020), and United States Fish and Wildlife Service (USFWS) Endangered Species List (USFWS 2020) was conducted to identify special-status plant and wildlife species with the potential to occur within the Project site and vicinity (the surrounding nine quads and a 10-mile radius). Information on the potential presence of wetlands and waters was obtained from the National wetlands Inventory (NWI), National Hydrography database (NHD) and Federal Emergency Management Agency (FEMA). Information regarding the presence of Critical Habitat in the Project vicinity was obtained from the United States Fish and Wildlife Service's Critical Habitat Mapper database. The results of the database inquiries were subsequently reviewed to evaluate the potential for occurrence of special-status species and other sensitive biological resources known to occur on or near the Project site prior to conducting the biological reconnaissance survey.

On April 7th, 8th, and 30th of 2020, QK biologist Lisa Sandoval conducted a biological reconnaissance survey of the entire Project site and a 500-foot buffer area (Biological Survey Area [BSA]). Some areas of the BSA were private lands where access was not available, those areas were evaluated from a distance. General tasks completed during the survey included: inventory plant and wildlife species observed; characterization of vegetation associations and habitat conditions within the BSA; assessment of the potential for federally and State-listed and special-status plant and wildlife species to occur on and near the Project; and assessment for migratory birds and raptors to nest on and near the Project. Survey methodologies included performing vehicular transects along accessible roads, using binoculars to survey areas that were not accessible. Protocol surveys for specific special-status wildlife species have not conducted for this Project. Ground-based photographs were taken to document existing landscapes of the Project site and adjacent land uses; detailed notes on plant and wildlife species encountered and site conditions were recorded while conducting the survey.

### ***General Site Conditions***

The proposed Project area is located on the eastern side of the Central Valley on relatively flat terrain. The Project site, comprised mostly of paved roadway, crosses agricultural lands, irrigation canals and ditches, the riparian area of Berenda Slough, and some fallow lands. The adjacent agricultural areas are comprised mostly of almond orchards and oat fields, the fallow areas are dominated by non-native vegetation and ruderal species. The most southern portion of the Project is within the residential area of Fairmead. The northern extent of the Project is on the north side of Berenda Slough, about a mile south of the City of Chowchilla along Road 16. Wildlife species observed during the survey were typical for urban and agricultural habitats in the Central Valley. Bird species included American crow (*Corvus brachyrhynchos*), house sparrow (*Passer domesticus*), mourning dove, Eurasian collared

dove (*Streptopelia decaocto*), white crowned sparrow (*Zonotrichia leucophrys*), and California scrub jay (*Aphelocoma californica*), great egret (*Ardea alba*), great blue heron (*Ardea herodias*), and red-winged blackbird (*Agelaius phoeniceus*). Two raptors, the Swainson's hawk (*Buteo swainsoni*) and red-tailed hawk (*Buteo jamaicensis*), were observed flying above the Project area and perching in nearby trees. Western spadefoot toads observed (*Spea hammondi*) were in a ponding basin along Fairmead Boulevard and Avenue 22 ¾. California ground squirrels (*Otospermophilus californica*) and their burrows were observed along SR 99 and Road 18 ¾. One den complex with multiple entrances was found at the berm of a basin along Road 18 ¾ and Arc Drive and numerous small mammal burrows were in the north bank of Berenda Slough and along Road 18 ¾. Tables 3.4.4-1 and 3.4.4-2 below contain lists of all plant and wildlife species observed during the recon surveys. The recon survey determined 69 plant species and 26 wildlife species were observed during the surveys.

**Table 3.4.4-2**  
**Plant Species Observed during the Fairmead Sewer Project Reconnaissance Surveys**

Scientific Name	Common Name	Status	Native or Introduced
<b>Trees</b>			
almond	<i>Prunus dulcis</i>	none	introduced
American century plant	<i>Agave americana</i>	none	introduced
blue gum	<i>Eucalyptus globulus</i>	none	Introduced, Cal-IPC limited
China berry tree	<i>Melia azedarach</i>	none	introduced
Chinese juniper	<i>Juniperus chinensis</i>	none	introduced
Chinese elm	<i>Ulmus parvifolia</i>	none	introduced
common fig	<i>Ficus carica</i>	none	introduced
cork oak	<i>Quercus suber</i>	none	introduced
date palm	<i>Phoenix dactylifera</i>	none	introduced
deodar cedar	<i>Cedrus deodara</i>	none	introduced
Fremont cottonwood	<i>Populus fremontii</i>	none	native
Italian cypress	<i>Cupressus sempervirens</i>	none	introduced
kumquat	<i>Citrus japonica</i>	none	introduced
Lemon	<i>Citrus limon</i>	none	introduced
Mexican fan palm	<i>Washingtonia robusta</i>	none	introduced
money tree	<i>Eucalyptus pulverulenta</i>	none	introduced
mulberry	<i>Morus alba</i>	none	introduced
Oleander	<i>Nerium oleander</i>	none	introduced
Olive	<i>Olea europaea</i>	none	Introduced, Cal-IPC limited
orange	<i>Citrus sinensis</i>	none	introduced
ornamental banana plant	<i>Musa</i>	none	introduced
ornamental redwood	<i>Sequoia sempervirens</i>	none	native
Peach	<i>Prunus persica</i>	none	introduced
Peruvian pepper tree	<i>Sonchus asper</i>	none	introduced
purple leaf plum	<i>Prunus cerasifera</i>	none	introduced
sago palm	<i>Cycas revoluta</i>	none	introduced
silk tree	<i>Albizia julibrissin</i>	none	introduced
silver dollar gum	<i>Eucalyptus polyanthemos</i>	none	introduced
spiny-sepaed button celery	<i>Eryngium spinosepalum</i>	1B.2	native

Scientific Name	Common Name	Status	Native or Introduced
sweetgum	<i>Liquidamar styractiflua</i>	none	introduced
Torrey pine	<i>Pinus torreyana</i>	none	native
tree of heaven	<i>Ailanthus altissima</i>	none	Introduced, Cal-IPC moderate
valley oak	<i>Quercus lobata</i>	none	native
weeping willow	<i>Salix babylonica</i>	none	introduced
<b>Shrubs</b>			
poison hemlock	<i>Conium maculatum</i>	none	Introduced, Cal-IPC moderate
<b>Herbs</b>			
black medic	<i>Medicago lupulina</i>	none	introduced
broadleaf filaree	<i>Erodium botrys</i>	none	introduced
common fiddleneck	<i>Amsinckia intermedia</i>	none	introduced
common mallow	<i>Malva neglecta</i>	none	introduced
common mustard	<i>Schinus molle</i>	none	introduced, Cal-IPC limited
common knotweed	<i>Polygonum arenastrum</i>	none	introduced
common sunflower	<i>Helianthus annuus</i>	none	native
curly dock	<i>Rumex crispus</i>	none	introduced, Cal-IPC limited
dwarf brodiaea	<i>Brodiaea terestris</i>	none	native
garden geranium	<i>Pelargonium</i> sp.	none	introduced
hairy vetch	<i>Vicia villosa</i>	none	introduced
honeylocust	<i>Gleditsia triacanthos</i>	none	introduced
miner's lettuce	<i>Claytonia perfoliata</i>	none	introduced
pineappleweed	<i>Matricaria discoidea</i>	none	introduced
popcorn flower	<i>Plagiobothrys</i> sp.	none	native
purple owl's clover	<i>Castilleja exserta</i>	none	native
rose	<i>Rosa</i> sp.	none	introduced
silver leaf nightshade	<i>Solanum elaeagnifolium</i>	none	introduced
spiny sowthistle	<i>Sonchus asper</i>	none	introduced
<b>Grasses</b>			
common spike rush	<i>Eleocharis palustris</i>	none	native
foxtail barley	<i>Hordeum murinum</i>	none	introduced, Cal-IPC moderate
giant reed	<i>Arundo donax</i>	none	introduced, Cal-IPC high
Italian rye grass	<i>Festuca perennis</i>	none	introduced, Cal-IPC moderate
rabbitsfoot grass	<i>Polypogon monspeliensis</i>	none	introduced, Cal-IPC limited
ripgut brome	<i>Bromus diandrus</i>	none	introduced, Cal-IPC moderate
wild oat	<i>Avena fatua</i>	none	introduced, Cal-IPC moderate
<b>Succulents</b>			
Beavertail cactus	<i>Opuntia basilaris</i>	none	native
desert agave	<i>Agave deserti</i> var. <i>simplex</i>	none	introduced
prickly pear cactus	<i>Opuntia engelmannii</i>	none	introduced
San Pedro cactus	<i>Echinopsis pachanoi</i>	none	introduced
Spanish bayonet	<i>Yucca aloifolia</i>	none	introduced

**Table 3.4.4-3**  
**Wildlife Species Observed during the Fairmead Sewer Project Reconnaissance Surveys**

Scientific Name	Common Name	Status	Native or Introduced
<b>Birds</b>			
American crow	<i>Corvus brachyrhynchos</i>	none	introduced
American kestrel	<i>Falco sparverius</i>	none	native
American robin	<i>Turdus migratorius</i>	none	native
Anna's hummingbird	<i>Calypte anna</i>	none	native
Brewer's blackbird	<i>Euphagus cyanocephalus</i>	none	native
California scrub-jay	<i>Aphelocoma californica</i>	none	native
Canada goose	<i>Branta canadensis</i>	none	introduced
Duck	<i>Anas sp.</i>	none	introduced
Eurasian collared-dove	<i>Streptopelia decaocto</i>	none	introduced
great blue heron	<i>Ardea herodias</i>	none	native
great egret	<i>Ardea alba</i>	none	native
house sparrow	<i>Passer domesticus</i>	none	introduced
mallard	<i>Anas platyrhynchos</i>	none	native
mourning dove	<i>Zenaida macroura</i>	none	introduced
Norwegian white geese	<i>Anser caerulescens</i>	none	introduced
red-tailed hawk	<i>Buteo jamaicensis</i>	none	native
red-winged blackbird	<i>Agelaius phoeniceus</i>	none	native
Swainson's hawk	<i>Buteo swainsoni</i>	CT	native
western kingbird	<i>Tyrannus verticalis</i>	none	native
Western spadefoot	<i>Spea hammondi</i>	SSC	native
white crowned sparrow	<i>Zonotrichia leucophrys</i>	none	native
<b>Mammals</b>			
California ground squirrel	<i>Otospermophilus beecheyi</i>	none	native
domestic goat	<i>Capra sp.</i>	none	introduced
guinea fowl	<i>Numida meleagris</i>	none	introduced
Jersey cow	<i>Bos taurus</i>	none	introduced
quarter horse	<i>Equus caballus</i>	none	introduced

This section describes the results of the database searches and, using conditions present on the Project site as determined by the onsite examination, provides an analysis of Project impacts on each of six biological evaluation criteria. Each criterion is discussed below, and mitigation measures are provided when warranted. When implemented the measures provided would reduce impacts to below significant levels.

**Impact #3.4.4a – Would the Project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?**

The database search indicated that there is a potential for three sensitive natural communities and 51 special-status species to be present on the Project site. An evaluation of each of the potentially occurring sensitive natural communities and special-status species,

which included habitat requirements, likelihood of required habitat to occur within the Project area, and a comparison to the CNDDDB records was conducted. This evaluation resulted in a conclusion that no sensitive natural communities are likely to occur on or near the Project site and that nine wildlife species have a low, moderate, or high potential to occur on or near the Project site.

### ***Sensitive Natural Communities and Special Status Species***

#### **SENSITIVE NATURAL COMMUNITIES AND SPECIAL STATUS PLANTS**

According to the CNDDDB and USFWS database query, there are three sensitive natural communities and 23 special status plant species identified as having potential to occur within the subject quadrangle and eight surrounding quadrangles. A CNDDDB record of northern hardpan vernal pool was recorded approximately 3.5 miles to the north of the Project and there were no CNDDDB records of valley sacaton grassland and valley sink scrub within 10 miles of the project (CDFW 2019). The Project site and adjacent lands have been continually disturbed for years given the ongoing agricultural activity, road traffic, and development within and surrounding the City of Fairmead. These land uses decrease the likelihood that suitable conditions to support these sensitive natural communities and special-status plant species would exist on the Project. No sensitive natural communities or special-status plant species occur on or near the Project site.

#### **SPECIAL-STATUS WILDLIFE**

Based on the USFWS and CNDDDB database queries, there were 28 special-status wildlife species identified as having a potential to occur within the USFWS quadrangle search and 10-mile CNDDDB search. Of those 28, only nine species were determined to have potential to occur on or near the Project. They include; Vernal pool fairy shrimp (*Branchinecta lynchi*), Western spadefoot (*Spea hammondi*), Western pond turtle (*Emys marmorata*), Giant garter snake (*Thamnophis gigas*), Burrowing owl (*Athene cunicularia*), Northern harrier (*Circus hudsonius*), Swainson's hawk (*Buteo swainsoni*), American badger (*Taxidea taxus*), and the San Joaquin kit fox (*Vulpes macrotis mutica*). These nine species have a low, moderate, or high potential to occur within the Project site and vicinity. Nesting birds and bat species were also considered in the analysis.

#### ***Vernal Pool Fairy Shrimp***

This species has moderate potential to occur on the Project. There were 16 CNDDDB records of this species within 10 miles of the Project site. The closest record (EONDX 46111) was approximately 0.1 miles west of the Project. The record was observed in 2001 approximately 375 feet of intersection of Highway 99 and Road 19 within tire tracks on the east side of a lateral canal. Based on site conditions during the reconnaissance survey, one wetland approximately 10 feet east of the Project site within a grassland area along Fairmead Boulevard and three vernal pools within a median between SR 99 and Fairmead Boulevard could support this species. There was no water within these features during the



reconnaissance survey, but this species could occur during the wet season when water is present.

#### *Western spadefoot*

This species has high potential to occur on the Project. There were 23 CNDDDB records within 10 miles of the Project with the nearest record 5.5 miles northeast of the Project site. This record (EONDX 114039) documented western spadefoots in 2009 within vernal pools. Based on site conditions during the reconnaissance survey, aquatic resources within the BSA provide habitat that could potentially support breeding and overwintering of western spadefoot during the months when the water is present. Western spadefoots were observed in a ponding basin along Fairmead Boulevard and Avenue 22  $\frac{3}{4}$  where water ponded along the road. There is potential for this species to establish in aquatic features including Berenda Slough, vernal pools, artificial basins, freshwater emergent wetlands, canal/ditches, and roadside ditches anytime water is present.

#### *Western pond turtle*

This species has moderate potential to occur on the Project. There was one CNDDDB record within 10 miles of the Project. This record (EONDX 1893) was collected by Holland, but the date of this record is unknown. Based on site conditions during the reconnaissance survey, Berenda Slough could potentially provide habitat that could support this species. Given that Berenda Slough is an intermittent stream, western pond turtles would likely only be found in the slough during the months when water is present and would nest in upland habitat near the slough during the dry months. Basking structures and refugia sites were limited within the slough, but because the slough is connected via irrigation canal/ditch to ephemeral ponds adjacent to the northwest of the BSA, there is a potential for this species to occur. No western pond turtles were observed during the survey, but this species could occur when there is water present in Berenda Slough.

#### *Giant garter snake*

This species has low potential to occur on the Project. There are no CNDDDB records of this species within 10 miles of the BSA. The closest CNDDDB record (EONDX 1653) is from 1986 and was approximately 28 miles to the northwest of the Project. The location of this record is connected to Berenda Slough via waterways in Mariposa Bypass Canal and Eastside Bypass Canal. The portions of Berenda Slough that are present within the BSA could potentially provide habitat that could support this species. Though there is no public record of water levels and flow in Berenda Slough, the slough banks contain small mammal burrows and adequate cover. The grassy banks and openings in waterside vegetation provide space for basking and the higher elevation uplands provide habitat for cover and refuge from flood waters during the snake's dormant season in the winter. No giant garter snakes were observed during the survey, but this species could occur if there is water present in Berenda Slough during the breeding season between May 1 and October 1.

*Burrowing owl*

This species has moderate potential to occur on the Project. Four CNDDDB occurrences of western burrowing owl were documented within 10 miles of the Project. The nearest CNDDDB record (EONDX 47124) of this species was approximately seven miles northwest of the Project site and documented two adult owls within remnants of Central Valley grasslands in 2016. Based on site conditions during the reconnaissance survey, the annual grassland habitat along Avenue 24 could potentially support nesting and foraging burrowing owls. The owls also could inhabit berms of the canals/ditches that transect the Project and establish burrows within the gores of SR 99 and at the banks of the artificial basins. One den complex with multiple entrances was found at the berm of Basin 1 along Road 18  $\frac{3}{4}$  and Arc Drive but there was no burrowing owl or diagnostic sign (e.g. pellets, whitewash, feathers, prey remnants, etc.) identified at this den. Agricultural fields within and surrounding the Project could also provide potential nesting and foraging habitat. No burrowing owls or diagnostic signs of this species were observed during the reconnaissance survey but there is some potential for burrowing owls to be present from time to time as transient foragers or even to become established near the BSA in the breeding and non-breeding seasons.

*Northern harrier*

This species has moderate potential to occur on the Project. There was one CNDDDB record of this species within 10 miles of the Project. This record (EONDX 101405) was approximately 6.5 miles to the northwest of the BSA and was recorded in 2015 documenting a nesting pair of this species in a wheat field. Nesting and foraging habitat consisting of annual grassland habitat and agricultural fields could support this species within the BSA.

*Swainson's Hawk*

This species has moderate potential to occur on the Project. Sixteen CNDDDB records of Swainson's hawk occurrences were documented within 10 miles of the Project. The nearest record (EONDX 91148) of this species was approximately 1.5 mile north of the BSA along Berenda Slough where a pair was observed building a nest in a cottonwood tree in 2012. Based on site conditions during the reconnaissance survey, nesting and foraging habitat that could support this species exist within the BSA. Riparian habitat along Berenda Slough and eucalyptus tree habitat along Avenue 24, along SR 99, and bordering the residential area of Fairmead provide suitable nesting habitat for this species. Foraging habitat occurs within annual grassland and agricultural fields within and surrounding the Project. Three Swainson's hawks were observed around the Project and one observation was at intersection of SR 99 and South Chowchilla Road approximately 0.3 miles to the west of the Project. There were three old unoccupied stick nests found near the Project and one nest was documented outside of the Project approximately 0.3 miles to the west along SR 99.

*American badger*

This species has low potential to occur on the Project. Three CNDDDB records were documented within 10 miles of the Project. The closest record (EONDX 56648) was 7.5 miles

southwest and documented two badgers in 1986. Based on site conditions during the reconnaissance survey, annual grassland habitat along Berenda Slough could potentially provide denning and foraging habitat that could support this species. One den complex with multiple entrances was found at the berm of Basin 1 along Road 18  $\frac{3}{4}$  and Arc Drive but there was no American badger or diagnostic sign (e.g. claw marks or scat) identified at this den or anywhere else within the BSA. There is some potential for American badgers to be present from time to time as transient foragers or even to establish den within the BSA.

### *San Joaquin Kit Fox*

This species has low potential to occur on the Project. There was one CNDDDB record (EONDX 45340) of this species within 10 miles of the Project and consisted of one adult kit fox observed in 2001 within annual grassland. Based on site conditions during the reconnaissance survey, the annual grassland habitat within the BSA provides suitable denning and foraging habitat, and the surrounding urban and agricultural lands could also support the species and the foxes may pass through the BSA as transients from time to time. One den complex with multiple entrances was found at the berm of Basin 1 along Road 18  $\frac{3}{4}$  and Arc Drive but there was no kit fox or diagnostic sign (e.g. scat, fur, prints, or prey remnants) identified at this den or anywhere else within the BSA. There is some potential for the kit foxes to occur from time to time as transient foragers or even to establish den within the BSA.

### *Nesting Birds*

Nesting bird species have high potential to occur on the Project. Habitat within the BSA supports nesting native bird species, which are protected by the federal MBTA and the California Fish and Game Code. The reconnaissance survey was conducted at the beginning of the nesting bird season (February 1 to September 15). Seven unoccupied nests consisting of three raptor nests and four passerine nests were identified in the trees within the BSA and swallow nests were present at Road 16 bridge over Berenda Slough. Various species of migratory birds will construct nests in a variety of habitats and structures, and more nests may be found in trees or shrubs, man-made structures, and directly on the ground with the progress of the nesting season. Because the BSA support several types of habitat suitable for nesting birds, it is likely that birds will nest within the BSA.

### *Bats*

Bat species have moderate potential to occur on the Project. Habitat within the BSA provides roosting and foraging habitat that could support special-status bat species and maternity colonies of bats which are protected during the maternity season by the California Fish and Game Code. The riparian habitat along Berenda Slough could provide day roosting habitat in eucalyptus trees, cottonwood trees, and oak trees and the Road 16 bridge over Berenda Slough could be utilized by night roosting bats. Swallow nests at Road 16 bridge and eucalyptus trees within the residential area of Fairmead along Avenue 24 could also provide day roosting habitat and be inhabited by bats. Signs of night roosting bats consisting of urine

stains and small amount of guano were documented at and below the Road 16 bridge during the time of the survey.

The following measures shall be implemented to ensure adequate protection and avoidance of these special-status species and nesting migratory birds and raptors.

**MM BIO-1:** Within 14 days of the start of Project activities, a pre-activity survey for spiny-sepaled button celery, western spadefoot, western pond turtle, western burrowing owl, northern harrier, hoary bat, Yuma myotis, San Joaquin kit fox, and American badger shall be conducted by a qualified biologist knowledgeable in the identification of these species. The pre-activity survey should include survey of: (1) Aquatic resources and grassy areas with moist conditions including the wetlands, vernal pools, artificial basins, and road ditches to determine presence of spiny-sepaled button celery, (2) Aquatic resources within the BSA including Berenda Slough, canals and ditches, emergent wetlands, vernal pools, artificial basins, road ditches, and puddles to determine presence of western spadefoot; (3) Berenda Slough to determine presence of western pond turtle, (4) Annual grassland habitat, gores along SR 99, and berms along the canals/ditches to identify presence of burrowing owls and their burrows, (5) Annual grassland and dryland grain crops to identify presence of northern harries, (6) Annual grassland and the riparian habitat along Berenda Slough to determine presence of American badgers and their dens, (7) Annual grassland to determine presence of San Joaquin kit foxes and their dens, and (8) Eucalyptus, cottonwood, and oak trees along Berenda Slough as well as the Road 16 bridge to determine presence of roosting bats. The transects shall be spaced at no greater than 30-foot intervals in order to obtain a 100 percent coverage of the Project site and a 250-foot buffer. Areas devoid of habitat incapable of supporting these species will not require surveys. If no evidence of these special-status species is detected, no further action is required.

**MM BIO-2:** If spiny-sepaled button celery is documented during the pre-activity survey within the area of Project disturbance, the species occurrences shall be mapped using Geographic Information Systems (GIS) and shall be avoided to the most possible extent. If the spiny-sepaled button celery cannot be avoided and needs to be removed, the designated biologists shall assure that self-sustaining population of this species remains in place.

**MM BIO-3:** Because there is potential for vernal pool fairy shrimp to occur within wetland W1 along Fairmead Boulevard, this wetland shall be avoided during construction of the proposed alignment to assure no impact to these species will occur. If avoidance is not feasible, protocol level survey following the *Survey Guidelines for the Listed Large Branchiopods* (USFWS 2015) shall be conducted during the wet season to determine presence/absence of this species. If vernal pool fairy shrimp are identified or it is assumed that vernal pool fairy shrimp are present, a Biological Opinion from the USFWS shall be required. Impacts to vernal pool fairy shrimp will be mitigated with habitat replacement at a three to one ratio with an approved mitigation bank.

**MM BIO-4:** Because western spadefoot was identified during the reconnaissance survey within the BSA, Environmentally Sensitive Area (ESA) fencing capable of precluding western spadefoots from entering construction areas will be installed anywhere where western

spadefoots would be identified during the pre-construction survey or during the duration of the Project. Fencing shall consist of 16-inch metal flashing or an equivalent material and shall be buried six inches below the ground surface, extending at least eight inches above the ground. If a western spadefoot is encountered during construction, the toad will be encouraged to leave the premises. If the toad does not leave on its own, it will be relocated to the wetland (W1) that was observed in the BAR.

**MM BIO-5:** If during the construction period the Berenda Slough is inundated, weekly examinations of slough shall occur to determine presence of western pond turtles. If western pond turtles are found in Berenda Slough, barrier fencing will be installed between the stream and upland habitat to prevent entrance into work areas along the banks of the slough. Fencing will consist of 16-inch metal flashing or an equivalent material and will be buried six inches below the ground surface, extending at least 8 inches above the ground. If western pond turtles are found in upland habitat within the work area, a 100-foot buffer will be set up around nearby construction zones to prohibit turtles from entering work areas, and turtles will be relocated to similar habitat in which they are found or in other suitable habitat (e.g., downstream) outside the 100-foot buffer.

**MM BIO-6:** If Project activities must occur during the nesting season (February 15 to August 31), pre-activity surveys will be conducted for Swainson's hawk nests in accordance with the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (CDFW 2020). The surveys will be conducted on and within 0.5-mile buffer of the Project. To meet the minimum level of protection for the species, surveys shall be conducted during at least two survey periods.

**MM BIO-7:** If an active Swainson's hawk nest is discovered at any time within 0.5 miles of active construction, a qualified biologist shall complete an assessment of the potential for current construction activities to impact the nest. The assessment will consider the type of construction activities, the location of construction relative to the nest, the visibility of construction activities from the nest location, and other existing disturbances in the area that are not related to construction activities of this Project. Based on this assessment, the biologist will determine if construction activities can proceed and the level of nest monitoring required. Construction activities shall not occur within 500 feet of an active nest but depending upon conditions at the site this distance may be reduced. Full-time monitoring to evaluate the effects of construction activities on nesting Swainson's hawks may be required. The qualified biologist shall have the authority to stop work if it is determined that Project construction is disturbing the nest. These buffers may need to increase depending on the sensitivity of the nesting Swainson's hawk to disturbances and at the discretion of the qualified biologist. Construction that requires coming within 500 feet of an active nest must obtain an Incidental Take Permit (ITP) from the California Department of Fish and Wildlife.

**MM BIO-8:** The following avoidance and minimization measures will be implemented during all phases of the Project to reduce the potential for impact from the Project. They are modified from the *U.S. Fish and Wildlife Service Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance* (USFWS, 2011).

- Project-related vehicles shall observe a daytime speed limit of 20-mph throughout the site in all Project areas, except on County roads and State and federal highways.
- All Project activities shall occur during daylight hours, but if work must be conducted at night then a night-time construction speed limit of 10-mph shall be established.
- Off-road traffic outside of designated Project areas shall be prohibited.
- To prevent inadvertent entrapment of kit foxes or other animals during construction of the Project, all excavated, steep-walled holes or trenches more than two feet deep shall 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 shall be installed.
- Before holes or trenches are filled, they shall be thoroughly inspected for trapped animals. If at any time a trapped or injured kit fox is discovered, the USFWS and the CDFW will be contacted before proceeding with the work.
- In the case of trapped animals, escape ramps or structures shall be installed immediately to allow the animal(s) to escape, or the USFWS and CDFW should be contacted for guidance.
- All construction pipes, culverts, or similar structures with a diameter of four inches or greater that are stored at a construction site for one or more overnight periods shall be thoroughly inspected for kit foxes and burrowing owls 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 shall 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.
- All food-related trash items such as wrappers, cans, bottles, and food scraps shall be disposed of in securely closed containers and removed at least once a week from a construction or Project site.
- No pets, such as dogs or cats, shall be permitted on the Project site.
- Project-related use of rodenticides and herbicides shall be restricted.
- A representative shall be appointed by the Project proponent who will be the contact source for any employee or contractor who might inadvertently kill or injure a kit fox or who finds a dead, injured or entrapped kit fox. The representative shall be identified during the employee education program and their name and telephone number shall be provided to the USFWS and CDFW.
- Upon completion of the Project, all areas subject to temporary ground disturbances (including storage and staging areas, temporary roads, pipeline corridors, etc.) shall be recontoured if necessary, and revegetated to promote restoration of the area to pre-Project conditions. An area subject to "temporary" disturbance means any area that is disturbed during the Project, but after Project completion will not be subject to further disturbance and has the potential to be revegetated.
- Any Project personnel who are responsible for inadvertently killing or injuring one of these species shall immediately report the incident to their representative. This representative shall contact the CDFW (and USFWS in the case of San Joaquin kit fox) immediately in the case of a dead, injured or entrapped San Joaquin kit fox, American badger, or western burrowing owl.

- The Sacramento Fish and Wildlife office and CDFW Region 4 office shall be notified in writing within three working days of the accidental death or injury to a San Joaquin kit fox during Project related activities. The CDFW shall be notified in the case of accidental death to an American badger or western burrowing owl. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal and any other pertinent information.
- New sightings of San Joaquin kit fox, American badger, or western burrowing owl shall be reported to the CNDDDB. A copy of the reporting form and a topographic map clearly marked with the location of where a San Joaquin kit fox was observed should also be provided to the USFWS.

**MM BIO-9:** If Project activities must occur during the nesting season (February 1 to September 15), pre-activity nesting bird surveys shall be conducted within seven days prior to the start of construction at the construction site plus a 250-foot buffer for songbirds and a 500-foot buffer for raptors (other than Swainson's hawk). If no active nests are found, no further action is required. However, existing nests may become active and new nests may be built at any time prior to and throughout the nesting season, including when construction activities are in progress. If active nests are found during the survey or at any time during construction of the Project, an avoidance buffer ranging from 50 feet to 500 feet may be required, with the avoidance buffer from any specific nest being determined by a qualified biologist. The avoidance buffer shall remain in place until the biologist has determined that the young are no longer reliant on the adults or the nest. Work may occur within the avoidance buffer under the approval and guidance of the biologist, but full-time monitoring may be required. The biologist shall have the ability to stop construction if nesting adults show any sign of distress.

**MM BIO-10:** If sign of day roosting bats is identified within the BSA during the pre-activity survey, a follow up flyout inspection of the potential roost shall be conducted at dusk. If roosting bats are found to be present, then acoustical sampling will be conducted to determine species. If any special-status species bats or maternity colony of bats are identified, appropriate mitigation measures to avoid impact and disturbance to these species will be developed. If any other bats are identified roosting during the maternity season (May through August), measures to avoid impact and disturbance to these bats will be developed.

#### **LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact with these measures incorporated*.

**Impact #3.4.4b – Would the Project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?**

According to CNDDDB recorded occurrences, there are three sensitive natural communities within 10 miles of the Project site. The Project site and adjacent lands have been continually disturbed for years given the ongoing agricultural activity, road traffic, and development

within and surrounding the City of Fairmead. The Project site is comprised mostly of paved roadway, crosses agricultural lands, irrigation canals fallow lands, and artificial ditches. No sensitive natural communities exist on the Project site or within the Survey Area.

Riparian habitat is defined as lands that are influenced by a river, specifically the land area that encompasses the river channel and its current or potential floodplain. The alignment will encounter the Berenda Slough as well as three irrigation canals. The preferred method to cross the Berenda Slough would be to attach the pipeline to the bridge that passes over the slough; this would be the least invasive and cheapest option.

However, subsequent environmental review may be required if proposed attachment to the bridge cannot be completed and must instead jack and bore the pipeline beneath the Berenda Slough. The jack and bore method will be applied to the Berenda Canal, the Califa Lateral A, and the Califa Canal. Impacts to riparian habitat will be determined in an aquatic resource delineation prior to construction. MM BIO-11 will be implemented in order to mitigate potential impacts to riparian habitat.

#### **MITIGATION MEASURE(S)**

**MM BIO-11:** During construction, all efforts shall be made to avoid riparian habitat. The best method of confronting the Berenda Slough's riparian habitat would be to attach the pipeline to the bridge that crosses the slough. Prior to construction, an aquatic resource delineation shall be completed to determine the amount of riparian habitat within the Project site that may be impacted by proposed activities. In the event that riparian habitat is identified as being impacted, consultation with the CDFW shall be conducted to determine permitting needs and, if required, impacts to trees and vegetation in riparian habitat shall be replaced at a ratio of up to three to one.

#### **LEVEL OF SIGNIFICANCE**

The Project would have *a less than significant impact with mitigation incorporated.*

**Impact #3.4.4c – Would the Project 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?**

The United States Army Corps of Engineers (USACE) has regulatory authority over the Clean Water Act (CWA), as provided for by the EPA. The USACE has established specific criteria for the determination of wetlands based upon the presence of wetland hydrology, hydric soils, and hydrophilic vegetation. There are no federally protected wetlands, waters of the United States, or vernal pools that occur within the Project site.

Wetlands, streams, reservoirs, sloughs, and ponds typically meet the criteria for federal jurisdiction under Section 404 of the CWA and State regulatory authority under the Porter-Cologne Water Quality Control Act. Streams and ponds typically meet the criteria for State regulatory authority under Section 1602 of the California Fish and Game Code.



The proposed Project alignment will be placed within the existing right-of-way which may be adjacent to road shoulders and in other non-vegetated, non-wetland areas, eliminating potential impacts to wetlands. However, since the Project's alignment is only proposed and is not the final Project design, there is potential to encounter wetlands should adjustments to the proposed alignment be necessary. Adjustments between the 30 percent and 100 percent design plans could result in a shift of the Project of a few feet but would not change the primary alignment of the Project. Although it is unlikely that the proposed alignment will change, there is still a minimal chance to encounter wetlands within the slight shift of the pipeline alignment. In order to ensure that wetlands will not be impacted once Project design plans are finalized, a wetland delineation will be completed prior to construction permitting. In the event that wetlands are discovered during the wetland delineation, MM BIO-12 will be implemented in order to mitigate potential impacts.

#### **MITIGATION MEASURE(S)**

**MM BIO-12:** Prior to construction, a wetland delineation shall be completed to determine the amount of wetlands within the Project site that may be impacted by the proposed Project using standard wetland delineation measures required by the USACE. In the event that wetland resources, permits from the USACE, RWQCB, and CDFW for impacts to wetland resources may need to be acquired. It is assumed that the Project will be granted a nationwide permit from the USACE. Under the nationwide permit, impacts to aquatic and wetland resources greater than 1/10<sup>th</sup> of an acre shall be compensated by in-kind compensatory credits at an approved mitigation bank or by utilizing an in-lieu fee program.

#### **LEVEL OF SIGNIFICANCE**

The Project would have *a less than significant impact with mitigation incorporated.*

**Impact #3.4.4d – Would the Project interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?**

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

The proposed Project is not located within mapped regional major wildlife movement corridor or linkage but Berenda Slough riparian corridor serves as a locally important movement corridor for wildlife moving to and from the Chowchilla River. The proposed Project could be disruptive to wildlife moving through the area when construction is occurring. However, this disruption is likely to be minimized by the short duration of the Project in this area. Furthermore, no permanent barriers to wildlife movement are

anticipated to be installed by the Project. Based on this, impacts to wildlife movement would be less than significant.

The proposed Project site is not a known major wildlife nursery site but does support bird nesting. Construction activities during breeding seasons could result in impacts if Project activities disrupt normal behaviors leading to the injury or death of young.

**MITIGATION MEASURE(S)**

No mitigation is required.

**LEVEL OF SIGNIFICANCE**

There would be *less-than-significant impact with mitigation incorporated*.

**Impact #3.4.4e – Would the Project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?**

The proposed Project does not conflict with the Madera County General Plan. There are no impacts with respect to local policies and ordinances and no measures are warranted.

**MITIGATION MEASURE(S)**

No mitigation is required.

**LEVEL OF SIGNIFICANCE**

There would be *no impact*.

**Impact #3.4.4f – Would the Project conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or State habitat conservation plan?**

The Project is located within an area covered by the PG&E San Joaquin Valley Operation and Maintenance HCP. This HCP applies only to PG&E's activities and does not apply to this Project.

**MITIGATION MEASURE(S)**

No mitigation is required.

**LEVEL OF SIGNIFICANCE**

There would be *no impact*.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than- Significant Impact	No Impact
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### 3.4.5 - CULTURAL RESOURCES

Would the Project:

a. Cause a substantial adverse change in the significance of a historical resource pursuant to CEQA Guidelines Section 15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### Discussion

This section is based on a cultural report prepared by Culturescape (Appendix E).

#### Impact #3.4.5a – Would the Project cause a substantial adverse change in the significance of a historical resource pursuant to CEQA Guidelines Section 15064.5?

As defined by CEQA Guidelines Section 15064.5, “historical resources” are:

- A resource listed in or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources (Public Resource Code Section 5024.1, Title 14 California Code of Regulations, Section 4850 et seq.).
- A resource included in a local register of historical resources, as defined in Section 5020.1(k) of the Public Resources Code or identified as significant in a historical resource survey meeting the requirements Section 5024.1(g) of the Public Resources Code, shall be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant.
- Any object, building, structure, site, area, place, record, or manuscript which a Lead Agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be an historical resource, provided the Lead Agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource shall be considered by the Lead Agency to be "historically significant" if the resource meets the criteria for listing on the California Register of Historical Resources (Public Resources Code Section 5024.1, Title 14 CCR, Section 4852) including the following:

- Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
- Is associated with the lives of persons important in our past;
- 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; or
- Has yielded, or may be likely to yield, information important in prehistory or history.

Research into the Project site's cultural significance consisted of a records search of recorded historical and archaeological sites and maps of the affected area by personnel at the Southern San Joaquin Information Center (SSJVIC), a literature review of historic and archaeological data pertaining to the area in questions, and a field survey. In accordance with AB 52, Native American Correspondence was pursued for information regarding the Project area. On February 3<sup>rd</sup>, 2020, a response from the Native American Heritage Commission provided the contacts for four tribes to consult. The Dumna Wo-Wah Tribal Government, the North Valley Yokuts Tribe, the Southern Sierra Miwuk Nation, and the Wuksache Indian Tribe/Eshom Valley Band were sent letters of opportunity for consultation. Follow up letters were sent out on March 2<sup>nd</sup>, 2020. The City did not receive any requests for consultation from the tribes.

The Records Search from the California Historical Resources Information System's Southern San Joaquin Valley Information Center (SSJVIC) at California State University, Bakersfield on April 13, 2020 encompassed the Project area plus all land within a 0.5-mile radius of the Project. SSJVIC staff consulted archaeological site and survey base maps, reports of previous investigations, cultural resource records, the listings of the National Register of Historic Places, the Historic Property Data File (March 3, 2013), the California Historical Landmarks, the California Register of Historical Resources, the California Inventory of Historic Resources, and the California Points of Historical Interest.

The records search conducted by the SSJVIC resulted in no previously reported cultural resources within the Project area. However, due to the possible presence of undocumented tribal or cultural resources within the Project site, construction related impacts on tribal or cultural resources could be potentially significant prior to mitigation. Implementation of the following mitigation measure would require appropriate steps to preserve and/or document any previously undiscovered resources that may be encountered during construction activities, including human remains.

#### **MITIGATION MEASURE(S)**

**MM CUL-1:** At a minimum, a Worker Environmental Awareness Training shall take place with those responsible for work prior to earthwork.

**MM CUL-2:** An archeological monitor shall be present during initial subsurface work on Maple Street, Sinclair Street, Elm Street, and Avenue 22 ½, Avenue 23 ¾, and Yates Avenue.

**MM CUL-3:** If prehistoric or historic-era cultural materials are encountered during construction activities, all work in the immediate vicinity of the find shall halt until a qualified archaeologist can evaluate the find and make recommendations. Cultural resource materials may include prehistoric resources such as flaked and ground stone tools and debris, shell, bone, ceramics, and fire-affected rock as well as historic resources such as glass, metal, wood, brick, or structural remnants. If the qualified archaeologist determines that the discovery represents a potentially significant cultural resource, additional investigations may be required to mitigate adverse impacts from Project implementation. These additional studies may include avoidance, testing, and evaluation or data recovery excavation. Implementation of the mitigation measure below would ensure that the proposed Project would not cause a substantial adverse change in the significance of a historical resource. Therefore, the Project would have a less-than-significant impact with incorporation of mitigation measures.

#### **LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact with mitigation incorporated*.

**Impact #3.4.5b – Would the Project cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5?**

See discussion of Impact #3.4.5a, above.

#### **MITIGATION MEASURE(S)**

Implementation of Mitigation Measures MM CUL-1 and MM CUL-2.

#### **LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact with mitigation incorporated*.

**Impact #3.4.5c – Would the Project disturb any human remains, including those interred outside of formal cemeteries?**

Although unlikely, subsurface construction activities, such as trenching and grading, associated with the proposed Project could potentially disturb previously undiscovered human burial sites. Accordingly, this is a potentially significant impact. Although considered unlikely subsurface construction activities could cause a potentially significant impact to previously undiscovered human burial sites. The records search conducted by the SSJVIC resulted in no previously reported cultural resources within the Project area. However, construction would involve earth-disturbing activities, and it is still possible that human remains may be discovered, possibly in association with archaeological sites. Implementation of the below mitigation measure would ensure that the proposed Project would not directly or indirectly destroy previously unknown human remains. The proposed Project would not disturb any known human remains, including those interred outside of formal cemeteries. Therefore, the Project would have a less-than-significant impact with incorporation of mitigation measures.

**MITIGATION MEASURE(S)**

**MM CUL-4:** If human remains are discovered during construction or operational activities, Section 7050.5 of the California Health and Safety Code applies, and the following procedures shall be followed: There shall be no further excavation or disturbance of the area where the human remains were found until the County Coroner/Sheriff's Office is contacted. Duly authorized representatives of the Coroner shall be permitted onto the Project site and shall take all actions consistent with Health and Safety Code Section 7050.5 and Government Code Section 27460, et seq. Excavation or disturbance of the area where the human remains were found or within 50 feet of the find shall not be permitted to recommence until the Coroner determines that the remains are not subject to the provisions of law concerning investigation of the circumstances, manner, and cause of any death. If the Coroner determines the remains are Native American, the Coroner shall contact the NAHC within 24 hours, and the NAHC shall identify the person or persons it believes to be the "most likely descendant" (MLD) of the deceased Native American. The MLD may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in PRC Section 5097.98.

**LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact with mitigation incorporated*.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than- Significant Impact	No Impact
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### 3.4.6 - ENERGY

Would the Project:

- |    |  |                          |                          |                                     |                          |
|----|--|--------------------------|--------------------------|-------------------------------------|--------------------------|
| a. | Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during Project construction or operation? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b. | Conflict with or obstruct a State or local plan for renewable energy or energy efficiency?   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Discussion

**Impact #3.4.6a – Would the Project result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during Project construction or operation?**

Electricity and natural gas in Madera County are provided primarily by PG&E, and PG&E is regulated by the California Public Utilities Commission (CPUC). Title 24, Part 11 of the California Code of Regulations, known as the CalGreen Code, was established to reduce environmental impacts during and after construction, and reduce construction waste. Additionally, San Joaquin Valley Air Pollution Control District Regulation VIII Control Measures include requirements for the use of fuel-efficient construction vehicles and equipment.

The Project is the construction of a wastewater collection system in the Community of Fairmead with connections to the existing wastewater treatment facility in the City of Chowchilla, and includes a (1) gravity collection system to receive wastewater from approximately 177 connections, (2) lift station and force main on a one-acre site, and (3) new 0.9 MGD wastewater treatment facility to increase the effective facility capacity to 1.8 MGD.

Energy demand during the construction phase would result from the transportation of materials, construction equipment, and construction worker vehicle trips. Construction equipment includes scrapers, motor graders (blades), vibrators and static compactors, 3500 gallon water trucks, track excavators, graders, off-highway trucks, rubber-tired loaders and backhoes, concrete trucks tractors, concrete extrusion machine, cranes, forklifts, generator sets, pavers, air compressors and rollers.

There are no unusual Project characteristics that would cause construction equipment to be less energy efficient compared with other similar construction sites in other areas within the

State. Construction related fuel consumption is not expected to result in inefficient, wasteful, or unnecessary energy use. The Project will comply with the CalGreen Code, SJVAPCD Regulation VIII Control Measures, Madera County Municipal Code, and all applicable PG&E Design Criteria and Standards.

The short-term increase in energy use associated with the project construction will be consistent with all applicable plans and standards, and the Project operations will return to its existing conditions upon Project completion. Therefore, the Project would have a less-than-significant impact.

#### **MITIGATION MEASURE(S)**

No mitigation is required.

#### **LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact*.

#### **Impact #3.4.6b – Would the Project Conflict with or obstruct a State or local plan for renewable energy or energy efficiency?**

The Project must comply with the California Green Building Standards Code (California Code of Regulations, Title 24, Part 11), commonly referred to as the CalGreen Code, went into effect on January 1, 2014, with energy provisions effective July 1, 2014. The 2013 CalGreen Code includes mandatory measures for non-residential development related to site development; water use; weather resistance and moisture management; construction waste reduction, disposal, and recycling; building maintenance and operation; pollutant control; indoor air quality; environmental comfort; and outdoor air quality. Mandatory measures for residential development pertain to green building; planning and design; energy efficiency; water efficiency and conservation; material conservation and resource efficiency; environmental quality; and installer and special inspector qualifications (California Building Standards Commission, 2019).

The Project will also comply with SJVAPCD Regulation VIII Control Measures which include recommended mitigation measures for heavy duty construction equipment that will reduce energy consumption, including the use of alternative fueled or catalyst equipped diesel construction equipment, minimize idling time (i.e. five minute maximum), and limit the hours of operation of heavy duty equipment and/or the amount of equipment in use.

There are no unusual Project characteristics that would cause construction equipment to be less energy efficient compared with other similar construction sites in other areas within the State. Construction related fuel consumption is not expected to result in inefficient, wasteful, or unnecessary energy use. The Project will comply with the CalGreen Code, SJVAPCD Regulation VIII Control Measures, Madera County Municipal Code, and all applicable PG&E Design Criteria and Standards.



The Project's compliance with all applicable State and local plans and standards would minimize fuel consumption during construction, and would not result in inefficient, wasteful, or unnecessary energy use.

Based on the assessment above, the Project will not conflict with or obstruct a State or local plan for renewable energy or energy efficiency and will not increase energy consumption associated with long-term (operational) activities. The short-term increase in energy use associated with the project construction will be consistent with all applicable plans and standards, and the Project operations will return to existing conditions upon Project completion. Therefore, the Project would have a less-than-significant impact.

***MITIGATION MEASURE(S)***

No mitigation is required.

***LEVEL OF SIGNIFICANCE***

The Project would have a *less-than-significant impact*.

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than- Significant Impact	No Impact
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### 3.4.7 - GEOLOGY AND SOILS

Would the Project:

- a. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:
  - i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.
  - ii. Strong seismic ground shaking?
  - iii. Seismic-related ground failure, including liquefaction?
  - iv. 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 offsite landslide, lateral spreading, subsidence, liquefaction, or collapse?
- d. 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?
- e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater?

<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

- f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? ☐ ☒ ☐ ☐

### ***Discussion***

**Impact #3.4.7a(i) – Would the Project 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?**

The proposed Project site is not located in an Alquist-Priolo Fault Zone (California Department of Conservation, 2017). The San Andreas Fault lies to the west of Madera County, approximately 45 miles from the county line. The Clovis Fault, approximately 25 miles south of the Project site, is “potentially active” (active within the last two million years), but given the nature of the Project, the construction and operation of the Project would not increase the potential exposure of persons living and working on the Project site to dangerous seismic events.

#### ***MITIGATION MEASURE(S)***

No mitigation is required.

#### ***LEVEL OF SIGNIFICANCE***

The Project would have a *less-than-significant impact*.

**Impact #3.4.7a(ii) – Would the Project expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking?**

In the event that an earthquake was to occur on a nearby fault, it is likely that the Project site would experience ground shaking and expose people and structures associated with the Project, to ground shaking. However, structures constructed as part of the Project would be required by State law to be constructed in accordance with all applicable International Building Code (IBC) and California Building Code (CBC) earthquake construction standards, including those relating to soil characteristics. Adherence to these regulations would avoid any potential impacts to structures resulting from strong seismic ground shaking.

#### ***MITIGATION MEASURE(S)***

No mitigation is required.

#### ***LEVEL OF SIGNIFICANCE***

The Project would have a *less-than-significant impact*.

**Impact #3.4.7a(iii) – Would the Project expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction?**

Liquefaction could result in local areas during a strong earthquake or seismic ground shaking where unconsolidated sediments and a high-water table coincide. The subsurface soils generally consist of clays and clay loams. These soils typically have a high moisture-holding capacity, frequent irrigation is not required and hazard for erosion is slight.

The Project would not expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure including liquefaction. As mentioned previously, structures constructed as part of the Project would be required by State law to be constructed in accordance with all applicable IBC and CBC earthquake construction standards, including those relating to soil characteristics. Adherence to all applicable regulations would avoid any potential impacts to structures resulting from liquefaction at the Project site. Therefore, there would be less-than-significant impacts as a result of ground failure and liquefaction.

**MITIGATION MEASURE(S)**

No mitigation is required.

**LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact*.

**Impact #3.4.7a(iv) – Would the Project expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving landslides?**

There is no potential for rock fall and landslides to impact the site in the event of a major earthquake, as the proposed site and surrounding areas are flat and do not include dramatic elevation changes. Based on estimated maximum horizontal accelerations at the Project site, historical seismic and landslide activities in the Project area, and the soil types of the Project area, minor subsurface settlement may occur on site during a major earthquake and this is considered less than significant.

**MITIGATION MEASURE(S)**

No mitigation is required.

**LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact*.

**Impact #3.4.7b – Would the Project result in substantial soil erosion or the loss of topsoil?** Construction activities associated with the proposed Project would temporarily disrupt surface vegetation and/or soils that would expose these disturbed areas to erosion by wind and water. National Pollutant Discharge Elimination System (NPDES) stormwater

permitting programs regulate stormwater quality from construction sites, which includes erosion and sedimentation. Under the NPDES permitting program, the preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP) is required for construction activities that would disturb an area of one acre or more. As noted in *Section 3.4.10 - Hydrology and Water Quality*, Impact #3.4.10a., a SWPPP must identify potential sources of erosion or sedimentation that may be reasonably expected to affect the quality of stormwater discharges as well as identify and implement BMPs that ensure the reduction of these pollutants during stormwater discharges. Typical BMPs intended to control erosion include sandbags, detention basins, silt fencing, storm drain inlet protection, street sweeping, and monitoring of water bodies. Mitigation Measure MM HYD-1 requires the approval of a SWPPP to comply with the NPDES General Construction Permit from the Central Valley Regional Water Quality Control Board (RWQCB). With the implementation of mitigation measure MM HYD-1, impacts due to soil erosion would be less than significant.

#### **MITIGATION MEASURE(S)**

Implementation of Mitigation Measure MM HYD-1.

#### **LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact with mitigation incorporated*.

**Impact #3.4.7c – Would the Project 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 offsite landslide, lateral spreading, subsidence, liquefaction, or collapse?**

Since the Project site is considerably flat with little to no topographic relief and the soils in the Project area are composed of sandy loam and loamy sand, making them stable and not susceptible to landslide, lateral spreading, subsidence, or liquefaction the potential for soil instability is very low, as seen in Figure 3.4.7-1. Therefore, the Project would have a less-than-significant impact on soil stability.

#### **MITIGATION MEASURE(S)**

No mitigation is required.

#### **LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact*.

**Impact #3.4.7d – Would the Project 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?**

Since the soil that is found in the Project area tends to be sandy loams with layers that contain significant amount of clay, the soil is moderately well drained. Although certain clays can exhibit expansion and contraction characteristics, any issues with this can generally be



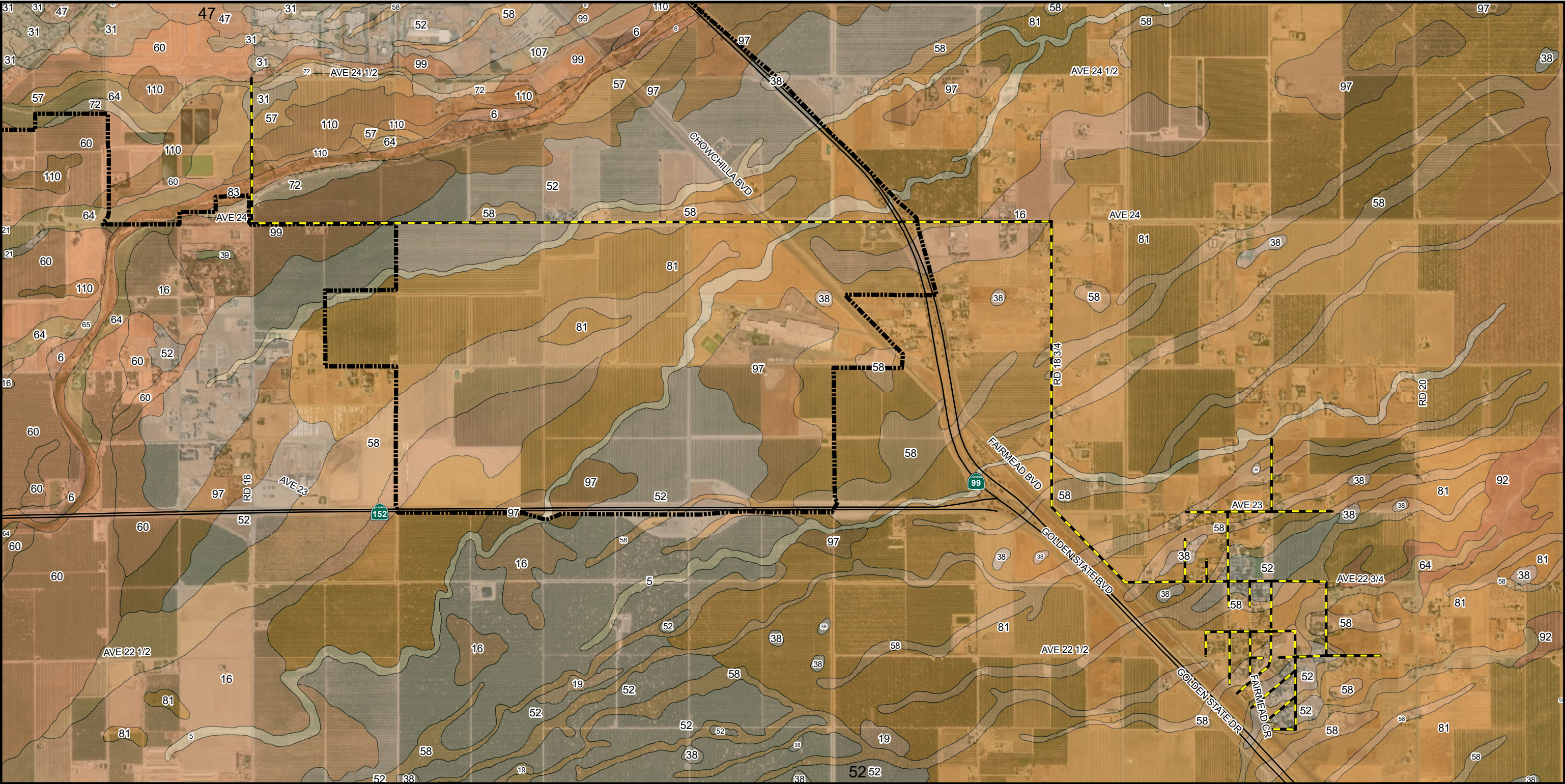
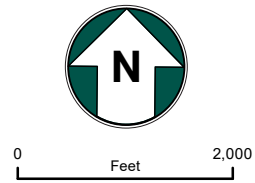


Figure 3.4.7-1 USGS SSURGO Soil Survey



- |                                |   |                                 |                              |                             |
|--------------------------------|---|---------------------------------|------------------------------|-----------------------------|
| 107: Hanford sandy loam        | 31: Fresno and El Peco fine sandy loams | 57: Pachappa fine sandy loam    | 65: Visalia sandy loam       | 92: Cometa sandy loams      |
| 110: Traver loam               | 38: Alamo clay                          | 58: Ramona sandy loam           | 6: Tujunga and Hanford soils | 97: Greenfield sandy loam   |
| 16: Atwater loamy sand         | 39: Water                               | 5: Greenfield coarse sandy loam | 72: Delhi sand               | 99: Hanford fine sandy loam |
| 19: Madera-Alamo complex       | 47: Fresno and El Peco loams            | 60: Grangeville fine sandy loam | 81: San Joaquin sandy loam   |                             |
| 21: Wunje very fine sandy loam | 52: Madera fine sandy loam              | 64: Tujunga loamy sand          | 83: Riverwash                |                             |
- Project Site  
 Chowchilla City Limit





addressed through standardized foundation engineering practices. Additionally, the construction of the Project will consistent with the Uniform Building Code as well as County and State standards. Therefore, the impact is considered less than significant.

**MITIGATION MEASURE(S)**

No mitigation is required.

**LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact*.

**Impact #3.4.7e – Would the Project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater?**

The proposed Project involves the construction of a force main, a residential collection system, and pump station in order to abandon the septic tanks that are currently in place throughout the Community. The implementation of the Project will be designed to meet all applicable State and local codes and regulations. Therefore, the Project would have no impact.

**MITIGATION MEASURE(S)**

No mitigation is required.

**LEVEL OF SIGNIFICANCE**

The Project would have *no impact*.

**Impact #3.4.7f – Would the Project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?**

In a Paleontological Resources Technical Report prepared by Paleo Services (see Appendix D), the Project alignment was determined to be immediately underlain by potentially fossil-bearing sedimentary deposits of the Modesto Formation, Riverbank Formation, and Turlock Lake Formation. Impacts to paleontological resources may occur during excavations within previously undisturbed deposits of these geologic units. Mitigation measures have been established to avoid directly or indirectly destroying unique paleontological resources or unique geologic features. Within mitigation incorporated, the impacts are less than significant.

**MITIGATION MEASURE(S)**

**MM GEO-1:** Prior to the start of earthwork, a qualified Project Paleontologist shall be retained to oversee the paleontological mitigation program and should attend the pre-

construction meeting to consult with Project contractors concerning excavation schedules, paleontological field techniques, and safety issues.

**MM GEO-2:** A paleontological monitor shall be onsite during all excavations along the Project alignment that will directly impact the Modesto Formation, Riverbank Formation, and Turlock Lake Formation, with the exception of horizontal drilling for jack and bore installation. The paleontological monitor should be equipped to salvage fossils as they are unearthed (including bulk matrix samples containing microvertebrate fossils) to avoid construction delays. Paleontological monitoring may be reduced (e.g., part-time monitoring or spot-checking) or eliminated, at the discretion of the Project Paleontologist and in consultation with appropriate agencies (e.g., Project proponent, City of Chowchilla representatives). Changes to the paleontological monitoring schedule shall be based on the results of mitigation program as it unfolds during site development, and current and anticipated conditions in the field.

**MM GEO-3:** If fossils are discovered, the Project Paleontologist (or paleontological monitor) should make an initial evaluation to determine their significance. All identifiable vertebrate fossils (large or small) and uncommon invertebrate, plant, and trace fossils are considered to be significant and should be recovered. Representative samples of common invertebrate, plant, and trace fossils should also be recovered, all effort should be made to complete the recovery in a timely manner. It is important to keep in mind that some fossil specimens (e.g., a large mammal skeleton) may require an extended salvage period. Because of the potential for the recovery of a small fossil remains (e.g., isolated teeth of small vertebrates), it may be necessary to collect bulk-matrix samples for screen washing or to set up an onsite screen washing station.

**MM GEO-4:** In the event that fossils are discovered during a period when a paleontological monitor is not on site (i.e., inadvertent discovery), earthwork within the vicinity of the discovery site shall temporarily halt, and the Project Paleontologist contacted to evaluate the significance of the discovery. If the inadvertent discovery is determined to be significant, the fossils shall be recovered, as outlined in MM GEO-4.

**MM GEO-5:** Fossil remains collected during monitoring and salvage should be cleaned, repaired, sorted, taxonomically identified, and cataloged as part of the mitigation program. Fossil preparation may also include screen-washing of bulk matrix samples for microfossils or other laboratory analyses (e.g., radiometric carbon dating,) if applicable. Fossil preparation and curation activities may be conducted at the laboratory of the contracted Project Paleontologist, at an appropriate outside agency, and/or at the designated repository, and shall follow the standards of the designated repository.

**MM GEO-6:** Prepared fossils, along with copies of all pertinent field notes, photos, and maps, should be housed in an established, accredited museum repository with permanent, retrievable paleontological storage (e.g., University of California Museum of Paleontology, San Diego Natural History Museum). These procedures are essential steps in effective paleontological mitigation and CEQA compliance. The Project Paleontologist must have a writer repository agreement in hand prior to the initiation of mitigation activities. Mitigation



of adverse impacts to significant paleontological resources is not complete until such curation into an established, accredited museum repository has been fully completed and documented.

**MM GEO-7:** A final summary report should be completed that outlines the results of the mitigation program. The report and inventory, when submitted to the appropriate Lead Agency, along with confirmation of the curation of recovered specimens into an established, accredited museum repository, will signify completion of the program to minimize impacts to paleontological resources. A copy of the paleontological monitoring report should be submitted to the Lead Agency and to the designated museum repository.

**LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact with mitigation incorporated*.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than- Significant Impact	No Impact
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### 3.4.8 - GREENHOUSE GAS EMISSIONS

Would the Project:

- |  |                          |                          |                                     |                          |
|--|--------------------------|--------------------------|-------------------------------------|--------------------------|
| a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?        | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b. Conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Discussion

An air quality and greenhouse gas assessment report was relied upon in the analysis of impacts related to greenhouse gases (GHGs) (see Appendix C). This report was prepared in accordance with the SJVAPCDs guidelines and adopted policies of CARB.

In addition to providing an assessment of the Project's impacts to GHGs, the report includes a detailed description of the regulatory environment as it relates to GHGs.

GHGs are identified as any gas that absorbs infrared radiation in the atmosphere. GHGs include water vapor, carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), halogenated fluorocarbons (HCFCs), ozone (O<sub>3</sub>), perfluorinated carbons (PFCs), hydrofluorocarbons (HFCs), and sulfur hexafluoride (SF<sub>6</sub>). On December 7, 2009, the EPA issued an Endangerment Finding on the above referenced key well-mixed GHGs. These GHGs are considered "pollutants" under the Endangerment Finding. However, these findings do not themselves impose any requirements on industry or other entities.

The Global Warming Solutions Act [Assembly Bill (AB) 32] was passed by the California Legislature and signed into law by the Governor in 2006. AB 32 requires that GHGs emissions in 2020 be reduced to 1990 levels. GHGs rules and market mechanisms for emissions reduction were required to be in place as of January 2012.

**Impact #3.4.8a – Would the Project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?**

In the event that a local air district's guidance for addressing GHG impacts does not use numerical GHG emissions thresholds, at the lead agency's discretion, a neighboring air district's GHG thresholds may be used to determine impacts. On December 5, 2008, the South Coast Air Quality Management District (SCAQMD) Governing Board adopted the staff proposal for an interim GHG significance threshold for projects where the SCAQMD is lead

agency. The SCAQMD guidance identifies a threshold of 10,000 MTCO<sub>2</sub>eq./year for GHG for construction emissions amortized over a 30-year project lifetime, plus annual operation emissions. This threshold is often used by agencies, such as the California Public Utilities Commission, to evaluate GHG impacts in areas 45 Fairmead Wastewater System Improvements Project Air Quality & Greenhouse Gas Impact Assessment that do not have specific thresholds (CPUC 2015). Therefore, because this threshold has been established by the SCAQMD in an effort to control GHG emissions in the largest metropolitan area in the State of California, this threshold is considered a conservative approach for evaluating the significance of GHG emissions in a more rural area, such as Madera County. Though the Project is under SJVAPCD jurisdiction, the SCAQMD GHG threshold provides some perspective on the GHG emissions generated by the Project. The Project will not generate operational emissions as noted above. However, in accordance with SCAQMD guidance, the Project's construction emissions were amortized over 30-years and compared to the 10,000 MTCO<sub>2</sub>eq./year criteria. Table 7 of the Air Quality & Greenhouse Gas Impact Assessment (see Appendix A) shows GHG emissions associated with the construction phase of the Project. Construction emissions associated with the Project amortized over 30-years equates to 16.08 MTCO<sub>2</sub>eq, which is approximately 99.8 percent less than the threshold identified by the SCAQMD.

Based on the assessment above, the Project will not generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment. Therefore, any impacts would be less than significant.

#### **MITIGATION MEASURE(S)**

No mitigation is required.

#### **LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact*.

#### **Impact #3.4.8b – Would the Project conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?**

As noted previously, California passed the California Global Warming Solutions Act of 2006. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. Under AB 32, CARB must adopt regulations by January 1, 2011 to achieve reductions in GHGs to meet the 1990 emission cap by 2020. On December 11, 2008, CARB adopted its initial Scoping Plan, which functions as a roadmap of CARB's plans to achieve GHG reductions in California required by AB 32 through subsequently enacted regulations. CARB's 2017 Climate Change Scoping Plan builds on the efforts and plans encompassed in the initial Scoping Plan.

SB 375 requires MPOs to adopt a SCS or APS that will prescribe land use allocation in that MPO's regional transportation plan. CARB, in consultation with MPOs, has provided each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. For the MCTC region, CARB set targets at five

percent per capita decrease in 2020 and a 10 percent per capita decrease in 2035 from a base year of 2005. MCTC's 2018 RTP/SCS, which was adopted in July 2018, projects that the Madera County region would achieve the prescribed emissions targets. Executive Order B-30-15 establishes a California greenhouse gas reduction target of 40 percent below 1990 levels by 2030 to ensure California meets its target of reducing greenhouse gas emissions to 80 percent below 1990 levels by 2050. Executive Order B-30-15 requires MPO's to implement measures that will achieve reductions of greenhouse gas emissions to meet the 2030 and 2050 greenhouse gas emissions reductions targets.

As required by California law, city and county General Plans contain a Land Use Element that details the types and quantities of land uses that the city or county estimates will be needed for future growth, and that designate locations for land uses to regulate growth. MCTC uses the growth projections and land use information in adopted general plans to estimate future average daily trips and then VMT, which are then provided to SJVAPCD to estimate future emissions in the AQPs. The applicable General Plan for the project is the Madera County and City of Chowchilla General Plans, which were adopted in 1995 and 2011, respectively.

The Project is consistent with the currently adopted General Plan for Madera County and the City of Chowchilla and the adopted 2018 RTP/SCS and is therefore consistent with the population growth and VMT applied in those plan documents. Therefore, the Project is consistent with the growth assumptions used in the applicable AQP. It should also be noted that yearly GHG emissions generated by the Project are approximately 99.8 percent less than the threshold identified by the SCAQMD (see the discussion for Impact 3.4.8a above).

Based on the assessment above, the Project will not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases. The Project further the achievement of the County's greenhouse gas reduction goals. Therefore, any impacts would be less than significant.

#### **MITIGATION MEASURE(S)**

No mitigation is required.

#### **LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact*.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than- Significant Impact	No Impact
<b>3.4.9 - HAZARDS AND HAZARDOUS MATERIALS</b>				
Would the Project:				
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Be located on a site that 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

***Discussion*****Impact #3.4.9a – Would the Project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?**

The building and operation of a sewer line system would involve minimal transport, use, and storage of hazardous materials. Construction of the Project would involve the transport and use of minor quantities of hazardous materials, such materials would be limited to fuels, oils, lubricants, hydraulic fluids, paints and solvents utilized at the Project site for construction purposes.

The presence and use of these materials, which can be classified as hazardous materials, create the potential for accidental spillage and exposure of workers to these substances. Hazardous and non-hazardous wastes would likely be transported to and from the Project site during the construction phase of the proposed Project. Construction would involve the use of some hazardous materials, such as diesel fuel, hydraulic oil, grease, solvents, adhesives, paints, and other petroleum-based products, although these materials are commonly used during construction activities and would not be disposed of on the Project site. In addition, sanitary waste generated during construction would be managed by means of portable toilets, which would be located at reasonably accessible onsite locations.

No known historic oil activity has occurred on the site. The Project is not located within the boundaries of an oilfield. According to the California Geologic Energy Management Division (Cal GEM) records and maps, no abandoned oil wells are located on the site (see Figure 3.4.9-1) (California Department of Conservation, 2019).

In order to best prevent impacts to the environment due to spillage of hazardous materials, the developer shall develop a Spill Prevention and Contingency Plan. The Project will have a less-than-significant impact with mitigation incorporated.

***MITIGATION MEASURE(S)***

**MM HAZ-1:** Avoid/Minimize Potential Impacts from Construction Material Release. Prior to construction, the contractor shall develop a Spill Prevention and Contingency Plan for the proposed Project that at a minimum includes the following:

- Containment and cleanup equipment (e.g., absorbent pads, mats, socks, granules, drip pans, shovels, and lined clean drums) shall be at the staging areas and construction site for use, as needed.
- Staging areas where refueling, storage, and maintenance of equipment occur shall not be located within 100 feet of drainages to reduce the potential for contamination by spills.
- Construction equipment shall be maintained and kept in good operating condition to reduce the likelihood of line breaks or leakage.
- No refueling or servicing shall be done without absorbent material (e.g., absorbent pads, mats, socks, pillows, and granules) or drip pans underneath to contain spilled



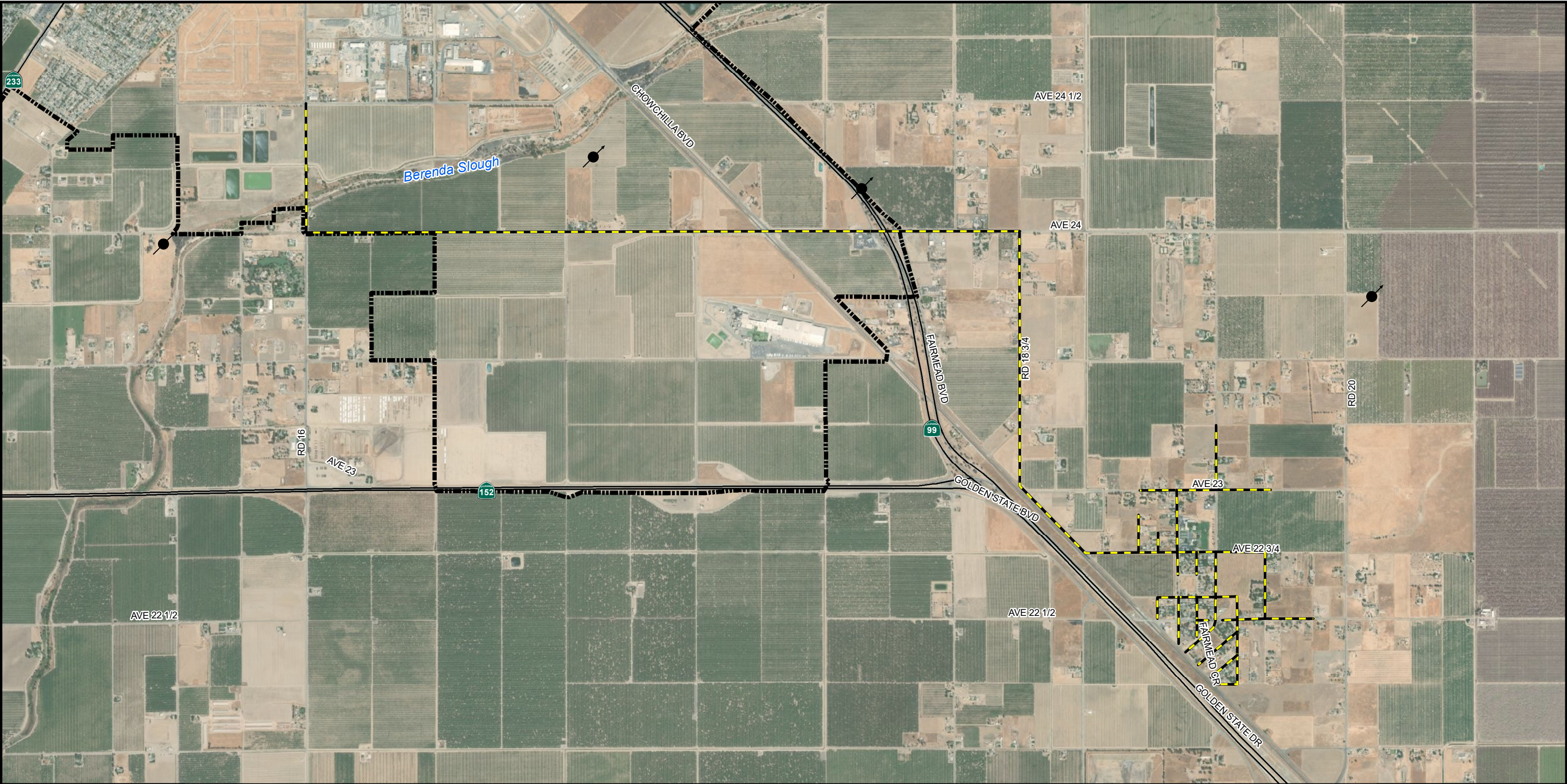
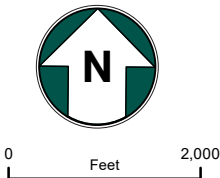


Figure 3.4.9-1 CalGEM Oil and Gas Wells

● Plugged Well     Project Site     Chowchilla City Limit





- material. If these activities result in an accumulation of materials on the soil, the soil shall be removed and properly disposed of as hazardous waste.
- If a spill is detected, construction activity shall cease immediately, and the procedures described in the Spill Prevention and Contingency Plan will be immediately enacted to safely contain and remove spilled materials.
- Spill areas shall be restored to pre-spill conditions, as practicable.
- Spills shall be documented and reported to Madera County and appropriate resource agency personnel.

**LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact with mitigation incorporated*.

**Impact #3.4.9b – Would the Project 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?**

Implementation of the Project contains risk of conditions that could potentially release hazardous materials into the environment. All construction crew shall transport, store, handle, and dispose of construction-related hazardous materials consistent with relevant regulations and guidelines, including those recommended and enforced by Caltrans; the Central Valley RWQCB; Madera County Community and Economic Development Department and Madera County Environmental Health Division standards. It is also standard County practice to review site plans for all development proposals on a case-by-case basis, which further minimizes the potential for public exposure to hazardous materials. Implementation of the discussed management practices would result in a less-than-significant impact.

**MITIGATION MEASURE(S)**

No mitigation is required.

**LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact*.

**Impact #3.4.9c – Would the Project emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?**

The Project area contains one school: Fairmead Elementary School. The school will replace its septic tank with a connection to the new wastewater collection system. The installation of the wastewater collection system will eliminate the risk of groundwater contamination from the septic tanks. The amount of hazardous emissions from the Project is less than significant, and all hazardous materials would be handled in accordance with applicable regulations during construction and operation of the proposed Project. Therefore, the impact is less than significant.



**MITIGATION MEASURE(S)**

No mitigation is required.

**LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact*.

**Impact #3.4.9d – Would the Project be located on a site that 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?**

An online search was conducted of the California Environmental Protection Agency (CAL EPA) website (Cal EPA, n.d.) for Cortese Act locations on or near the Project site. The Department of Toxic Substances Control (DTSC) website, indicated that there are no hazardous or toxic sites in the vicinity (within one mile) of the Project site; the closest hazardous waste and substances site is almost 19 miles south of the Project area in the unincorporated Community of Trigo (Department of Toxic Substances Control, 2015).

The Project is not located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and would not create a significant hazard to the public or the environment. The Project site is not within the immediate vicinity of a hazardous materials site and would not impact a listed site. Literature review of available federal, State, and local database information systems was performed for the purpose of identifying known recognized environmental conditions present on the site and the nearby properties that have the potential to adversely impact the site. There is no data identifying any facilities within 0.25 miles of the site that might reasonably be anticipated to emit hazardous air emissions or handle hazardous materials, substances, or wastes that might affect the Project site. Therefore, the Project would have no impact.

**MITIGATION MEASURE(S)**

No mitigation is required.

**LEVEL OF SIGNIFICANCE**

The Project would have *no impact*.

**Impact #3.4.9e – Would the Project 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?**

The Project area extends from the Community of Fairmead to the Chowchilla WWTF. Although Fairmead does not have an airport located within two miles of it, the Project as it is constructed and approaches the WWTF comes to be within two miles of the Chowchilla Municipal Airport. As the Project approaches the WWTF through Avenue 24, it crosses into

territory designated Area D, “Other Airport Environs,” of the Madera Countywide Airport Land Use Compatibility Plan. However, this zone has been distinguished as having a low risk level as well as a low noise impact (Madera County, 2015). Therefore, the impact is less than significant.

**MITIGATION MEASURE(S)**

No mitigation is required.

**LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact*.

**Impact #3.4.9f – Would the Project impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan?**

The proposed Project will require earth moving activities in order to abandon the septic tanks and leach fields in Fairmead and direct wastewater flows through a new sewer trunk line. Although this may result in open trenches in front of homes and businesses, construction work will be staged to allow emergency vehicles to have access to all homes. The construction team will back fill trench as they go along or will use steel plates to allow the houses to be accessible during construction. However, an encroachment permit will be required for work in the County’s right of way. With the approval of the encroachment permit, the Project will have a less-than-significant impact on emergency response plans or emergency evacuation plans.

**MITIGATION MEASURE(S)**

**MM HAZ-2:** An encroachment permit, approved by the County Department of Public Works, will be required to cut trenches in the County’s right of way. As a part of the encroachment permit, a traffic control plan will be submitted to the County Public Works Department.

**LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact with mitigation incorporated*.

**Impact #3.4.9g – Would the Project expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?**

The proposed Project is surrounded by a mix of urban, agricultural, and residential land uses but would not expose people or structures to a significant risk of loss, injury, or death involving wildland fires as there are no wildlands in the vicinity. According to Cal Fire’s Fire Hazard Severity Zones Maps, the Project site is not located within a hazard zone classified as Very High, High or Moderate for wildland fires (Cal Fire, 2007). Construction and operation of the Project is not expected to increase the risk of wildfires on and adjacent to the Project site. The Project will also be required to comply with all applicable standards as required by the Merced County Fire Department.

The proposed Project would not expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands. Therefore, the Project would have a no impact.

***MITIGATION MEASURE(S)***

No mitigation is required.

***LEVEL OF SIGNIFICANCE***

The Project would have *no impact*.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than- Significant Impact	No Impact
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### 3.4.10 - HYDROLOGY AND WATER QUALITY

Would the Project:

a.	Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b.	Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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 offsite;	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ii.	Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or offsite;	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iv.	Impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d.	In flood hazard, tsunami, or seiche zones, risk release of pollutants due to Project inundation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e.	Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

***Discussion*****Impact #3.4.10a – Would the Project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?**

The proposed project would abandon the septic tanks and leach fields in Fairmead and direct wastewater flows through a new sewer trunk line to the City of Chowchilla's Wastewater Treatment Facility (WWTF). Approximately 175 residential connections, the Fairmead Elementary School, and a commercial property will be connected to the City of Chowchilla's WWTF. The proposed Project includes a collection system, pump station, force main and gravity main with wastewater treatment and disposal at the existing City of Chowchilla WWTF.

The following is a summary of the potential for impacts during construction and operation of the proposed project.

***Construction***

There is a potential for pollutants to enter the Middle San Joaquin-Lower Chowchilla Watershed during project construction. Activities related to the construction of the proposed Project would create the potential for soil erosion and possibly increase sedimentation, both onsite and downstream of the proposed Project site. Construction activities also increase the potential for accidental release of pollutants that could affect surface waters. Such pollutants include oil and gas from machinery, chemicals associated with construction, and waste material. Many construction-related pollutants have the potential to degrade water quality by increasing constituent levels in surface waters and could lead to an exceedance of water quality standards. Proposed construction activities could violate these standards if mitigation measures are not implemented and could cause harm to surrounding habitats and their associated plant and animal life. Construction would require special consideration to prevent significant impacts to the surface waters, especially in the vicinity of Berenda Slough and the three canals crossed by the proposed Project force main.

Grading, excavation, and the removal of vegetation during construction could expose site soils to rain, sheet-flows, and potential erosion prior to successful revegetation or completion of improvements. The potential for erosion hazards within the Project site is low, as most of the Project area is flat and has very little topographic relief; however, sections of the Project may exist in areas with sloping topography (i.e. Berenda Slough and local irrigation ditches) which create the potential for erosion to occur. Rainfall and associated stormwater runoff could result in periods of sheet erosion within areas of exposed or stockpiled soils. If uncontrolled, these soil materials could cause sedimentation and blockage of drainage channels. Further, the compaction of soils by heavy equipment may reduce the infiltration capacity of soils and increase the potential for runoff and erosion. Stormwater runoff could also wash construction materials into receiving water bodies that discharge outside of the Project site and negatively affect ground water quality. Non-stormwater discharges could result from activities such as construction dewatering procedures,

discharge or accidental spills of hazardous substances such as fuels, oils, concrete, paints, solvents, cleaners, or other construction materials.

Because implementation of the proposed Project could result in the introduction of sediment and other nonpoint source pollutants into onsite drainage channels and ultimately offsite drainage channels as a result of temporary construction activities, short-term, construction related water quality degradation would be considered a significant impact. The General Permit for Stormwater Discharges Associated with Construction Activity (General Permit) adopted by the State Water Resources Control Board will be obtained prior to construction as detailed in Mitigation Measure HYD-1. The General Permit requires Madera County and/or contractor to develop and implement a Stormwater Pollution Prevention Plan (SWPPP). This plan must specify BMPs that would prevent all construction pollutants from contacting stormwater, with the intent of keeping all products of erosion from moving off site into receiving waters. The permit also requires elimination or reduction of non-stormwater runoff. The Project will adhere to the conditions of the General Permit, SWPPP, BMPs, and Mitigation Measure HYD-1-Prepare an Erosion Control and SWPPP, therefore, there would be a less-than-significant impact to surface or ground water quality standards or waste discharge requirements.

### ***Operation***

Long-term operation of the site would not adversely affect water quality or lead to violation of water quality standards. The Chowchilla WWTF is covered under Regional Board Order #90-271 for their Waste Discharge Requirement (WDR), and the proposed Project would adhere to the WDR. The increased treatment at the current WWTF would not exceed the current limits of the existing permits.

Additionally, in accordance with California well standards, all proposed Project components shall be placed outside the specified minimum horizontal separation distance between wells and sewer lines of 50 feet (CDWR, 2019). By placing the Project components outside of the minimum horizontal separation distance, it will ensure that no public or personal potable water wells would be contaminated by the Project. The potential for operational activities to violate any water quality standards or waste discharge requirements or otherwise degrade water quality is considered less than significant.

### ***MITIGATION MEASURE(S)***

**MM HYD-1:** Implement Sedimentation and Erosion Control Measures, which includes drainage control and the installation and implementation of Best Management Practices (BMPs), including straw bales, coir rolls, hydro seeding, etc., in areas of bare soil, and in drainages near all areas of disturbance during construction of the proposed Project and would therefore reduce potential impacts to less than significant. BMPs for control of erosion are required as part of Madera County's grading and building permits to reduce erosion of soils on the proposed Project site. The requirements of the State General Construction Stormwater Permit will require a Stormwater Pollution Prevention Program (SWPPP) because area of impact would be greater than one acre. With the incorporation of Mitigation

Measure HYD-1, potential erosion and sedimentation impacts are considered less than significant.

**LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact with mitigation incorporated*.

**Impact #3.4.10b – Would the Project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin?**

The Project site is in the San Joaquin Valley Basin within the Chowchilla Subbasin. Chowchilla Water District GSA.

**Construction**

Use of water in the construction phase of the project would largely come from dust control. With two to three 10,000 gallon trucks being used per day for the six months of the construction period where dust control is required this would result in approximately 5.4 million gallons of water being used in total. This total does not account for rain or winter conditions, so the total amount of water used could be less than previously proposed. Although some water will be lost to evaporation, most of the water would return to being groundwater. Thus, construction related impacts to groundwater resources would be considered less than significant.

**Operation**

No new wells that could place additional water supply demands on the local aquifer are proposed as part of the Project. It is expected that water demands needed to operate the increased inflow to the existing WWTF would be similar to existing conditions and would not place additional stress on the local groundwater table.

The Project would result in a maximum increase of 0.1 acres (4,356 sf) of impervious surface area (i.e., new structures and asphalt walkways) beyond existing conditions. Newly constructed facilities (i.e., access roads and pump station) would not result in an increase impervious surface area. Consequently, the proposed Project is not expected to substantially interfere with local groundwater recharge. Considering these Project characteristics, impacts to groundwater resources are considered less than significant.

**MITIGATION MEASURE(S)**

No mitigation is required.

**LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact*.

**Impact #3.4.10c(i) – Would the Project 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 result in substantial erosion or siltation on or offsite?**

***Construction and Operation***

Construction of the proposed Project would involve grading, trenching, and other earth movement that would result in soil disturbance that could temporarily alter minor drainage patterns and increase hazard of erosion and sedimentation. The proposed Project would not significantly increase impervious areas or generate increased stormwater flows. Implementation of Mitigation Measure HYD-1-Prepare an Erosion Control and SWPPP would minimize the potential for the proposed Project to substantially alter the existing drainage pattern of the site or area, reducing impacts to a less than significant with mitigation incorporated.

***MITIGATION MEASURE(S)***

Implementation of Mitigation Measure MM HYD-1.

***LEVEL OF SIGNIFICANCE***

The Project would have a *less-than-significant impact with mitigation incorporated*.

**Impact #3.4.10c(ii) – Would the Project 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 substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or offsite?**

***Construction and Operation***

Project construction could temporarily alter drainage patterns during trenching activities; however, all disturbed areas will be restored to pre-existing conditions to the extent feasible.

Mitigation Measure HYD-1 would minimize the potential to alter the existing drainage pattern while soils are exposed during trenching and grading. Therefore, construction related Project impacts would be considered less than significant with mitigation incorporated.

***MITIGATION MEASURE(S)***

Implementation of Mitigation Measure MM HYD-1.

***LEVEL OF SIGNIFICANCE***

The Project would have a *less-than-significant impact with mitigation incorporated*.



**Impact #3.4.10c(iii) – Would the Project 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 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?**

***Construction and Operation***

The proposed Project could provide substantial additional sources of polluted runoff during construction in the event of an unexpected spill. Implementation of best management practices and Mitigation Measure HAZ-1 for spill prevention and containment will be implemented to minimize the potential for polluted runoff due to the Project, reducing impacts to less than significant with mitigation incorporated.

***MITIGATION MEASURE(S)***

Implementation of Mitigation Measure MM HAZ-1.

***LEVEL OF SIGNIFICANCE***

The Project would have a *less-than-significant impact with mitigation incorporated*.

**Impact #3.4.10c(iv) – Would the Project 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 impede or redirect flood flows?**

***Construction and Operation***

According to the FEMA FIRM Map Panel 0900E, portions of the Project area (the southeast portion of the Fairmead collection system) lie within a 100-year floodplain (see Figure 3.4.10-1). However, the planned construction in this area consists of underground sewer pipelines and would not have any effect on flood flows. The Project would result in a maximum increase of 0.1 acres (4,356 sf) of impervious surface area (i.e., new structures and asphalt walkways) beyond existing conditions. Newly constructed facilities (i.e., access roads and pump station) would not result in an increase impervious surface area. Therefore, the potential for the Project to impact flood flows are considered less than significant.

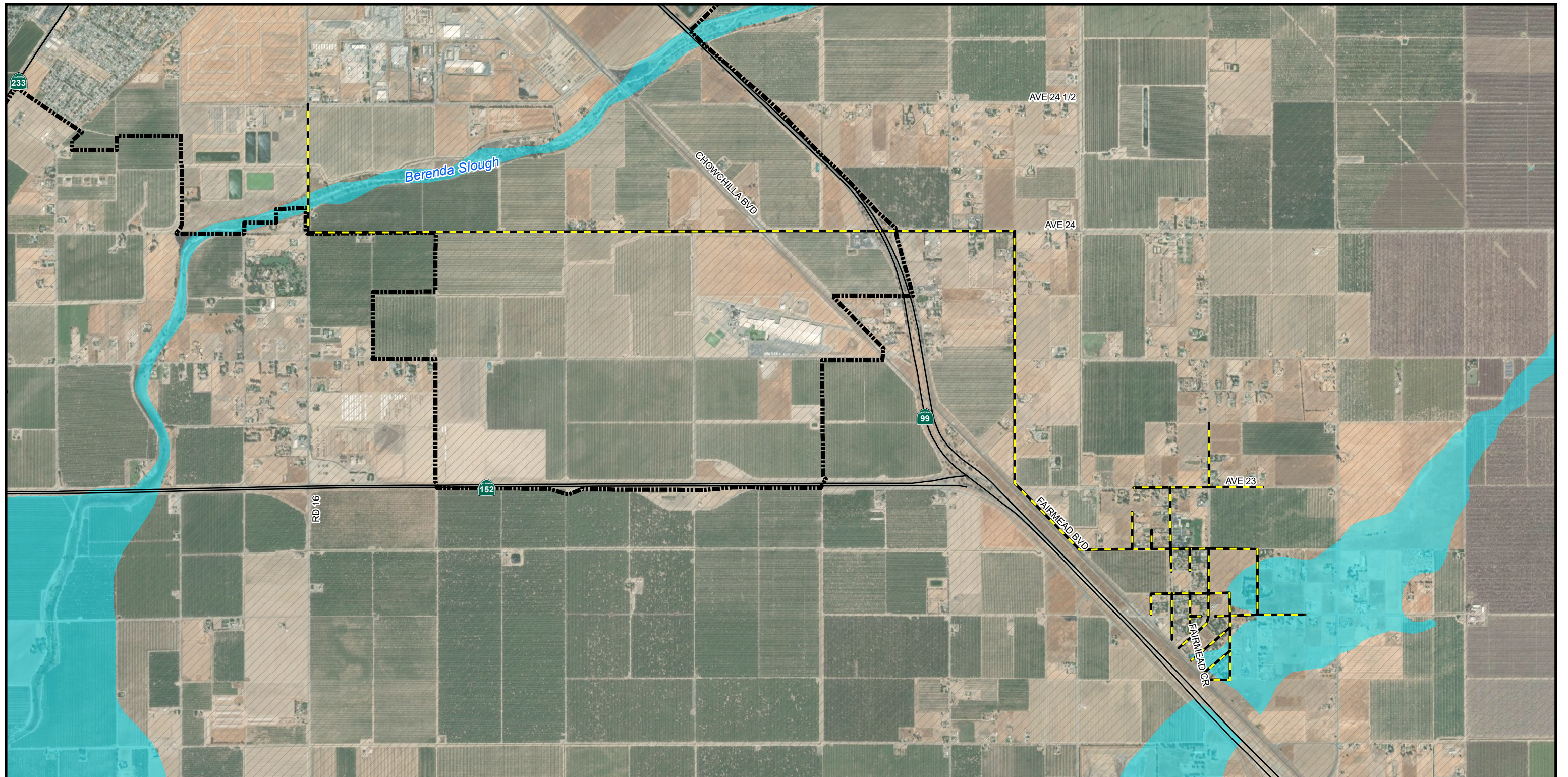
***MITIGATION MEASURE(S)***

No mitigation is required.

***LEVEL OF SIGNIFICANCE***

The Project would have a *less-than-significant impact*.



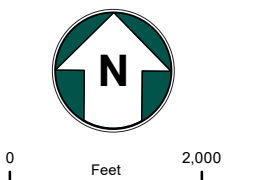


**Figure 3.4.10-1 FEMA Flood Hazard Zones**



1% Annual Chance Flood Hazard  
 Area of Minimal Flood Hazard

Project Site  
 Chowchilla City Limit





**Impact #3.4.10d – Would the Project in flood hazard, tsunami, or seiche zones, risk release of pollutants due to Project inundation?****Construction and Operation**

The proposed Project's inland location makes the risk of tsunami highly unlikely. The probability of a seiche occurring in Madera County is considered negligible. Furthermore,

given the geologic context at the proposed Project site, if such an event were to occur, the likelihood of it exposing Project structures or people to a significant risk is considered low. The portions of the Project area (the southeast portion of the Fairmead collection system) that lie within a 100-year floodplain consists of underground sewer pipelines and would not be affected by flood hazards. Finally, the Chowchilla WWTF is covered under Regional Board Order #90-271 for their Waste Discharge Requirement (WDR), and the proposed Project would adhere to the WDR, and would not be at risk of releasing pollutants. Therefore, the risk of flood hazard, tsunami, or seiche zones, or release of pollutants is considered less than significant.

**MITIGATION MEASURE(S)**

No mitigation is required.

**LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact*.

**Impact #3.4.10e – Would the Project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?**

The Project site is in the San Joaquin Valley Basin within the Chowchilla Subbasin. Chowchilla Water District GSA. The General Permit for Stormwater Discharges Associated with Construction Activity (General Permit) adopted by the State Water Resources Control Board will be obtained prior to construction as detailed in Mitigation Measure HYD-1. The General Permit requires Madera County and/or contractor to develop and implement a Stormwater Pollution Prevention Plan (SWPPP). This plan must specify BMPs that would prevent all construction pollutants from contacting stormwater, with the intent of keeping all products of erosion from moving off site into receiving waters. The permit also requires elimination or reduction of non-stormwater runoff. The Project will adhere to the conditions of the General Permit, SWPPP, BMPs, and Mitigation Measure HYD-1, Prepare an Erosion Control and SWPPP, therefore, there would be a less-than-significant impact to surface or ground water quality. Therefore, the project will not conflict with a water quality control plan or sustainable groundwater management plan.

**MITIGATION MEASURE(S)**

Implementation of MM HYD-1.

**LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact with mitigation incorporated*.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than- Significant Impact	No Impact
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### 3.4.11 - LAND USE AND PLANNING

Would the Project:

- |    |  |                          |                          |                          |                                     |
|----|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a. | Physically divide an established community?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

### Discussion

#### Impact #3.4.11a – Would the Project physically divide an established community?

The Project would be constructed within existing roadways from Fairmead to Chowchilla. Since the proposed Project is not physically dividing the Community, there will be no impact.

#### MITIGATION MEASURE(S)

No mitigation is required.

#### LEVEL OF SIGNIFICANCE

The Project would have *no impact*.

#### Impact #3.4.11b – Would the Project 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?

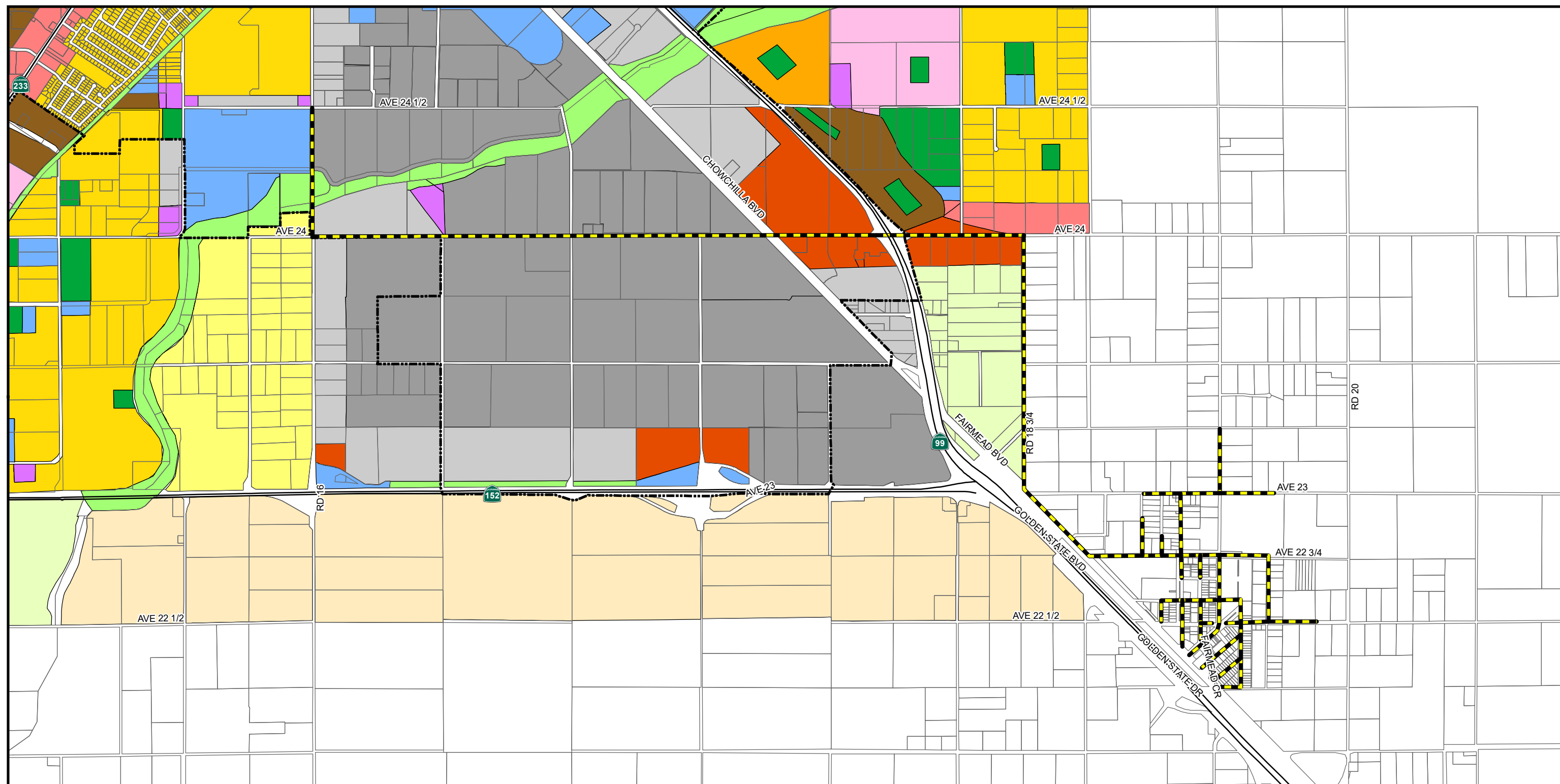
The surrounding land uses of the Project include Residential, Community Commercial, Public Facility, and Heavy Industrial (see Figures 3.4.11-1, 3.4.11-2, 3.4.11-3, and 3.4.11-4). Given the nature of the Project, it would not conflict with any applicable land use plan, policy, or regulation of agency with jurisdiction over the Project adopted for the purpose of avoiding or mitigating an environmental effect. Therefore, the Project would have no impact.

#### MITIGATION MEASURE(S)

No mitigation is required.

***LEVEL OF SIGNIFICANCE***

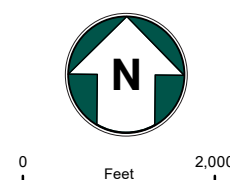
The Project would have *no impact*

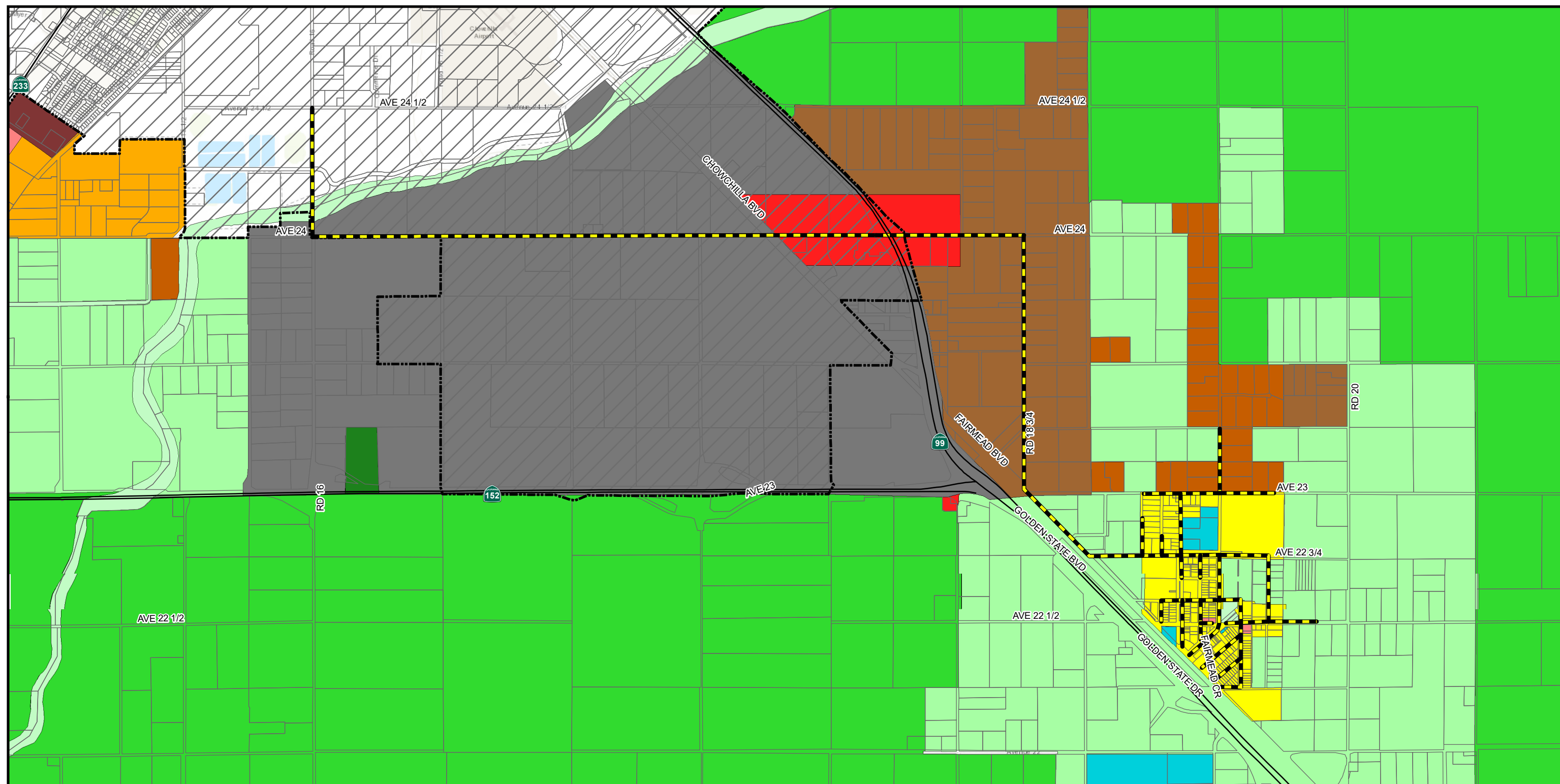


**Figure 3.4.11-1 City of Chowchilla General Plan Land Use**



- |  |                                   |                       |                      |                       |
|--|-----------------------------------|-----------------------|----------------------|-----------------------|
| LDR - Low Density Residential          | MU - Mixed Use                    | LI - Light Industrial | P - Park             | Land Parcel           |
| MDR - Medium Density Residential       | NC - Neighborhood Commercial      | HI - Heavy Industrial | CP - Community Park  | Chowchilla City Limit |
| MHDR - Medium High Density Residential | SC - Service Commercial           | AG - Agriculture      | PF - Public Facility | Project Site          |
| HDR - High Density Residential         | SC-H - Service Commercial Highway | OS - Open Space       | UR - Urban Reserve   |                       |

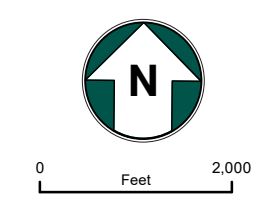




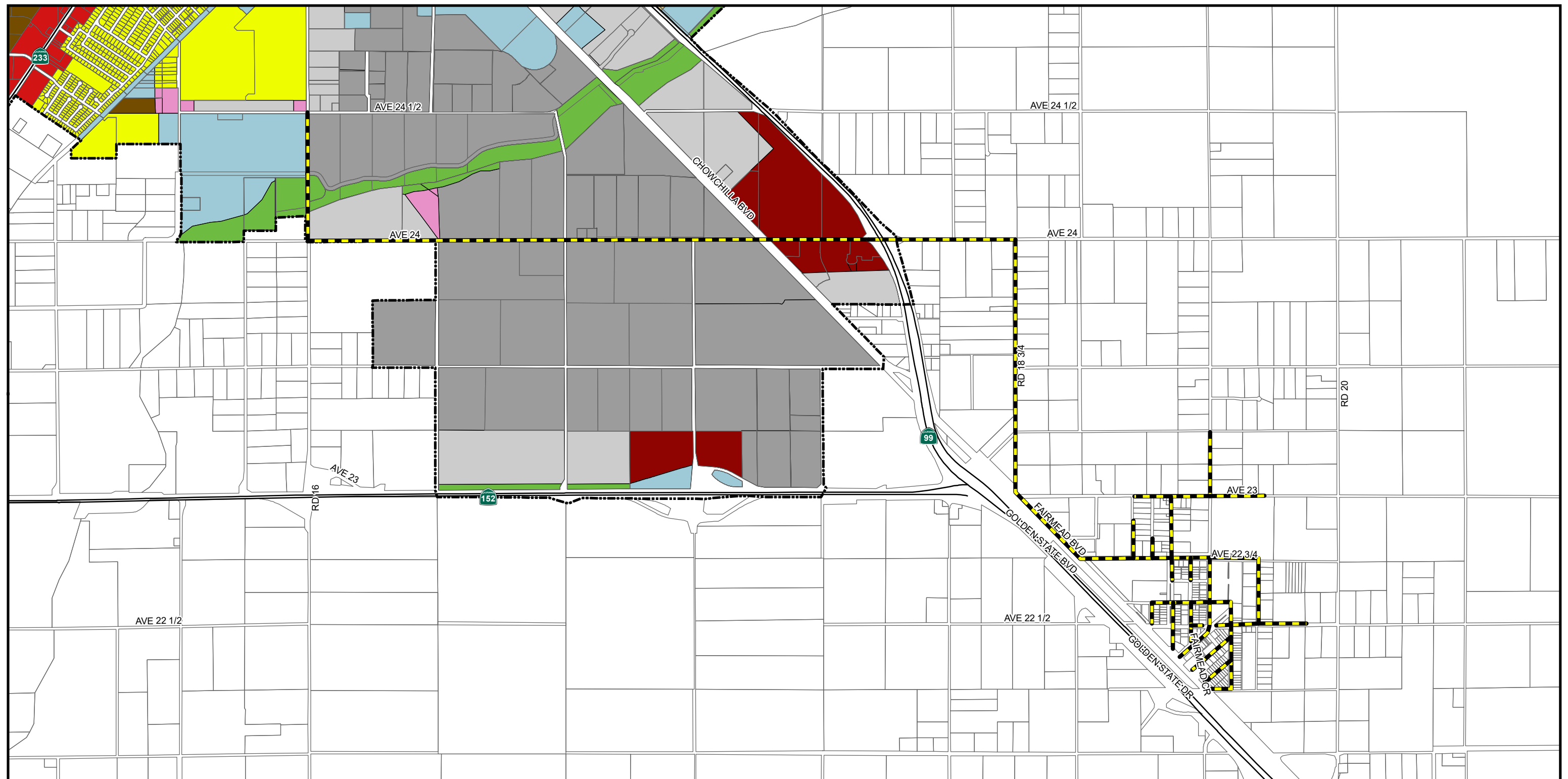
**Figure 3.4.11-2 Madera County General Plan Land Use**



- |                                |                                  |                                |                       |
|--------------------------------|----------------------------------|--------------------------------|-----------------------|
| A - Agriculture                | HI - Heavy Industrial            | PI - Public Institutional      | Land Parcel           |
| AE - Agriculture Exclusive     | HSC - Highway Service Commercial | RER - Rural Estate Residential | Chowchilla City Limit |
| AR - Agriculture Residential   | LDR - Low Density Residential    | RR - Rural Residential         | Project Site          |
| CC - Community Commercial      | MDR - Medium Density Residential |                                |                       |
| HDR - High Density Residential | OS - Open Space                  |                                |                       |

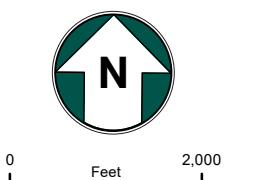


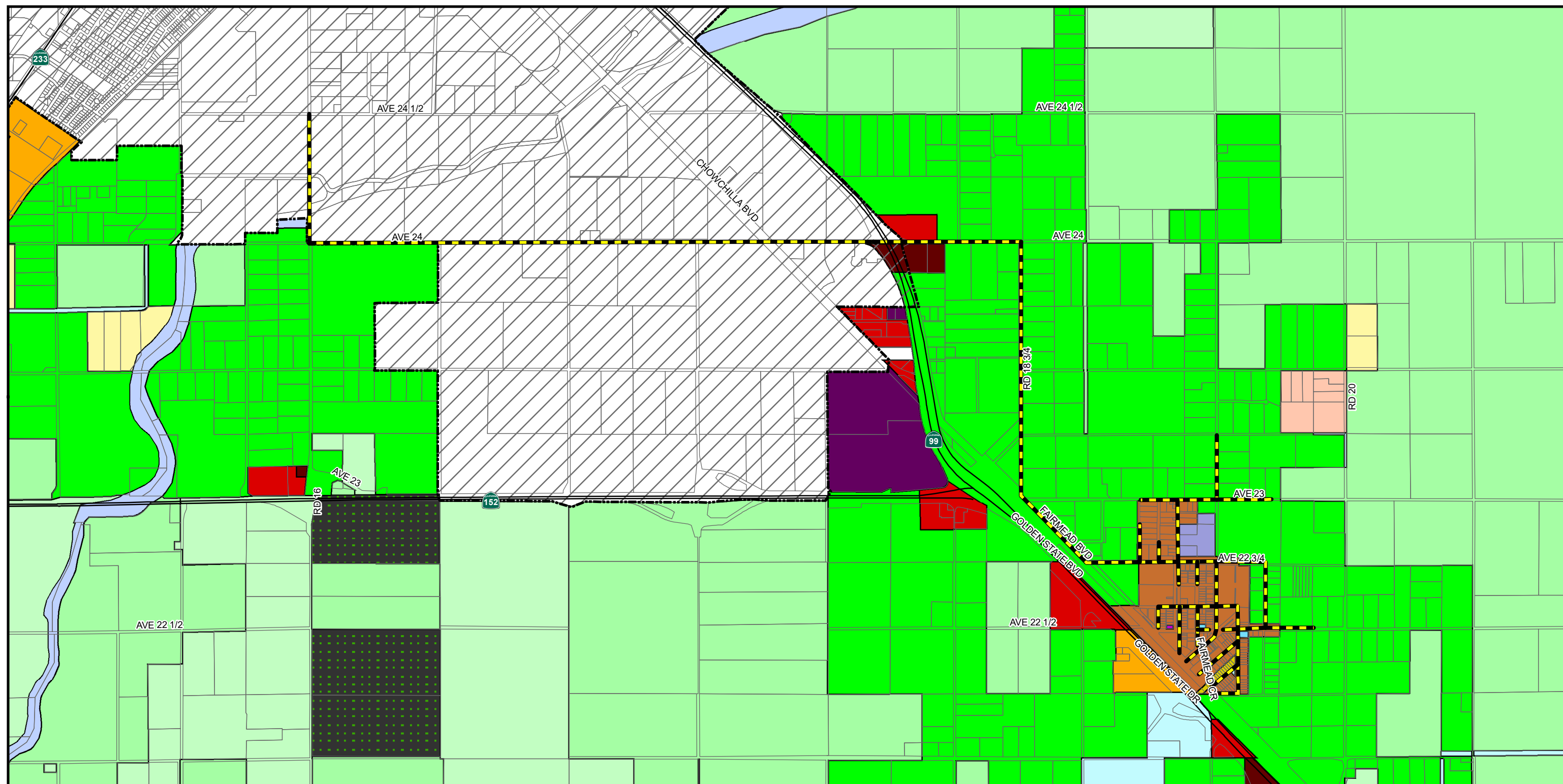




**Figure 3.4.11-3 City of Chowchilla Zoning**

- |  |                          |                      |                       |
|--|--------------------------|----------------------|-----------------------|
| R-M-5 - Medium Density Residential 5k sq.ft. min. lots | C-S - Service Commercial | PF - Public Facility | Chowchilla City Limit |
| R-M-6 - Medium Density Residential 6k sq.ft. min. lots | C-H - Highway Commercial | OS - Open Space      | Project Site          |
| R-H - High Density Residential                         | I-L - Light Industrial   | Land Parcel          |                       |
| C-N - Neighborhood Commercial                          | I-H - Heavy Industrial   |                      |                       |





**Figure 3.4.11-4 Madera County Zoning**

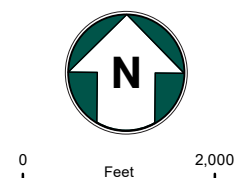


- AEX-20 - Agriculture Exclusive (20 Acres)
- AR-5 - Agriculture, Rural (Five Acre) District
- ARE-20 - Agriculture, Rural, Exclusive (20 Acre) District
- ARE-40 - - Agriculture, Rural, Exclusive (40 Acre) District
- CRG - Commercial, Rural, General District
- CRH - Commercial, Rural, Highway District

- CRM - Commercial, Rural, Median District
- CUM - Commercial, Urban, Median District
- IA - Institution Area District
- IH - Industrial, Urban or Rural, Heavy District
- OS - Open Space
- PDD - Planned Development District

- POS - Public Open Space
- RRS - Residential, Rural, Single Family District
- RRS-10 - Residential, Rural, Single Family (10 Acre) District
- RRS-2 - Residential, Rural, Single Family (2 Acre) District
- RUM - Residential, Urban, Multiple Family District
- RUS - Residential Urban, Single Family District

- Land Parcel
- Chowchilla City Limit
- Project Site



	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than- Significant Impact	No Impact
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### 3.4.12 - MINERAL RESOURCES

Would the Project:

- |    |   |                          |                          |                          |                                     |
|----|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a. | Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State?                                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b. | Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

### Discussion

**Impact #3.4.12a – 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?**

According to the City of Chowchilla General Plan Open Space and Conservation Element, the 2040 General Plan Planning Area and the City of Chowchilla Sphere of Influence Area are designated as MRZ-1, defined as “areas where adequate information indicates that no significant mineral deposits are present or where it is judged that little likelihood exists for their presence” (City of Chowchilla, 2011). No current mineral extraction activities exist on the Project site nor are any mineral extraction activities included in the Project design. The proposed Project would not 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. Therefore, there would be no impact.

### MITIGATION MEASURE(S)

No mitigation is required.

### LEVEL OF SIGNIFICANCE

The Project would have *no impact*.

**Impact #3.4.12b – 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?**

See Impact #3.4.12a, above.

***MITIGATION MEASURE(S)***

No mitigation is required.

***LEVEL OF SIGNIFICANCE***

The Project would have *no impact*.

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than- Significant Impact	No Impact
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### 3.4.13 - NOISE

Would the Project result in:

- |    |  |                          |                                     |                                     |                          |
|----|--|--------------------------|-------------------------------------|-------------------------------------|--------------------------|
| a. | Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |
| b. | Generation of excessive groundborne vibration or groundborne noise levels?   | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 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? | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Discussion

**Impact #3.4.13a – Would the Project result in 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?**

Construction noise typically occurs intermittently and varies depending upon the type and phase of construction, i.e. demolition, land clearing, grading, excavation. The United States Environmental Protection Agency (EPA) has determined that the average noise levels associated with construction typically range from approximately 76dBA to 84 dBA Leq, with intermittent individual construction equipment noise levels ranging from approximately 75 dBA to more than 88 dBA for brief periods.

The Madera County General Plan Noise Element provides the following maximum allowable noise exposure for non-transportation noise sources.

	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Hourly Leq, dB	50	45
Maximum level, dB	70	65

***Construction***

The construction of the proposed Project would entail the use of construction-related equipment, i.e. forklifts, tractors, loaders, backhoes. Construction noise would result from operation of machinery and equipment used in the construction process. Noise impacts associated with the proposed Project construction would result in temporary or periodic increases in ambient noise levels, primarily during trenching and horizontal directional drill activities. The in-town collection system would consist of gravity sewers to direct the effluent to the pump station and force main that would convey the wastewater to the existing Chowchilla WWTF. Construction of the pump station could require cranes and possibly pile driving equipment in addition to other common construction techniques.

With the implementation of the Mitigation Measure NSE-1, construction activities would occur during the daytime hours between 7:00 a.m. and 10:00 p.m. and will not exceed the 70-dB maximum level, unless residents are otherwise properly notified. As such, the potential noise impacts are expected to be less than significant with mitigation incorporated.

***Operation***

The existing Chowchilla WWTF would not be modified; there would be no change in noise levels. There would be no noise impacts from operation of the system because the pump station would be housed in a building, muffling significant sound, and the STEP pumps would be small and located in sumps below ground at each house, again muffling significant sound. The proposed Pump Station facilities would be located sub-grade; therefore, noise generation would not likely attenuate outside of the building. A backup generator would be located inside the pump station and would only be operated during power failures. Given the limited likelihood for emergency conditions the stationary noise impacts associated with the ongoing operations of the pump station, the potential noise impact would be less than significant.

***MITIGATION MEASURE(S)***

**MM NSE-1:** Madera County shall incorporate the following BMPs to minimize noise impacts during construction activities:

- Construction shall be limited to daytime hours between 7:00 a.m. and 7:00 p.m. Monday through Friday and 9:00 a.m. and 5:00 p.m. on Saturdays.
- All construction equipment shall be equipped with sound-control devices no less effective than those provided on the original equipment. Equipment shall have a muffled exhaust.
- Appropriate additional noise-reducing measures will be implemented, including but not limited to:
  - Changing the location of stationary construction equipment when practical; and
  - Shutting off idling equipment.

- If construction activities are required outside of the daytime working hours described above, Madera County shall notify residents 48 hours in advance. If after-hour construction is required due to an emergency, Madera County will notify nearby residents immediately.

#### **LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact with mitigation*.

#### **Impact #3.4.13b – Would the Project result in generation of excessive groundborne vibration or groundborne noise levels?**

##### **Construction**

Construction equipment used during the proposed Project such as backhoes, mechanical compactors, and other equipment may generate localized groundborne vibration or noise levels. The in-town collection system would consist of gravity sewers to the force main that would convey the wastewater to the existing Chowchilla WWTF. In addition, the collection system would require construction of a pump station. The construction of the pump station could require cranes and possibly pile driving equipment in addition to other common construction techniques.

Potential groundborne vibrations or noise would be temporary and would occur during daylight hours. The tunneling under SR 99 would entail either a horizontal directional drill or jack and bore. These systems trigger groundborne vibration when excavating the pilot hole; however, all vibrations in this area are expected to be similar or gentler in nature than the freeway and rail-road operations. Therefore, groundborne noise and vibration impacts are considered less than significant.

##### **Operation**

Operation of the Project would not include any activities which would create groundborne vibrations, and operation of the collection system would not be significantly different than the current operational practices relative to ground vibrations. Therefore, the proposed Project operation would not result in excessive groundborne vibration or groundborne noise levels. This impact is less than significant.

##### **MITIGATION MEASURE(S)**

No mitigation is required.

#### **LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact*.

#### **Impact #3.4.13c – 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?

The Project area extends from the Community of Fairmead to the Chowchilla WWTF. Although Fairmead does not have an airport located within two miles of it, the Project as it is constructed and approaches the WWTF comes to be within two miles of the Chowchilla Municipal Airport. As the Project approaches the WWTF through Avenue 24, it crosses into territory designated Area D, "Other Airport Environs," of the Madera Countywide Airport Land Use Compatibility Plan. However, this zone has been distinguished as having a low risk level as well as a low noise impact (Madera County, 2015). Therefore, the impact is less than significant.

**MITIGATION MEASURE(S)**

No mitigation is required.

**LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact*.



	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less- than Significant Impact	No Impact
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### 3.4.14 - POPULATION AND HOUSING

Would the Project:

- |   |                          |                          |                                     |                                     |
|---|--------------------------|--------------------------|-------------------------------------|-------------------------------------|
| a. Induce substantial population unplanned growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| b. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

### Discussion

This analysis relied upon the Fairmead Colony Area Plan for evaluating the significance of the Project's impacts to Population and Housing issues outlined in this section.

#### Impact #3.4.14a – Would the Project induce substantial population unplanned growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

The Project consists of replacing septic tanks and leach fields with the establishment of a wastewater collection system that connects to the Chowchilla WWTF. This will provide a reliable, safe method of wastewater disposal for the existing members of the Community of Fairmead. The Fairmead Colony Area Plan establishes priorities of Community issues to address, with one of the highest prioritized issues being growth and revitalization. The Plan states, "little or no improvements have been made to the Community for many decades... there is a strong desire to revitalize the Community through growth and reinvestment" (Madera County, 2012). Investing in a modern, efficient method of wastewater disposal is a major step towards revitalization of the Community.

Recent changes to the County Plan Boundary for Fairmead propose a larger planning area than in the General Plan, meant to accommodate a growing population. The Project may not lead to a substantial population growth, but the establishment of the wastewater collection system will allow for future growth to occur, attracting businesses and new residents, thus achieving a goal set by the Community. Therefore, the Project will have a less-than-significant impact on unplanned substantial population growth.

**MITIGATION MEASURE(S)**

No mitigation is required.

**LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact*.

**Impact #3.4.14b – Would the Project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?**

The proposed Project does not propose to displace any existing housing or people in the Project area, nor would implementation of the Project require construction or replacement of housing.

In addition, it is anticipated that construction workers would come from the surrounding area and would not require new housing. The proposed Project would not displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere. Therefore, the Project would have no impact.

**MITIGATION MEASURE(S)**

No mitigation is required.

**LEVEL OF SIGNIFICANCE**

The Project would have *no impact*.

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than- Significant Impact	No Impact
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### 3.4.15 - PUBLIC SERVICES

Would the Project:

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

i. Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ii. Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iii. Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iv. Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
v. Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

### Discussion

In general, impacts to public services from implementation of a Project would be due to a project's ability to induce population growth over time that would require a greater need for fire and police protection, etc. to accommodate the increased population. The Proposed project consists of replacing septic tanks and leach fields with the establishment of a wastewater collection system that connects to the Chowchilla WWTF. The Project may not lead to a substantial population growth, but the establishment of the wastewater collection system could potentially attract more businesses and residents.

**Impact #3.4.15a(i) – 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 to other performance objectives for any of the public services - Fire Protection?**

The Madera County Fire Department provides fire protection services to all of Madera County. The closest fire station to Fairmead would be Fire Station #2, located five miles to

the northwest in Chowchilla. According to the Madera County General Plan, fire emergency services in Fairmead are sufficient (County of Madera, 1995). Additionally, fire suppression support within Chowchilla is provided by the City of Chowchilla Volunteer Fire Department (CVFD). The CVFD has one station located on the south portion of the Chowchilla Corporation Yard site, just less than 1.5 miles north of the WWTF. Given the nature of the Project, there will not be an increase in the need for fire protection services beyond the baseline condition. Therefore, there would be a less-than-significant impact on the need for additional fire protection.

**MITIGATION MEASURE(S)**

No mitigation is required.

**LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact*.

**Impact #3.4.15a(ii) – 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 to other performance objectives for any of the public services – Police Protection?**

Law enforcement in the unincorporated area of the County is provided by the County Sheriff's Department. The county is divided into eight beat areas, with one officer on duty per beat at any one time. The deputies on patrol in their assigned beat respond to calls as they come in (County of Madera, 1995). The County faces issues of being understaffed; however, additional law enforcement and public protection are provided by the City of Chowchilla Police Department. The City's police station is located on Trinity Avenue between South 2nd Street and South 1st Street. The station is located approximately 1.3 miles to the north of the WWTF. Given the nature of the Project, police protection will not be affected there will be no contributing to this problem beyond the current baseline condition. Therefore, there would be a less-than-significant impact on the need for additional police protection.

**MITIGATION MEASURE(S)**

No mitigation is required.

**LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact*.

**Impact #3.4.15a(iii) – 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 to other performance objectives for any of the public services – Schools?

The installation of a sewer collection system is not anticipated to increase the population of existing schools or necessitate the construction of additional schools. The population of neither the Community of Fairmead nor the City of Chowchilla would increase beyond what has been planned for. Therefore, there would be a less-than-significant impact on the need for additional educational facilities.

**MITIGATION MEASURE(S)**

No mitigation is required.

**LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact*.

**Impact #3.4.15a(iv) – 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 to other performance objectives for any of the public services – Parks?**

In Fairmead, the existing parks, the Tot Lot on Arnott and the Chukchansi Community Park, are located along the Project site. Chowchilla operates and maintains four parks. However, the Project would not increase the use of the existing parks or other recreational facilities, nor would it necessitate the construction of new facilities. Therefore, there would be a less-than-significant impact on the need for additional parks.

**MITIGATION MEASURE(S)**

No mitigation is required.

**LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact*.

**Impact #3.4.15a(v) – 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 to other performance objectives for any of the public services – Other Public Facilities?**

The Project would not induce the use of other public facilities such as libraries, courts, and other Madera County or City of Chowchilla services.

The proposed Project would not 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 a significant environmental impact, in order to maintain acceptable service ratios for any of the public services. Therefore, the Project would have a less-than-significant impact.

***MITIGATION MEASURE(S)***

No mitigation is required.

***LEVEL OF SIGNIFICANCE***

The Project would have a *less-than-significant impact*.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than- Significant Impact	No Impact
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### 3.4.16 - RECREATION

Would the Project:

- |  |                          |                          |                          |                                     |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a. Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b. Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?                        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

### Discussion

**Impact #3.4.16a – 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?**

The proposed Project site would not affect any recreation areas. The existing parks in Fairmead, the Tot Lot on Arnott and the Chukchansi Community Park, and the parks in Chowchilla are located near the Project site, however, the Project would not increase the use of the existing parks or other recreational facilities, nor would it necessitate the construction of new facilities. Therefore, no impacts would occur.

### MITIGATION MEASURE(S)

No mitigation is required.

### LEVEL OF SIGNIFICANCE

The Project would have *no impact*

**Impact #3.4.16b – Would the Project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?**

See Impact #3.4.16a, above.



***MITIGATION MEASURE(S)***

No mitigation is required.

***LEVEL OF SIGNIFICANCE***

The Project would have *no impact*.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than- Significant Impact	No Impact
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### 3.4.17 - TRANSPORTATION AND TRAFFIC

Would the Project:

a.	Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b.	Conflict or be inconsistent with CEQA Guidelines Section 15064.3, Subdivision (b)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c.	Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d.	Result in inadequate emergency access?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### Discussion

**Impact #3.4.17a – Would the Project conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?**

In the unadopted Fairmead Colony Area Plan, goals, objectives, and policies are outlined in order to ensure enhanced mobility is provided within the community and to the surrounding region, create a community that provides for all modes of transportation, and create a safer environment for all modes of transportation. Given the nature of the Project, vehicles associated with construction could block roadways and walkways. However, this disruption would only be localized and temporary in nature and would cease to occur once installation of the sewer collection system was completed. Once operational, the Project would not generate traffic beyond current levels. Therefore, the Project would not conflict with any applicable Circulation Plan and any impacts would be less than significant.

### MITIGATION MEASURE(S)

No mitigation is required.

### LEVEL OF SIGNIFICANCE

The Project would have a *less-than-significant impact*.

**Impact #3.4.17b – Would the Project conflict or be inconsistent with CEQA Guidelines Section 15064.3, Subdivision (b)?**

A traffic memorandum was prepared by VRPA Technologies (see Appendix G). The memorandum determined the Project trip generation for both the construction and operational phases of the Project. The Project will not generate a substantial number of trips during its operation but would generate some trips during the construction phase of the Project. The construction phases would include workers such as laborers, craftsmen, supervisory personnel, support personnel, and construction management personnel. Modeling for the total Project trip generation for the construction phase would have a volume of 80 Daily Trip Ends (ADT) (VRPA Technologies, 2020). The Project would not generate any additional trips beyond those needed for construction, therefore any impacts would be less than significant.

**MITIGATION MEASURE(S)**

No mitigation is required.

**LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact*.

**Impact #3.4.17c – 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)?**

The Project would not introduce new curves and/or hazardous intersections into the Project vicinity. All roads in the Project site are linear and set in a grid pattern. No new design or features would be introduced that would result in transportation-related hazards or safety concerns. The proposed Project would not result in an increase in hazards due to a design feature or incompatible use, making any impacts less than significant.

**MITIGATION MEASURE(S)**

No mitigation is required.

**LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact*.

**Impact #3.4.17d – Would the Project result in inadequate emergency access?**

See discussion in Impact 3.4.9f.

With mitigation incorporated, any impacts to emergency access would be less than significant.

***MITIGATION MEASURE(S)***

Implementation of Mitigation Measure MM HAZ-2.

***LEVEL OF SIGNIFICANCE***

The Project would have a *less-than-significant impact with mitigation incorporated.*

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than- Significant Impact	No Impact
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### 3.4.18 - TRIBAL CULTURAL RESOURCES

Would the Project:

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

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

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☒
☐
☐

- 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.

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☐

### Discussion

**Impact #3.4.18a(i) – 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 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)?**

On February 3<sup>rd</sup>, 2020, a response from the Native American Heritage Commission provided the contacts for four tribes to consult. The Dumna Wo-Wah Tribal Government, the North

Valley Yokuts Tribe, the Southern Sierra Miwuk Nation, and the Wuksache Indian Tribe/Eshom Valley Band were sent letters of opportunity for consultation. Follow up letters were sent out on March 2nd, 2020. The City did not receive any requests for consultation from the tribes.

To avoid any impacts to culturally significant resources, the implementation of mitigation measures MM CUL-1 and CUL-2 will be implemented. The Project is less than significant with mitigation incorporated.

For further information, including mitigative measures, see *Section 3.4.5 – Cultural Resources*.

#### **MITIGATION MEASURE(S)**

Implementation of Mitigation Measures MM CUL-1 and MM CUL-2.

#### **LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact with mitigation incorporated*.

**Impact #3.4.18a(ii) – 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 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?**

Research of the Project site consisted of a records search of recorded historical and archaeological sites and maps of the affected area by personnel at the SSJVIC, a literature review of historic and archaeological data pertaining to the area in question, and a field survey. Native American Correspondence was pursued for information regarding the area only. The County is consulting with the Native American Heritage Commission and affected tribes under AB 52. The Records Search conducted by the SSJVIC resulted in no previously reported cultural resources within the Project area. Per AB 52, the City mailed project notice letters to the four tribes that are culturally affiliated to the Project site. Consultation letters were sent to these tribes on February 3, 2020 and follow-up letters were sent on March 2, 2020. The City did not receive any responses from the tribes within the 30-day response period requesting any consultation. The City has not received any requests for consultation or other indications that any tribal cultural resources of concern exist within the area.

#### **MITIGATION MEASURE(S)**

Implementation of Mitigation Measures MM CUL-1 and MM CUL-2.

***LEVEL OF SIGNIFICANCE***

The Project would have a *less-than-significant impact with mitigation incorporated*.



Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than- Significant Impact	No Impact
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### 3.4.19 - UTILITIES AND SERVICE SYSTEMS

Would the Project:

- |  |                          |                          |                                     |                          |
|--|--------------------------|--------------------------|-------------------------------------|--------------------------|
| a. Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which would cause significant environmental effects? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b. Have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry and multiple dry years?  | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| c. Result in a determination by the wastewater treatment provider that 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?   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 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?  | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| e. Comply with federal, State, and local management and reduction statutes and regulations related to solid waste?   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Discussion

**Impact #3.4.19a – Would the Project 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 would cause significant environmental effects?**

The Project is the construction of a wastewater collection system and not will require the relocation or construction of new or expanded water, storm water drainage, natural gas, or telecommunications facilities. As stated in *Section 3.4.6-Energy*, the short-term increase in energy use (electrical power) associated with the Project construction will be in compliance

with all applicable plans and standards, and the Project operations will return to its existing conditions upon Project completion. Therefore, there would be no impact.

The Community of Fairmead is proposing to connect to the City of Chowchilla's existing wastewater treatment facility located at 15750 Avenue 24½, Chowchilla, CA 93610. This would require construction of a sewer collection system and transmission line from Fairmead to Chowchilla. The proposed project can be described in three categories.

#### ***Fairmead Gravity Collection System and Lift Station***

The proposed Project would abandon the existing septic tanks and leach fields in Fairmead and direct wastewater flows into a new sewer collection system within Fairmead. Approximately 175 residential connections, the Fairmead Elementary School, and a commercial property will be serviced by this new collection system.

The new sewer collection system will drain to a centrally located pump lift station in four inches to 10 inches diameter sewer pipes, with 4-foot or 5-foot-diameter manholes spaced at least every 500 feet. Gravity sewer trenches will be 1.5 feet to 3 feet wide and vary from 3 feet to 20 feet deep.

The sewer lift station will be centrally located in Fairmead, 20 feet to 25 feet deep, with appurtenances to include a standby generator, an earthen emergency basin, an odor control scrubber, and a small building to house electrical panels, all on a one-acre site.

#### ***Force Main and Gravity Sewer Line***

The proposed lift station will discharge effluent to a force main that will consist of one to two 4-inch to 8-inch-diameter pipes approximately 2.5 miles long from the Community of Fairmead to Avenue 24 on the west side of Highway 99, inside the City of Chowchilla.

The City's existing 18-inch gravity sewer main will be extended south along Road 16 and then east along Avenue 24 and will terminate on the west side of Highway 99 for a distance of 2.2 miles where it will connect to the new force main.

Both the force main and gravity main will be installed in the roadway and roadway shoulders. The alignment will encounter the Berenda Slough as well as three canals. The preferred method to cross the Berenda Slough would be to attach the pipeline to the bridge that passes over the slough; this would be the least invasive and cheapest option. However, if the pipeline is not able to be attached to the bridge, the construction crew will jack and bore the pipeline beneath the Berenda Slough. The jack and bore method will be applied to the three canals. Additionally, the Project requires tunneling beneath SR 99 and the Union Pacific Railroad. The total length of both the proposed gravity line and the proposed force main segment will be 4.7 miles.

With the additional flow from Fairmead being conveyed through the existing 18-inch gravity main, peak flows may cause a back-up where the existing and proposed lines come together at the intersection of Avenue 24½ and Road 16. In an effort to lessen any potential flow

disruption, a short length of 10-inch pipe at that connection will be replaced with 24-inch pipe with two manholes.

### ***Wastewater Treatment Facility Improvements***

In order to satisfy the need for additional capacity to serve Fairmead, and the redundancy needed to serve both Chowchilla and Fairmead, a 0.9 MGD package treatment facility will be constructed. The addition of Fairmead would push the existing flows to over 0.9 MGD which is the current facility capacity with one of the treatment trains offline. Construction of a new 0.9 MGD package treatment facility would act as a third treatment train and bring the effective capacity closer to 1.8 MGD although not expected to operate at this level since one train will by cycle offline for maintenance during normal operations. The new package treatment facility offers redundancy during maintenance periods and its more current and efficient design would make it the primary treatment train.

The existing bar screen is does not perform sufficiently as it allows passthrough of solids that cause problems and blockages further along in the treatment train. The addition of Fairmead is likely to exacerbate the effectiveness of the existing system. The installation of an additional bar screen will lessen the burden on the existing structure and allow Public Works staff to take one offline for cleaning and maintenance, increasing solids removal earlier in the process and improving the quality of water passed to the next stage of treatment.

The proposed Project would allow the District to provide a public wastewater system to the community of Fairmead. The Project would reduce the potential for aging septic systems in the Project area to fail, which would reduce potential degradation/pollution of the groundwater and minimize the potential for nuisance odors.

The Chowchilla WWTF is covered under Regional Board Order #90-271 for their Waste Discharge Requirement (WDR), and the proposed Project would adhere to the WDR. The proposed Project includes the utilization of the existing Chowchilla WWTF and construction of a forcemain and collection system, and would not indirectly trigger any wastewater facility upgrades, as could be the case with a proposed commercial or housing development project. All environmental impacts associated with the Project would be avoided or mitigated to a less-than-significant level. Therefore, environmental effects and impacts would be considered less than significant.

### ***MITIGATION MEASURE(S)***

No mitigation is required.

### ***LEVEL OF SIGNIFICANCE***

The Project would have a *less-than-significant impact*.

**Impact #3.4.19b – Would the Project have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry and multiple dry years?**

The proposed Project involves the construction of a wastewater collection system, pump station, and force main. Project construction activities may require additional water supply for dust control, clean-up, soil compaction, and facility testing. Additional water use during construction would be temporary and minimal and would not create a significant impact that would require new or expanded water supply resources.

Operation of the new facilities may require additional water for the operations and maintenance of the WWTF facility; however, demand would be minimal and potential impacts would be considered less than significant. Furthermore, no new wells that could place additional water supply demands on the local aquifer are proposed as part of the Project. It is expected that water demands needed to operate the increased inflow to the existing WWTF would be similar to existing conditions and would not place additional stress on the local water supply system. Therefore, environmental effects and impacts would be considered less than significant.

#### **MITIGATION MEASURE(S)**

No mitigation is required.

#### **LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact*.

**Impact #3.4.19c – Would the Project result in a determination by the wastewater treatment provider that serves or may serve the Project that it has adequate capacity to serve the Project’s projected demand in addition to the provider’s existing commitments?**

The wastewater treatment facility improvements will satisfy the need for additional capacity to serve Fairmead, and the redundancy needed to serve both Chowchilla and Fairmead, by constructing the 0.9 MGD package treatment facility. The addition of Fairmead would push the existing flows to over 0.9 MGD which is the current facility capacity with one of the treatment trains offline. Construction of a new 0.9 MGD package treatment facility would act as a third treatment train and bring the effective capacity closer to 1.8 MGD although not expected to operate at this level since one train will by cycle offline for maintenance during normal operations. The new package treatment facility offers redundancy during maintenance periods and its more current and efficient design would make it the primary treatment train.

Long-term operation of the site would not adversely affect wastewater treatment capacity, because the Chowchilla WWTF is covered under Regional Board Order #90-271 for their Waste Discharge Requirement (WDR), and the proposed Project would adhere to the WDR. The increased treatment at the current WWTF would not exceed the current limits of the existing permits. Therefore, environmental effects and impacts would be considered less than significant.

**MITIGATION MEASURE(S)**

No mitigation is required.

**LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact*.

**Impact #3.4.19d – Would the Project 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?**

Debris created from installation of the new forcemain and collection system acceptable for disposal would be taken to the Fairmead Landfill Facility in Fairmead, California or the North Fork Transfer Station in North Fork. Waste created may include organic waste from tree trimming and grubbing to develop staging areas as well as any graded and excavated dirt from construction of the proposed Project. The proposed Project may minimally and temporarily increase solid waste production over the current levels. However, the Fairmead Landfill is estimated to have approximately 13 years of capacity remaining (2028), and its facilities are able to accept solid waste materials generated by the construction of the proposed Project. Impacts from solid waste generation would be less than significant.

**MITIGATION MEASURE(S)**

No mitigation is required.

**LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact*.

**Impact #3.4.19e – Would the Project comply with federal, State, and local statutes and regulations related to solid waste?**

The California Integrated Waste Management Act requires every county to adopt an Integrated Waste Management Plan (IWMP) that describes county objectives, policies, and programs relative to waste disposal, management, source reduction, and recycling. Title 7.24 of the Madera County Code, the Solid Waste Ordinance, outlines the standards and practices implemented to manage solid waste. The proposed Project would comply with the County's IWMP for new and existing developments. Furthermore, the removal of solid waste due to construction activities would comply with all governmental statutes and regulations, rendering the impact to solid waste statutes and regulations, including the CalGreen Code, which requires a CWMP. Therefore, impacts would be considered less than significant.

**MITIGATION MEASURE(S)**

No mitigation is required.

***LEVEL OF SIGNIFICANCE***

The Project would have a *less-than-significant impact*.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than- Significant Impact	No Impact
<b>3.4.20 - WILDFIRE</b>				
Would the Project:				
a. Substantially impair an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose Project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

### Discussion

#### Impact #3.4.20a – Would the Project substantially impair an adopted emergency response plan or emergency evacuation plan?

See discussion in Impact 3.4.9f.

With mitigation incorporated, any impacts to emergency access would be less than significant.

#### MITIGATION MEASURE(S)

Implementation of Mitigation Measure MM HAZ-2.

#### LEVEL OF SIGNIFICANCE

The Project would have a *less-than-significant impact with mitigation incorporated*.



**Impact #3.4.20b – Would the Project due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose Project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?**

According to the Fire Hazard Severity Zones Map of Madera County, provided by Cal Fire, the Project area is not in a high fire hazard severity zone (Cal Fire, 2007). All construction under the proposed Project shall comply with current California Fire Code and County standards, minimizing potential risks to wildfire exposure. Therefore, the impact would be less than significant.

**MITIGATION MEASURE(S)**

No mitigation is required.

**LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact*.

**Impact #3.4.20c – 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?**

The Project consists of replacing septic tanks and leach fields with the establishment of a wastewater collection system that connects to the Chowchilla WWTF. Given the nature of the Project, additional infrastructure associated with the Project is not expected to be required, but if needed, would be minimal. There would be no additional exposure to fire risk as a result of infrastructure associated with the Project and would therefore have a less-than-significant impact.

**MITIGATION MEASURE(S)**

No mitigation is required.

**LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact*.

**Impact #3.4.20d – 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?**

See discussion of Impact #3.4.10c(i) related to erosion impacts due to drainage changes. Due to the low risk of fire in the Project area, the nature of this Project, and the relatively flat topography of the Project site, downslope or downstream flooding impacts due to runoff, post-fire slope instability, and/or drainage changes would be less than significant with mitigation incorporated.

***MITIGATION MEASURE(S)***

Implementation of mitigation measures MM HYD-1 and MM HYD-2.

***LEVEL OF SIGNIFICANCE***

The Project would have a *less-than-significant impact*.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than- Significant Impact	No Impact
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### 3.4.21 - MANDATORY FINDINGS OF SIGNIFICANCE

- |    |  |                          |                                     |                          |                          |
|----|--|--------------------------|-------------------------------------|--------------------------|--------------------------|
| a. | Does the Project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b. | Does the Project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a Project are significant when viewed in connection with the effects of past Projects, the effects of other current Projects, and the effects of probable future Projects.)   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c. | Does the Project have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly?   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

### Discussion

**Impact #3.4.21a – Does the Project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?**

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

degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory. Therefore, the Project would have a less-than-significant impact with mitigation incorporated.

**MITIGATION MEASURE(S)**

Implementation of Mitigation Measures MM BIO-1 through MM BIO-12.

**LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact with mitigation incorporated*.

**Impact #3.4.21b - Does the Project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a Project are significant when viewed in connection with the effects of past Projects, the effects of other current Projects, and the effects of probable future Projects.)?**

As described in the impact analyses in Sections 3.14.1 through 3.4.20 of this IS/MND, any potentially significant impacts of the proposed Project would be reduced to a less-than-significant level following incorporation of the mitigation measures listed beginning on Page 2 of this IS/MND. Projects completed in the past have also implemented mitigation, as necessary. Accordingly, the proposed Project would not otherwise combine with impacts of related development to add considerably to any cumulative impacts in the region. With mitigation, the proposed Project would not have impacts that are individually limited, but cumulatively considerable. Therefore, the Project would have a less-than-cumulatively-considerable impact with mitigation incorporated.

**MITIGATION MEASURE(S)**

Implementation of Mitigation Measures MM BIO-1 through MM BIO-12, MM CUL-1 through MM CUL-3, MM GEO-1 through MM GEO-7, MM HAZ-1 and MM HAZ-2, MM HYD-1, and MM NSE-1.

**LEVEL OF SIGNIFICANCE**

The Project would have a *less-than-significant impact with mitigation incorporated*.

**Impact #3.4.21c - Does the Project have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly?**

All of the Project’s impacts, both direct and indirect, that are attributable to the Project were identified and mitigated. As shown beginning on Page 2 of this IS/MND, the District has agreed to implement mitigation measures, substantially reducing or eliminating impacts from the Project. Therefore, the proposed Project would not either directly or indirectly

cause substantial adverse effects on human beings because all potentially adverse direct impacts of the proposed Project are identified as having no impact, less-than-significant impact, or less-than-significant impact with mitigation.

***MITIGATION MEASURE(S)***

Implementation of Mitigation Measures MM BIO-1 through MM BIO-12, MM CUL-1 through MM CUL-3, MM GEO-1 through MM GEO-7, MM HAZ-1 and MM HAZ-2, MM HYD-1, and MM NSE-1.

***LEVEL OF SIGNIFICANCE***

The Project would have a *less-than-significant impact with mitigation incorporated*.

## **SECTION 4 - LIST OF PREPARERS**

### ***4.1 - Lead Agency***

City of Chowchilla  
130 S. 2nd Street  
Chowchilla, CA 93610  
559-665-8615

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- Amber Williams, Assistant Planner – Author
- Dylan Ayers, Associate Environmental Scientist – Author
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- Desmond Johnston, AICP, Senior Planner – QA/QC

### ***4.3 - Subconsultants***

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- Katie M. McComas, M.S., Paleontological Report Writer & GIS Specialist; Thomas A. Deméré, Ph.D., Principal Paleontologist
- Mark Kile, PhD., Principal Investigator, Culturescape – Author

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**APPENDIX A**  
**MITIGATION MONITORING AND REPORTING PROGRAM**



Impact No.	Mitigation Measure	Implementation Agency	Monitoring Agency	Date and Signature of Party Responsible for Verification of Compliance
<b>Biological Resources</b>				
<b>MM BIO-1</b>	<b>MM BIO-1:</b> Within 14 days of the start of Project activities, a pre-activity survey for spiny-sepaled button celery, western spadefoot, western pond turtle, western burrowing owl, northern harrier, hoary bat, Yuma myotis, San Joaquin kit fox, and American badger shall be conducted by a qualified biologist knowledgeable in the identification of these species. The pre-activity survey should include survey of: (1) Aquatic resources and grassy areas with moist conditions including the wetlands, vernal pools, artificial basins, and road ditches to determine presence of spiny-sepaled button celery, (2) Aquatic resources within the BSA including Berenda Slough, canals and ditches, emergent wetlands, vernal pools, artificial basins, road ditches, and puddles to determine presence of western spadefoot; (3) Berenda Slough to determine presence of western pond turtle, (4) Annual grassland habitat, gores along SR 99, and berms along the canals/ditches to identify presence of burrowing owls and their burrows, (5) Annual grassland and dryland grain crops to identify	City of Chowchilla/Project Contractor	City of Chowchilla/Project Inspector	

	presence of northern harries, (6) Annual grassland and the riparian habitat along Berenda Slough to determine presence of American badgers and their dens, (7) Annual grassland to determine presence of San Joaquin kit foxes and their dens, and (8) Eucalyptus, cottonwood, and oak trees along Berenda Slough as well as the Road 16 bridge to determine presence of roosting bats. The transects shall be spaced at no greater than 30-foot intervals in order to obtain a 100 percent coverage of the Project site and a 250-foot buffer. Areas devoid of habitat incapable of supporting these species will not require surveys. If no evidence of these special-status species is detected, no further action is required.			
<b>MM BIO-2</b>	If spiny-sepaed button celery is documented during the pre-activity survey within the area of Project disturbance, the species occurrences shall be mapped using Geographic Information Systems (GIS) and shall be avoided to the most possible extent. If the spiny-sepaed button celery cannot be avoided and needs to be removed, the designated biologists shall assure that self-sustaining population of this species remains in place.	City of Chowchilla/Project Contractor	City of Chowchilla/Project Inspector	
<b>MM BIO-3</b>	Because there is potential for vernal pool fairy shrimp to occur within wetland W1 along Fairmead Boulevard, this wetland shall be avoided during construction of the proposed	City of Chowchilla/Project Contractor	City of Chowchilla/Project Inspector	

	alignment to assure no impact to these species will occur. If avoidance is not feasible, protocol level survey following the <i>Survey Guidelines for the Listed Large Branchiopods</i> (USFWS 2015) shall be conducted during the wet season to determine presence/absence of this species. If vernal pool fairy shrimp are identified or it is assumed that vernal pool fairy shrimp are present, a Biological Opinion from the USFWS shall be required. Impacts to vernal pool fairy shrimp will be mitigated with habitat replacement at a three to one ratio with an approved mitigation bank.			
<b>MM BIO-4</b>	Because western spadefoot was identified during the reconnaissance survey within the BSA, Environmentally Sensitive Area (ESA) fencing capable of precluding western spadefoots from entering construction areas will be installed anywhere where western spadefoots would be identified during the pre-construction survey or during the duration of the Project. Fencing shall consist of 16-inch metal flashing or an equivalent material and shall be buried six inches below the ground surface, extending at least eight inches above the ground. No insecticides, herbicides, fertilizers, or other chemicals that might harm the western spadefoot will be used in the buffer zone.	City of Chowchilla/Project Contractor	City of Chowchilla/Project Inspector	

<b>MM BIO-5</b>	If during the construction period the Berenda Slough is inundated, weekly examinations of slough shall occur to determine presence of western pond turtles. If western pond turtles are found in Berenda Slough, barrier fencing will be installed between the stream and upland habitat to prevent entrance into work areas along the banks of the slough. Fencing will consist of 16-inch metal flashing or an equivalent material and will be buried six inches below the ground surface, extending at least 8 inches above the ground. If western pond turtles are found in upland habitat within the work area, a 100-foot buffer will be set up around nearby construction zones to prohibit turtles from entering work areas, and turtles will be relocated to similar habitat in which they are found or in other suitable habitat (e.g., downstream) outside the 100-foot buffer.	City of Chowchilla/Project Contractor	City of Chowchilla/Project Inspector	
<b>MM BIO-6</b>	If Project activities must occur during the nesting season (February 15 to August 31), pre-activity surveys will be conducted for Swainson's hawk nests in accordance with the <i>Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley</i> (CDFW 2020). The surveys will be conducted on and within 0.5-mile buffer of the Project. To meet the minimum level of protection for the species, surveys shall be conducted during at last two survey periods.	City of Chowchilla/Project Contractor	City of Chowchilla/Project Inspector	

<b>MM BIO-7</b>	If an active Swainson's hawk nest is discovered at any time within 0.5 miles of active construction, a qualified biologist shall complete an assessment of the potential for current construction activities to impact the nest. The assessment will consider the type of construction activities, the location of construction relative to the nest, the visibility of construction activities from the nest location, and other existing disturbances in the area that are not related to construction activities of this Project. Based on this assessment, the biologist will determine if construction activities can proceed and the level of nest monitoring required. Construction activities shall not occur within 500 feet of an active nest but depending upon conditions at the site this distance may be reduced. Full-time monitoring to evaluate the effects of construction activities on nesting Swainson's hawks may be required. The qualified biologist shall have the authority to stop work if it is determined that Project construction is disturbing the nest. These buffers may need to increase depending on the sensitivity of the nesting Swainson's hawk to disturbances and at the discretion of the qualified biologist. Construction that requires coming within 500 feet of an active nest must obtain an Incidental Take Permit (ITP) from the California Department of Fish and Wildlife.	City of Chowchilla/Project Contractor	City of Chowchilla/Project Inspector	
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<b>MM BIO-8</b>	<p>The following avoidance and minimization measures will be implemented during all phases of the Project to reduce the potential for impact from the Project. They are modified from the <i>U.S. Fish and Wildlife Service Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance</i> (USFWS, 2011).</p> <ul style="list-style-type: none"> <li>• Project-related vehicles shall observe a daytime speed limit of 20-mph throughout the site in all Project areas, except on County roads and State and federal highways.</li> <li>• All Project activities shall occur during daylight hours, but if work must be conducted at night then a night-time construction speed limit of 10-mph shall be established.</li> <li>• Off-road traffic outside of designated Project areas shall be prohibited.</li> <li>• To prevent inadvertent entrapment of kit foxes or other animals during construction of the Project, all excavated, steep-walled holes or trenches more than two feet deep shall 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</li> </ul>	<p>City of Chowchilla/Project Contractor</p>	<p>City of Chowchilla/Project Inspector</p>	
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	<p>earthen-fill or wooden planks shall be installed.</p> <ul style="list-style-type: none"><li>• Before holes or trenches are filled, they shall be thoroughly inspected for trapped animals. If at any time a trapped or injured kit fox is discovered, the USFWS and the CDFW will be contacted before proceeding with the work.</li><li>• In the case of trapped animals, escape ramps or structures shall be installed immediately to allow the animal(s) to escape, or the USFWS and CDFW should be contacted for guidance.</li><li>• All construction pipes, culverts, or similar structures with a diameter of four inches or greater that are stored at a construction site for one or more overnight periods shall be thoroughly inspected for kit foxes and burrowing owls 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 shall 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.</li></ul>			
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	<ul style="list-style-type: none"><li>• All food-related trash items such as wrappers, cans, bottles, and food scraps shall be disposed of in securely closed containers and removed at least once a week from a construction or Project site.</li><li>• No pets, such as dogs or cats, shall be permitted on the Project site.</li><li>• Project-related use of rodenticides and herbicides shall be restricted.</li><li>• A representative shall be appointed by the Project proponent who will be the contact source for any employee or contractor who might inadvertently kill or injure a kit fox or who finds a dead, injured or entrapped kit fox. The representative shall be identified during the employee education program and their name and telephone number shall be provided to the USFWS and CDFW.</li><li>• Upon completion of the Project, all areas subject to temporary ground disturbances (including storage and staging areas, temporary roads, pipeline corridors, etc.) shall be recontoured if necessary, and revegetated to promote restoration of the area to pre-Project conditions. An area subject to "temporary" disturbance means any area that is disturbed during the Project, but after</li></ul>			
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	<p>Project completion will not be subject to further disturbance and has the potential to be revegetated.</p> <ul style="list-style-type: none"><li>• Any Project personnel who are responsible for inadvertently killing or injuring one of these species shall immediately report the incident to their representative. This representative shall contact the CDFW (and USFWS in the case of San Joaquin kit fox) immediately in the case of a dead, injured or entrapped San Joaquin kit fox, American badger, or western burrowing owl.</li><li>• The Sacramento Fish and Wildlife office and CDFW Region 4 office shall be notified in writing within three working days of the accidental death or injury to a San Joaquin kit fox during Project related activities. The CDFW shall be notified in the case of accidental death to an American badger or western burrowing owl. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal and any other pertinent information.</li><li>• New sightings of San Joaquin kit fox, American badger, or western burrowing owl shall be reported to the CNDDDB. A copy of the reporting form and a topographic map clearly marked</li></ul>			
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	with the location of where a San Joaquin kit fox was observed should also be provided to the USFWS.			
<b>MM BIO-9</b>	If Project activities must occur during the nesting season (February 1 to September 15), pre-activity nesting bird surveys shall be conducted within seven days prior to the start of construction at the construction site plus a 250-foot buffer for songbirds and a 500-foot buffer for raptors (other than Swainson's hawk). If no active nests are found, no further action is required. However, existing nests may become active and new nests may be built at any time prior to and throughout the nesting season, including when construction activities are in progress. If active nests are found during the survey or at any time during construction of the Project, an avoidance buffer ranging from 50 feet to 500 feet may be required, with the avoidance buffer from any specific nest being determined by a qualified biologist. The avoidance buffer shall remain in place until the biologist has determined that the young are no longer reliant on the adults or the nest. Work may occur within the avoidance buffer under the approval and guidance of the biologist, but full-time monitoring may be required. The biologist shall have the ability to stop construction if nesting adults show any sign of distress.	City of Chowchilla/Project Contractor	City of Chowchilla/Project Inspector	

<b>MM BIO-10</b>	If sign of day roosting bats is identified within the BSA during the pre-activity survey, a follow up flyout inspection of the potential roost shall be conducted at dusk. If roosting bats are found to be present, then acoustical sampling will be conducted to determine species. If any special-status species bats or maternity colony of bats are identified, appropriate mitigation measures to avoid impact and disturbance to these species will be developed. If any other bats are identified roosting during the maternity season (May through August), measures to avoid impact and disturbance to these bats will be developed.	City of Chowchilla/Project Contractor	City of Chowchilla/Project Inspector	
<b>MM BIO-11</b>	During construction, all efforts shall be made to avoid riparian habitat. The best method of confronting the Berenda Slough's riparian habitat would be to attach the pipeline to the bridge that crosses the slough. Prior to construction, an aquatic resource delineation shall be completed to determine the amount of riparian habitat within the Project site that may be impacted by proposed activities. In the event that riparian habitat is identified as being impacted, consultation with the CDFW shall be conducted to determine permitting needs and, if required, impacts to trees and vegetation in riparian habitat shall be replaced at a ratio of up to three to one.	City of Chowchilla/Project Contractor	City of Chowchilla/Project Inspector	

<b>MM BIO-12</b>	Prior to construction, a wetland delineation shall be completed to determine the amount of wetlands within the Project site that may be impacted by the proposed Project using standard wetland delineation measures required by the USACE. In the event that wetland resources, permits from the USACE, RWQCB, and CDFW for impacts to wetland resources may need to be acquired. It is assumed that the Project will be granted a nationwide permit from the USACE. Under the nationwide permit, impacts to aquatic and wetland resources greater than 1/10 <sup>th</sup> of an acre shall be compensated by in-kind compensatory credits at an approved mitigation bank or by utilizing an in-lieu fee program.	City of Chowchilla/Project Contractor	City of Chowchilla/Project Inspector	
<b>Cultural Resources</b>				

<b>MM CUL-1</b>	At a minimum, a Worker Environmental Awareness Training shall take place with those responsible for work prior to earthwork.	City of Chowchilla/Project Contractor	City of Chowchilla/Project Inspector	
<b>MM CUL-2</b>	An archeological monitor shall be present during initial subsurface work on Maple Street, Sinclair Street, Elm Street, and Avenue 22 ½, Avenue 23 ¾, and Yates Avenue.	City of Chowchilla/Project Contractor	City of Chowchilla/Project Inspector	

<b>MM CUL-3</b>	If prehistoric or historic-era cultural materials are encountered during construction activities, all work in the immediate vicinity of the find shall halt until a qualified archaeologist can evaluate the find and make recommendations. Cultural resource materials may include prehistoric resources such as flaked and ground stone tools and debris, shell, bone, ceramics, and fire-affected rock as well as historic resources such as glass, metal, wood, brick, or structural remnants. If the qualified archaeologist determines that the discovery represents a potentially significant cultural resource, additional investigations may be required to mitigate adverse impacts from Project implementation. These additional studies may include avoidance, testing, and evaluation or data recovery excavation. Implementation of the mitigation measure below would ensure that the proposed Project would not cause a substantial adverse change in the significance of a historical resource. Therefore, the Project would have a less-than-significant impact with incorporation of mitigation measures.	City of Chowchilla/Project Contractor	City of Chowchilla/Project Inspector	
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<b>MM CUL-4</b>	<p>If human remains are discovered during construction or operational activities, Section 7050.5 of the California Health and Safety Code applies, and the following procedures shall be followed: There shall be no further excavation or disturbance of the area where the human remains were found until the County Coroner/Sheriff's Office is contacted. Duly authorized representatives of the Coroner shall be permitted onto the Project site and shall take all actions consistent with Health and Safety Code Section 7050.5 and Government Code Section 27460, et seq. Excavation or disturbance of the area where the human remains were found or within 50 feet of the find shall not be permitted to recommence until the Coroner determines that the remains are not subject to the provisions of law concerning investigation of the circumstances, manner, and cause of any death. If the Coroner determines the remains are Native American, the Coroner shall contact the NAHC within 24 hours, and the NAHC shall identify the person or persons it believes to be the "most likely descendant" (MLD) of the deceased Native American. The MLD may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in PRC Section 5097.98.</p>	City of Chowchilla/Project Contractor	City of Chowchilla/Project Inspector	
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<b>Geology</b>				
<b>MM GEO-1</b>	Prior to the start of earthwork, a qualified Project Paleontologist shall be retained to oversee the paleontological mitigation program and should attend the pre-construction meeting to consult with Project contractors concerning excavation schedules, paleontological field techniques, and safety issues.	City of Chowchilla/Project Contractor	City of Chowchilla/Project Inspector	
<b>MM GEO-2</b>	A paleontological monitor shall be onsite during all excavations along the Project alignment that will directly impact the Modesto Formation, Riverbank Formation, and Turlock Lake Formation, with the exception of horizontal drilling for jack and bore installation. The paleontological monitor should be equipped to salvage fossils as they are unearthed (including bulk matrix samples containing microvertebrate fossils) to avoid construction delays. Paleontological monitoring may be reduced (e.g., part-time monitoring or spot-checking) or eliminated, at the discretion of the Project Paleontologist and in consultation with appropriate agencies (e.g., Project proponent, City of Chowchilla representatives). Changes to the paleontological monitoring schedule shall be based on the results of mitigation program as it unfolds during site development, and current and anticipated conditions in the field.	City of Chowchilla/Project Contractor	City of Chowchilla/Project Inspector	



<b>MM GEO-3</b>	If fossils are discovered, the Project Paleontologist (or paleontological monitor) should make an initial evaluation to determine their significance. All identifiable vertebrate fossils (large or small) and uncommon invertebrate, plant, and trace fossils are considered to be significant and should be recovered. Representative samples of common invertebrate, plant, and trace fossils should also be recovered, all effort should be made to complete the recovery in a timely manner. It is important to keep in mind that some fossil specimens (e.g., a large mammal skeleton) may require an extended salvage period. Because of the potential for the recovery of a small fossil remains (e.g., isolated teeth of small vertebrates), it may be necessary to collect bulk-matrix samples for screen washing or to set up an onsite screen washing station.	City of Chowchilla/Project Contractor	City of Chowchilla/Project Inspector	
<b>MM GEO-4</b>	In the event that fossils are discovered during a period when a paleontological monitor is not on site (i.e., inadvertent discovery), earthwork within the vicinity of the discovery site shall temporarily halt, and the Project Paleontologist contacted to evaluate the significance of the discovery. If the inadvertent discovery is determined to be significant, the fossils shall be recovered, as outlined in MM GEO-3.	City of Chowchilla/Project Contractor	City of Chowchilla/Project Inspector	

<b>MM GEO-5</b>	Fossil remains collected during monitoring and salvage should be cleaned, repaired, sorted, taxonomically identified, and cataloged as part of the mitigation program. Fossil preparation may also include screen-washing of bulk matrix samples for microfossils or other laboratory analyses (e.g., radiometric carbon dating,) if applicable. Fossil preparation and curation activities may be conducted at the laboratory of the contracted Project Paleontologist, at an appropriate outside agency, and/or at the designated repository, and shall follow the standards of the designated repository.	City of Chowchilla/Project Contractor	City of Chowchilla/Project Inspector	
<b>MM GEO-6</b>	Prepared fossils, along with copies of all pertinent field notes, photos, and maps, should be housed in an established, accredited museum repository with permanent, retrievable paleontological storage (e.g., University of California Museum of Paleontology, San Diego Natural History Museum). These procedures are essential steps in effective paleontological mitigation and CEQA compliance. The Project Paleontologist must have a writer repository agreement in hand prior to the initiation of mitigation activities. Mitigation of adverse impacts to significant paleontological resources is not complete until such curation into an established, accredited museum	City of Chowchilla/Project Contractor	City of Chowchilla/Project Inspector	

	repository has been fully completed and documented.			
<b>MM GEO-7</b>	A final summary report should be completed that outlines the results of the mitigation program. The report and inventory, when submitted to the appropriate Lead Agency, along with confirmation of the curation of recovered specimens into an established, accredited museum repository, will signify completion of the program to minimize impacts to paleontological resources. A copy of the paleontological monitoring report should be submitted to the Lead Agency and to the designated museum repository.	City of Chowchilla/Project Contractor	City of Chowchilla/Project Inspector	
<b>Hazards</b>				
<b>MM HAZ-1</b>	<p>Avoid/Minimize Potential Impacts from Construction Material Release. Prior to construction, the contractor shall develop a Spill Prevention and Contingency Plan for the proposed Project that at a minimum includes the following:</p> <ul style="list-style-type: none"><li>• Containment and cleanup equipment (e.g., absorbent pads, mats, socks, granules, drip pans, shovels, and lined clean drums) shall be at the staging areas and construction site for use, as needed.</li><li>• Staging areas where refueling, storage, and maintenance of equipment occur</li></ul>	City of Chowchilla/Project Contractor	City of Chowchilla/Project Inspector	

	<p>shall not be located within 100 feet of drainages to reduce the potential for contamination by spills.</p> <ul style="list-style-type: none"><li>• Construction equipment shall be maintained and kept in good operating condition to reduce the likelihood of line breaks or leakage.</li><li>• No refueling or servicing shall be done without absorbent material (e.g., absorbent pads, mats, socks, pillows, and granules) or drip pans underneath to contain spilled material. If these activities result in an accumulation of materials on the soil, the soil shall be removed and properly disposed of as hazardous waste.</li><li>• If a spill is detected, construction activity shall cease immediately, and the procedures described in the Spill Prevention and Contingency Plan will be immediately enacted to safely contain and remove spilled materials.</li><li>• Spill areas shall be restored to pre-spill conditions, as practicable.</li><li>• Spills shall be documented and reported to Madera County and appropriate resource agency personnel.</li></ul>			
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<b>MM HAZ-2</b>	An encroachment permit, approved by the County Department of Public Works, will be required to cut trenches in the County's right of way. As a part of the encroachment permit, a traffic control plan will be submitted to the County Public Works Department.	City of Chowchilla/Project Contractor	City of Chowchilla/Project Inspector	
<b>Hydrology</b>				
<b>MM HYD-1</b>	Implement Sedimentation and Erosion Control Measures, which includes drainage control and the installation and implementation of Best Management Practices (BMPs), including straw bales, coir rolls, hydro seeding, etc., in areas of bare soil, and in drainages near all areas of disturbance during construction of the proposed Project and would therefore reduce potential impacts to less than significant. BMPs for control of erosion are required as part of Madera County's grading and building permits to reduce erosion of soils on the proposed Project site. The requirements of the State General Construction Stormwater Permit will require a Stormwater Pollution Prevention Program (SWPPP) because area of impact would be greater than one acre. With the incorporation of Mitigation Measure HYD-1, potential erosion and sedimentation impacts are considered less than significant.	City of Chowchilla/Project Contractor	City of Chowchilla/Project Inspector	
<b>Noise</b>				

<b>MM NSE-1</b>	<p>Madera County shall incorporate the following BMPs to minimize noise impacts during construction activities:</p> <ul style="list-style-type: none"><li>• Construction shall be limited to daytime hours between 7:00 a.m. and 7:00 p.m Monday through Friday and 9:00 a.m. and 5:00 p.m. on Saturdays.</li><li>• All construction equipment shall be equipped with sound-control devices no less effective than those provided on the original equipment. Equipment shall have a muffled exhaust.</li><li>• Appropriate additional noise-reducing measures will be implemented, including but not limited to:<ul style="list-style-type: none"><li>○ Changing the location of stationary construction equipment when practical; and</li><li>○ Shutting off idling equipment.</li></ul></li><li>• If construction activities are required outside of the daytime working hours described above, Madera County shall notify residents 48 hours in advance. If after-hour construction is required due to an emergency, Madera County will notify nearby residents immediately.</li></ul>	City of Chowchilla/Project Contractor	City of Chowchilla/Project Inspector	
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**APPENDIX B**  
**PROJECT REPORT**

**FINAL**

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# **CITY OF CHOWCHILLA PROJECT REPORT**



**June 2020**

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FINAL

## PROJECT REPORT

**Prepared for:**

City of Chowchilla  
130 S. Second Street  
Chowchilla, CA 93610  
Phone: (559) 665-8615

**Consultant:**



2816 Park Avenue  
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June 2020

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## Appendices

Appendix A – City of Chowchilla Wastewater Collection System Map

Appendix B – Water Model Printouts for Scenario 2 and Scenario 4

Appendix C - Project Alternative Cost Estimates

## SECTION I - INTRODUCTION

### 1.1 - Background Information

The City of Chowchilla recently received a Clean Water State Revolving Fund (CWSRF) planning grant from the State Water Resources Control Board (SWRCB). The purpose of the grant and associated planning study is to explore the possibility of the City of Chowchilla providing wastewater collection and treatment services to Madera County Maintenance District 33 (MD-33), also known as Fairmead. The town of Fairmead includes approximately 175 potential residential connections, Fairmead Elementary School, and a commercial property, all of which are currently connected to local individual septic systems. There is no central wastewater collection system or treatment facility for the approximately 1,447 residents (2010 census) of Fairmead.

Due to the aging infrastructure, increasingly stringent wastewater discharge requirements, and the generally economic disadvantaged population, this grant and assessment report will serve as the basis for any future funding opportunities for construction of wastewater system improvements in Fairmead and the City of Chowchilla's collection and/or treatment systems. The report will provide an inventory of the City's existing wastewater system components, and a condition assessment that will consider age, condition, and capacity of the existing elements.

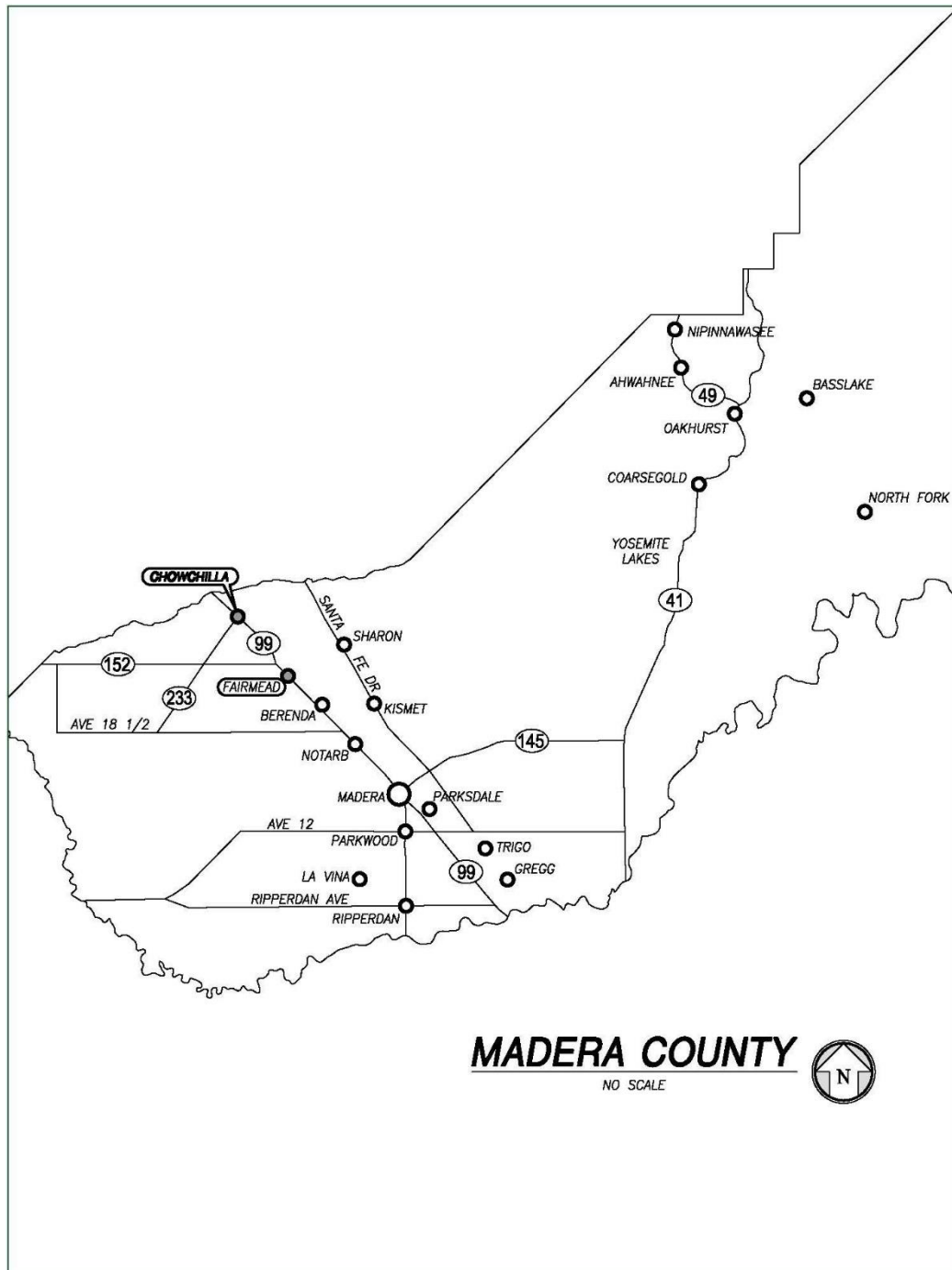
In order to perform this assessment, the gravity collection system maps will be updated and imported into both water modeling software and a Geographic Information System (GIS) platform usable by the City. The model will be used to simulate average and peak flows of both the existing and projected system and to evaluate the impact of connecting MD-33 to the City's system. It will include field surveying of manholes and pipe inverts to complete missing information in the existing maps. It will also include installing sewer monitoring equipment in a manhole to gather wastewater flow trends and to confirm data generated by the model.

The City of Chowchilla is in the Central Valley in Madera County, California, approximately 15 miles north of the City of Madera and 18 miles south of Merced along State Highway 99. Land uses within the City limits are primarily residential and industrial with some commercial. The city is surrounded by agriculture.

Wastewater produced within the City of Chowchilla is collected by a gravity sewer system. The system includes four lift stations that, together with gravity pipes, direct the wastewater to an existing wastewater treatment plant (WWTP) owned and operated by the City of Chowchilla. The WWTP is located at 15750 Avenue 24 ½ in the southern end of the City which is approximately 2.5 miles west of State Highway 99. A comprehensive map of the sewer collection system can be found in Appendix A.

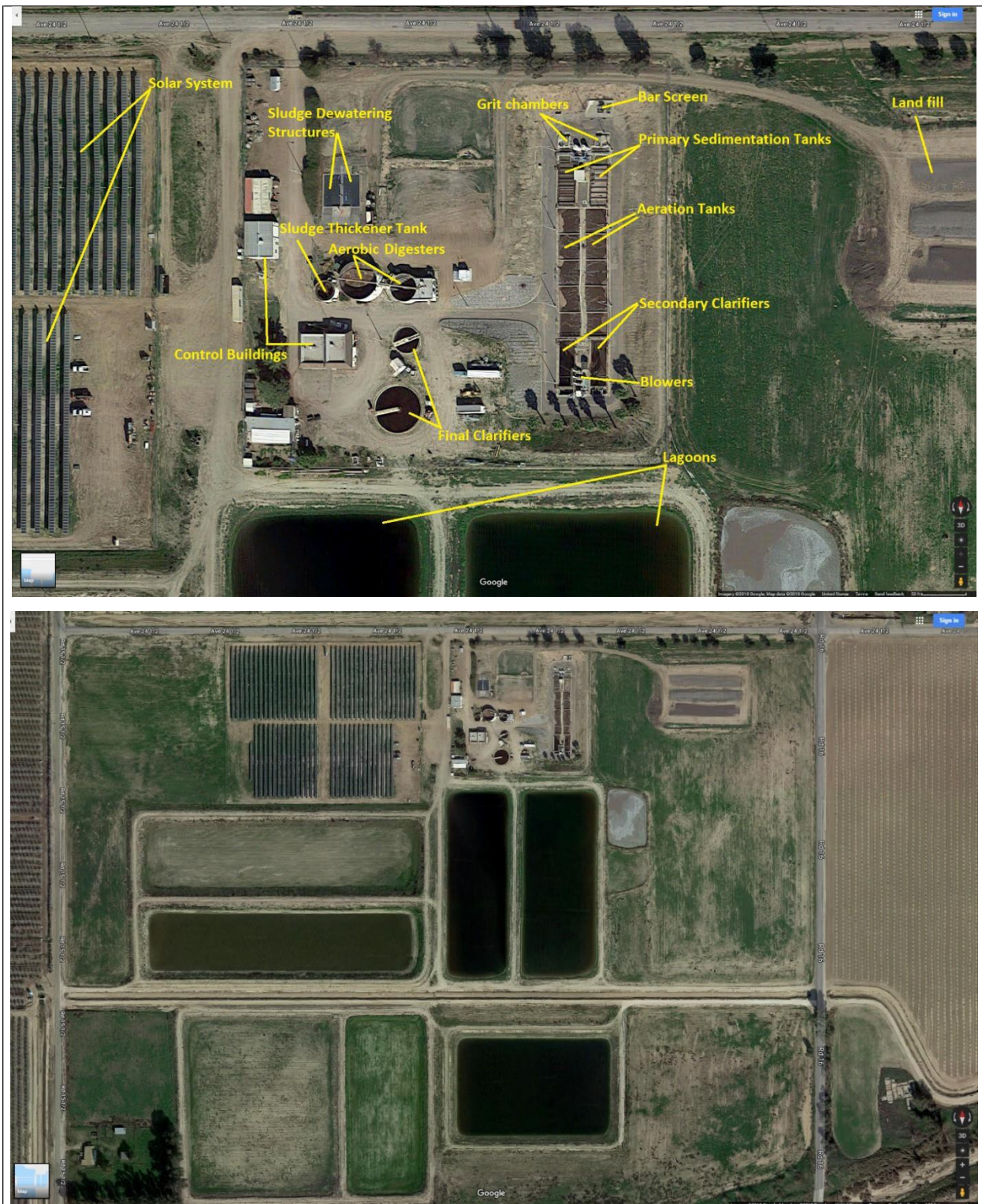
### 1.2 - Population

According to the 2000 and 2010 US Census Bureau data, the population of the City of Chowchilla was 11,127 and 18,720, respectively, and 1,222 and 1,447 for Fairmead. The population growth rates can be calculated using the formula:  $[(\frac{initial}{final})^{\frac{1}{y}} - 1] \times 100$ . Chowchilla's growth rate was calculated to be 5.34% per year and Fairmead's growth rate was calculated to be 1.70%. A portion of the Chowchilla population comes from the prison, but more than 50% are permanent residents.



**Figure 1-1  
Vicinity Map**





**Figure 1-2**  
**Wastewater Treatment Plant Layout**



## **SECTION II - WASTEWATER TREATMENT PLANT**

### **2.1 - Existing Facilities**

The majority of the Chowchilla WWTP was constructed in 1967 and included grit chambers, primary and secondary treatment clarifiers, final clarifiers, sludge bed embankments, a 30-foot diameter anaerobic digester, and a laboratory room. However, some of the components were existing prior to 1967 meaning some of the components are over 50 years old. These older components include one of the final clarifiers, the sludge thickener tank, a digester tank, a small control room, and some additional small components. There was also a filter tank which was removed during the plant's first upgrade in 1977.

Several modifications were made during the year of 1977 including the replacement of screw pumps with air operated slurry pumps, the reconstruction of existing sludge lagoons, the conversion of the existing anaerobic digester into an aerobic digester, and the replacement of one clarifier with an additional 41-foot diameter aerobic digester. Additionally, the laboratory room was converted to a blower room, the rock filter was removed, and a new laboratory and control building was constructed.

The plant was updated again in 1995 with the addition of a bar screen to the preliminary treatment system, the filling of two sludge bed embankments, the reconstruction of the sludge lagoons, and the addition of a sludge dewatering structure and a control building. In 2006, new lagoons were constructed, and the old sludge lagoons were inactivated. In 2018 a solar electricity system was installed.

Currently, the WWTP's existing facilities include a pretreatment screen, grit chambers, primary and secondary sedimentation clarifiers equipped with chain scrapers, aeration clarifiers, three blowers, seven lagoons, two digestion tanks, sludge dewatering beds, several pumps, as well as power generators. See Figure 1-2 for the layout of the existing plant. The treatment plant was designed for a treatment capacity of 1.8 million gallons per day (MGD) and currently treats approximately 0.80 MGD during dry weather conditions (July 2018) and an occasional peak flow of 1.1 MGD during wet weather conditions (March 2018). This correlates to the plant utilizing around 50% of its design capacity, leaving 50% available. The plant's treatment process is recorded, monitored, and logged daily and flow data from June of 2017 through August of 2018 is summarized in Table 2-1 below.

The majority of the influent comes from residential connections with some from commercial and industrial uses. The original plant included separate inlets for residential and industrial waste streams; however, all waste currently comes into the plant together. There is potential to separate these lines in the future once there is more industrial development. The City could then dedicate separate treatment trains for the different influents and tailor each treatment process as needed. At this time, the industrial waste coming into the plant causes minimal change in the wastewater make-up and the existing plant is able to handle these fluctuations.

**Table 2-1 Wastewater Treatment Plant Flows: July 2017 – August 2018**

<b>Month</b>	<b>Max. Flow (MGD)</b>	<b>Avg Flow (MGD)</b>	<b>Total Flow (MG)</b>
Jul-2017	0.98	0.90	27.76
Aug-2017	1.01	0.93	28.74
Sep-2017	1.01	0.93	27.82
Oct-2017	0.97	0.91	28.28
Nov-2017	1.00	0.91	27.39
Dec-2017	0.96	0.91	28.19
Jan-2018	1.01	0.87	26.85
Feb-2018	0.88	0.81	22.61
Mar-2018	1.12	0.87	26.96
Apr-2018	0.90	0.84	25.30
May-2018	0.87	0.80	24.85
Jun-2018	0.86	0.80	23.90
Jul-2018	0.85	0.81	25.19
Aug-2018	0.87	0.81	25.14
<b>Total Annual Flow</b>			<b>312.47 MG</b>
<b>Average Daily Flow</b>			<b>0.86 MGD</b>

**Note: Data from City of Chowchilla Monitoring and Reporting Program Test Sheets provided by City.**

## 2.2 - Treatment Process and Condition of Facilities

### Process Overview

The process of the Chowchilla WWTP is primarily to reduce biological oxygen demand (BOD) content, total organic carbon (TOC), and total suspended solids (TSS) from the wastewater influent. The treatment is based on an activated sludge process which is a secondary treatment system split into two phases, a mechanical phase and a biological phase. The plants current processes include preliminary screening and grit removal, primary clarification, aerobic sludge digestion, solids dewatering, a two-stage biological nutrient removal process with internal recycling, and secondary clarification with return activated sludge. The treated effluent is discharged to ponds where it evaporates into the atmosphere

and percolates into the ground. The discharge procedure is closely monitored by several state regulatory agencies to guarantee compliance with both state and federal mandates. See Table 2-2 for a brief summary of recent wastewater influent and effluent characteristics.

**Table 2-2 Influent and Effluent Characteristics: July 2017 – August 2018**

Month	Average Ph		Average Electrical Conductivity	
	Influent	Effluent	Influent	Effluent
Jul-2017	7.67	7.08	651	412
Aug-2017	7.74	7.27	675	440
Sep-2017	7.42	6.94	577	376
Oct-2017	6.70	6.29	82	49
Nov-2017	7.06	6.51	66	43
Dec-2017	6.70	6.38	65	42
Jan-2018	6.63	6.40	589	403
Feb-2018	7.31	6.47	722	448
Mar-2018	7.67	6.72	769	460
Apr-2018	7.71	6.81	808	535
May-2018	7.67	7.14	819	531
Jun-2018	7.60	7.20	751	504
Jul-2018	7.62	7.32	769	582
Aug-2018	7.66	7.38	806	565

**Notes:** Data from City of Chowchilla Monitoring and Reporting Program Test Sheets provided by City.

### Preliminary Treatment

The Chowchilla WWTP is fed by a gravity pipe which directs wastewater through a bar screen that removes large floating objects such as sticks, leaves, and trash that could potentially clog or damage subsequent pipes and equipment (Figure 2-1). The wastewater then flows to a splitter box, which divides the flow into two grit chambers. The velocity of the wastewater is adjusted to allow sand and grit to settle out and be removed by pumps. The materials removed by this process and the screening process are de-watered and discharged to a dumpster for transport to a landfill.



**Figure 2-1 Bar Screen**

The self-cleaning bar screen is in fair condition. However, one complaint is that the bar screen openings are too large (1/2") and have contributed to the passthrough of solids that eventually plug openings in the baffle plates in the primary clarifiers. In addition, the bar screen is operating near capacity and if any additional flow is introduced into this plant, an additional bar screen would need to be installed. The grit chambers are in decent condition and are maintained by manual cleanings every two to three months.

#### Primary Treatment

The primary treatment process takes the wastewater flow from the grit chambers into primary, or sedimentation clarifiers (Figure 2-2). The flow is slowed down further allowing suspended solids to settle to the bottom to form sludge with the oils and grease rising to the surface. The oils and grease are skimmed off and chain scrappers mechanically drive the sludge along the bottom to the center of the clarifier towards a hopper where it is pumped to the sludge treatment facilities. Currently, the skimmers and scrapers are missing flights which impede the process and the timers for the sludge pumps do not work. Staff has had to perform manual pumping as needed and is not automatic.



**Figure 2-2 Surface Skimmers and Primary Clarifiers**

The primary clarifiers are part of the original plant and thus are 51 years old. Despite their age, these tanks are functioning well. In addition, the portions of the concrete structure surrounding the tanks that are exposed at the surface are in good condition. Unfortunately, the mechanical parts of the clarifiers are showing their age. It is recommended that the chain scrapers' wheels and motors be thoroughly inspected and rehabilitated as necessary.

It should also be noted that each of the two treatment trains are designed for half of the 1.8 MGD design treatment capacity. This means when one side is taken offline for maintenance, the plant is only capable of treating 0.9 MGD which is below the average flow during most months of the year. The City has expressed a desire to expand the plant simply to allow for maintenance of the various components. Any additional flows due to development or the connection of Fairmead would make this maintenance problem even more difficult to handle.

### Secondary Treatment

After primary treatment most of the physical contaminants have been removed, however the wastewater still contains biological contaminants and suspended solids. A secondary biological treatment called the activated sludge process is used within the Chowchilla WWTP. The activated sludge process includes mixing wastewater and sludge solids that are formed from the sludge produced in the primary treatment phase. In the aeration tanks (Figure 2-3), three blowers (Figure 2-4) inject air to oxygenate the liquor providing a thriving habitat for the sludge microorganisms. As the microorganisms and air mix with the organic material in the wastewater, the microorganisms feed off of the organics and



grow in size. The microorganisms continue to grow and clump together, or flocculate creating what is known as activated sludge.



**Figure 2-3 Aeration Tanks**



**Figure 2-4 Blowers**

Due to leaks in the main air line and old, inefficient diffusers, the capacity of each train is significantly reduced. Based on existing conditions, the operators have limited the flow to approximately 0.3 MGD to the east train and 0.5 MGD to the west train, allowing the basins a longer aerated detention time.

The liquor flows out of the aeration tanks and into secondary clarifiers. The secondary clarifiers use the same method as the primary clarifiers with mechanically driven chain scrapers. The speed of flow is reduced allowing the activated sludge to settle to create raw primary biosolids. The biosolids are removed by pumping and disposing of in a landfill. The treated wastewater is pumped from the secondary clarifiers to two round tanks, final clarifiers, which allow for additional gravity settlement (Figure 2-5). From the final clarifiers, the effluent is pumped to lagoons, where the water evaporates into the atmosphere and percolates into the groundwater.

The aeration tanks and secondary clarifiers are functioning well. However, the mechanical parts of the clarifiers need to be checked thoroughly and rehabilitated as necessary. The exterior concrete structures around these tanks are also in good condition. Furthermore, the two 50-foot and 30-foot final clarifiers are operating effectively.



**Figure 2-5 Final Clarifier**

The lagoons are in good condition and are operating at capacity. If the flows to the WWTP are increased, more lagoons will need to be constructed. The plant currently has approximately 30-40 acres available to construct additional lagoons, if needed.

## Digestion, Dewatering, & Disposal

The activated sludge produced by secondary treatment along with the sludge produced by primary treatment are sent to the plant's 30-foot diameter primary digester. Digestion occurs in the primary digester for 15 days before the sludge is moved to the 41-foot diameter secondary digester. The solids removed from the second digester is piped to dewatering beds. Dewatering is a mechanical process where additional water is removed from the biosolids. At the Chowchilla WWTP, this is typically achieved with two tile-lined drying beds. The tile system works well in dry weather, but during the wet months, the sludge must be pumped to a small pond where it temporarily sits until dry weather. This is not ideal, as the sludge has to be moved and weather has to be monitored on a regular basis to ensure proper placement of sludge. Once the sludge is dried, the City then pays to dispose of the final biosolids.

The two above-ground uncovered aerobic digesters are part of the original construction of the plant making them over half a decade old. The piping system and valving needs to be checked and rehabilitated as needed. Additionally, the entry hatches and safety equipment for these digesters need to be upgraded to conform to current standards. It is recommended that the tanks be drained, and the interiors be inspected for deterioration. The tank entry equipment is also in need of safety improvements and upgrades. The sludge dewatering beds have been well maintained and are in good condition. The sludge pumping system is also in good condition and appears to be functioning well.

## Existing Building Structures, Controls, and Electrical

The Service Building was added during the 1977 modification and includes a workshop, a laboratory, a staff room, and a restroom. The control panels in the control building do not work. According to City staff, the conduit from the plant trains has collapsed and the signals have been lost from all plant equipment at the trains. Staff has to visually check every pump, motor, and drive to ensure they are functioning properly. Staff is currently working with a technician to install a panel that will show the flow meters output in the control building. In addition, the laboratory tools need to be inspected and additional equipment be provided as required.

There is a backup power generator onsite, but it currently only serves the buildings and not any of the treatment equipment at the trains. In 2018, the City installed solar panels to supply power to the plant and is operating as designed.

## 2.3 – Wastewater Quality and Reuse

The City currently meets the Waste Discharge Requirements (WDR) outlined in their discharge permit and does not have any open wastewater-related violations or citations. The WDRs require monitoring of Biochemical Oxygen Demand (BOD), Total Suspended Solids (TSS) and Settleable Solids (SS) with maximum monthly averages at the levels shown in Table 3-6.

**Table 2-3 WDR Monitoring Requirements for Chowchilla WWTP**

Constituent	Maximum Monthly Level
BOD	40
TSS	40
SS	0.02



The WWTP site lies within the Madera Hydrologic Area (No. 545.20) in the San Joaquin Valley Floor Hydrologic Unit. There is currently no recycling or reuse of the discharged water other than natural replenishing of groundwater supplies from percolation ponds.

## 2.4 – WWTP Evaluation

The City of Chowchilla WWTP has serviced the community for over 51 years. City staff has done a remarkable job of keeping the plant well maintained throughout the years. However, there are a variety of infrastructure concerns with the aging facility and obsolete equipment.

Primary needs and concerns are summarized as follows:

- The existing bar screen does not perform adequate solids removal.
- Wheels, motors, and flights of primary and secondary clarifiers' chain scrapers need to be replaced.
- The timers on the sludge pumps do not work.
- The main air transmission line is leaking, and diffusers are old and of an obsolete design.
- The blowers' valves and motors need to be inspected and rehabilitated as necessary.
- Digester entry hatches and ladder need to be upgraded to conform to current standards.
- The interior of the digesters needs to be inspected and rehabilitated as necessary.
- Tile-lined drying beds do not allow for drying sludge during wet months.
- The existing controls for the treatment train equipment no longer work.
- Gauges are near or beyond their useful life and need to be replaced.

There are also a few items that would need to be addressed if the plant was to take in additional wastewater. Additional treatment trains or improvements to the existing system would need to be constructed to allow for additional capacity and the ability to take one train offline for maintenance. Additionally, new lagoons would need to be constructed to increase overall discharge and to hold the treated water as it percolates and evaporates.

## SECTION III - SANITARY SEWER COLLECTION SYSTEM

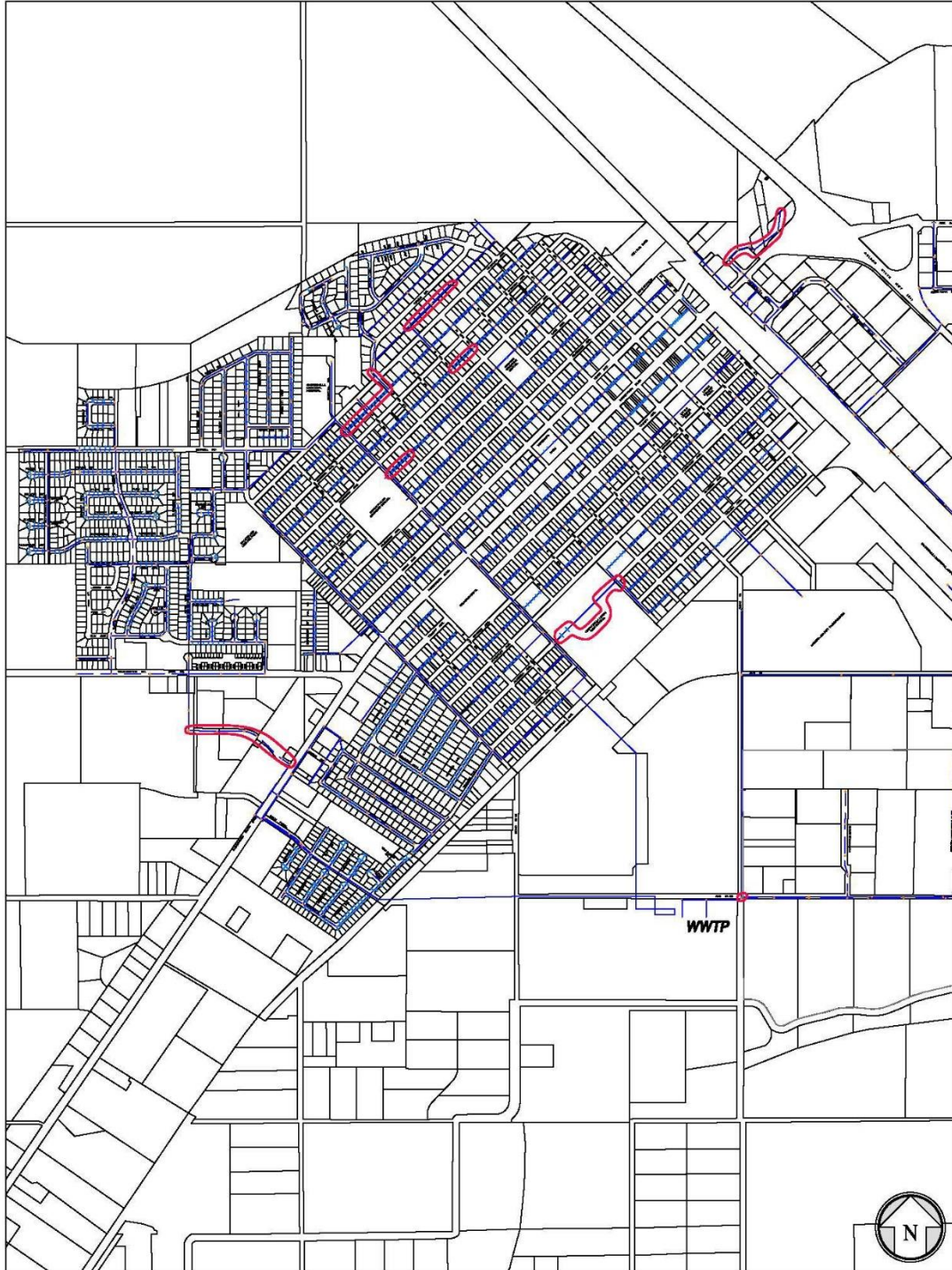
### 3.1 – Summary of Existing Facilities

The City owns, operates, and maintains the sewer collection system serving the community through approximately 35 miles of gravity sewer mains and force mains, ranging from 6" to 24" diameter, approximately 4,434 sewer lateral connections, hundreds of sewer manholes, and four lift stations. The lift stations are named by their street location, as follows: Amador, Howell, 11th Street, and Palm. The four lift stations are monitored by Pro-Tech Security & Electronics and include a cellular dial-out for a high-water alarm situation.

### 3.2 – Gravity Collection System

During a site walk on November 6, 2018 with Joseph Roman, City of Chowchilla Public Works Supervisor, known problem areas in the collection system were identified. City staff needs to occasionally flush these lines due to buildup of either grease and/or rags which then cause the sewer lines to back up into upstream manholes and in some cases into customers' service laterals and ultimately through floor drains. The known problem areas are listed below and are identified in Figure 3-1.

- 8" sewer main located between the lots between Circle Drive and Ventura Avenue from Fifth Street to Seventh Street
- 8" sewer main starting in Ninth Street at Ventura Avenue and then in the alley between Ventura Avenue and Sonoma Avenue to Eleventh Street
- 8" sewer main in the alley between Monterey Avenue and Lake Avenue, from Tenth Street to Eleventh Street
- 8" sewer main in the alley between Monterey Avenue and Sonoma Avenue, from Sixth Street to Seventh Street
- 15" and 12" sewer mains in Meyer Street from Kites Way to Robertson Blvd. This area is usually blocked due to a build-up of grease in the line.
- 10" sewer main that runs through the Chowchilla High School campus. The school recently constructed a new building which required rerouting of the sewer main. This lessened the slope of the pipe which reduces the velocity of the flow which enables solids to settle out and create blockages in the pipe. The school will occasionally get odor complaints from students or faculty which then triggers a call to City staff, who then comes to flush the lines, clearing any blockages.
- 6" sewer main from the end of the line at Farnesi's Steakhouse to Chowchilla Blvd. The problem is usually a grease blockage and is likely due to the several businesses that prepare food that tie into this line. It is unknown if any of these businesses own a grease trap or if they properly maintain it.
- Short length of 10" sewer pipe connecting the 24" domestic trunkline and the 18" industrial trunkline near the intersection of Avenue 24 ½ and Road 16.



**Figure 3-1**  
**Known Collection System Problem Areas**





### 3.3– Lift Stations

#### Amador Lift Station

The Amador lift station is a duplex pump setup with a wet well only. There is no trash rack or solids filtering system and is currently without a permanent lockable lid. It is temporarily covered with a sheet of plywood. There is also a pump pulling winch and electrical controls within the fenced area. The site has a connection point for a backup generator, but there is currently no generator onsite. There is also no bypass piping that would prevent a Sewer System Overflow (SSO) in the event of high water in the lift station.

The wet well chamber concrete is generally in good condition and does not need repair at this time. Historically, the City has had issues with build-up of rags at this lift station, however the lead pump was upgraded within the last 6-8 months to a cutting style impeller. This has dramatically improved the performance of this lift station and they had yet had any high-water alarms at this location since the pump was replaced.

Pump data was not available for this lift station, but it has historically been able to keep up with the seasonal fluctuations of flow in the system.



**Figures 3-2 and 3-3 Amador Lift Station  
Pump Hoist with Hand Winch (left), Plywood Pump Chamber Cover (right)**





**Figure 3-4 Amador Lift Station Wet Well**

#### Howell Lift Station

The Howell lift station is very similar to the Amador lift station. It is a single chamber wet well, duplex pump station with an ultrasonic level sensor and alarm dial-out with a high-water alarm. The components appear to be in good condition and there are currently no complaints about the operations, other than there is no backup power supply for the lift station, nor is there a connection for one.



**Figure 3-5 Howell Lift Station**



**Figure 3-6 Howell Lift Station Wet Well**

Pump data was not available for this lift station, but it has historically been able to keep up with the seasonal fluctuations of flow in the system. However, there is no bypass piping that would prevent an SSO in the event of high water in the lift station.

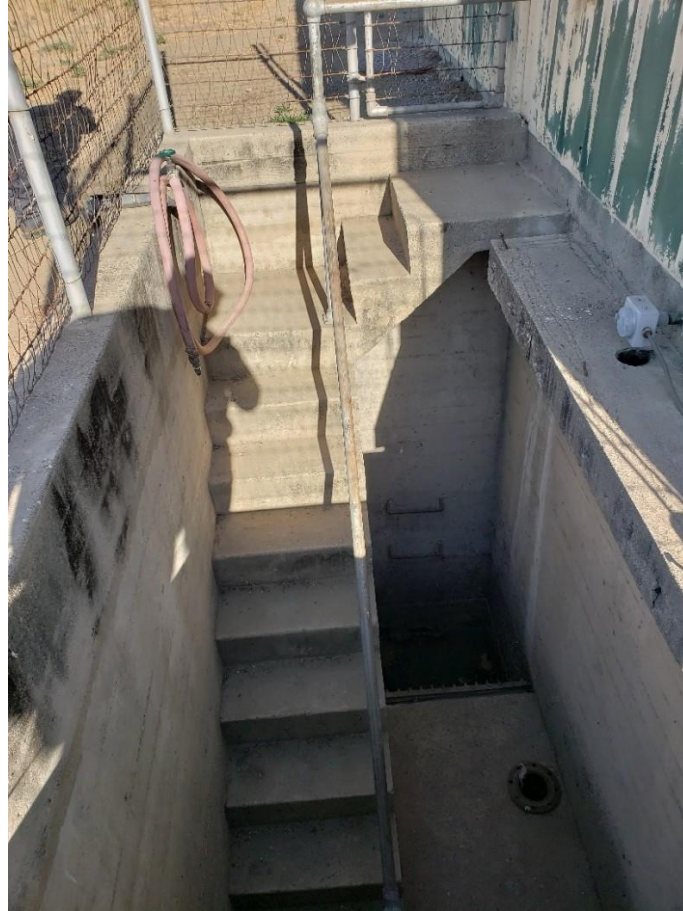
#### Eleventh Street Lift Station

The Eleventh Street lift station is the City's first lift station and is still in operation. There have obviously been modifications over the years, specifically with the pumps and backup power. The influent passes through a trash rack and then goes into wet well chamber. There is also a dry well chamber that houses the three pumps, two submersible and one vertical turbine driven by a drive shaft from above. City staff reports having to backflush the pumps a couple times a week due to build-up of rags in the pumps. There have also been issues with the level transducer not detecting the water level correctly.

The backup power source is no longer connected to any of the pumps but the diesel motor is still in the lift station shelter. The site has a connection point for a backup generator, but there is currently no generator onsite.

Pump data was not available for this lift station, but it has historically been able to keep up with the seasonal fluctuations of flow in the system. However, there is no bypass piping that would prevent an SSO in the event of high water in the lift station.

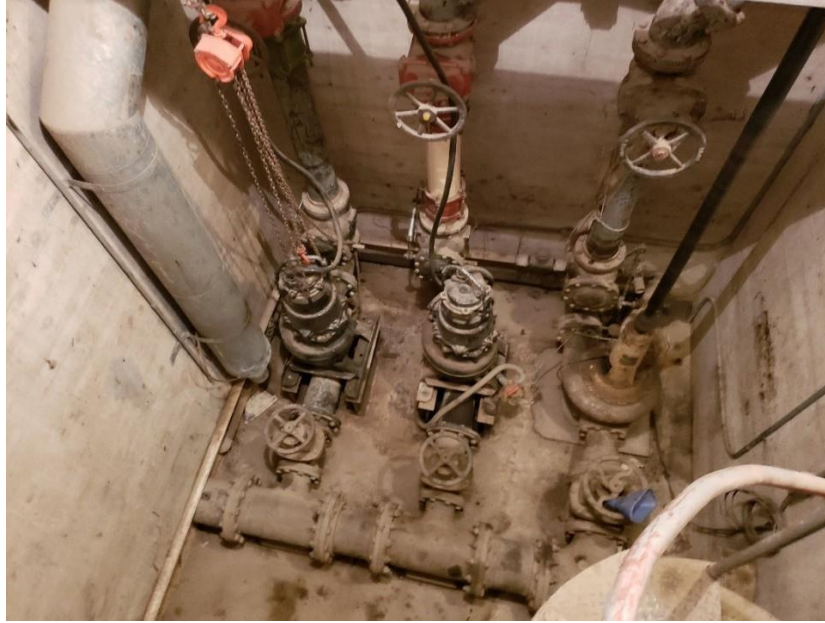




**Figure 3-7 Eleventh Street Lift Station Wet Well and Lower Access**



**Figure 3-8 Eleventh Street Lift Station Upper Level  
with Backup Diesel and Vertical Turbine Motor**



**Figure 3-9 Eleventh Street Lift Station Dry Well Pump Chamber**

#### Palm Lift Station

The Palm lift station is a Smith & Loveless, Inc. package lift station which includes a below-ground dry well that houses the pumps. The wet well is located outside the fencing and is generally in good condition. The City has expressed problems with rags in the pumps and air leaks and clogs in the existing bubbler system for the level control which causes issues with the on/off functionality of the lift station. The site has a connection point for a backup generator, but there is currently no generator onsite. Also, there is no bypass piping that would prevent an SSO in the event of high water in the lift station.



**Figure 3-10 Palm Lift Station, Wet Well Chamber Visible Outside Fence**





**Figure 3-11 Palm Lift Station – Smith & Loveless, Inc. Package Pump Station**

A summary of the deficiencies related to the existing lift stations are as follows:

- None of the existing lift stations have a backup power source.
- The hatch at the Amador Lift Station needs to be replaced.
- Palm lift Station pumps frequently clog due to rags
- Existing bubbler level control system at the Palm Lift Station has air leaks and frequently clogs, preventing proper on/off operation of the lift station.
- None of the existing lift stations have an emergency bypass in the event of an overflow.

### 3.4 – Inflow and Infiltration

Inflow and Infiltration (I&I) is a phenomenon that affects every sewer collection system. When it rains, a certain amount of the runoff finds its way into manholes and adds to the wastewater flow. Groundwater infiltration is another process that is difficult to prevent. Similar to the rain runoff, groundwater will eventually penetrate components such as pipe joints, fittings, lift stations, and manholes. Based on the condition of the system components, the I&I could range from negligible to very significant. For Chowchilla, we can examine the wet and dry season flows at the plant and draw some conclusions. Assuming wastewater flows from the service connections remains constant throughout the year, the I&I can be estimated by calculating the difference in flows between the wet and dry seasons.

Wet Season Monthly Average (November - April) = 0.862 MGD

Dry Season Monthly Average (May – October) = 0.850 MGD

Estimated I&I = 1.37 %

Typically, values are higher than this, and it is likely offset by larger industrial flows during the summer. Since there is no sewer flow monitoring throughout the system, we cannot assume this minimal difference is all the I&I that the system is taking in. Ideally, the actual flows would be monitored year-round at various locations in the system to better calculate the I&I. A comprehensive TV inspection of the pipelines during a wet season would also shed light on any issues with infiltration in the system through pipe breaks, loose joints or manhole defects. The objective for this report is to get some actual flow data but due to the timeline of the project, monitoring seasonal changes will not be feasible.

### 3.5 – Storm and Sanitary Analysis (SSA) Model

#### Model Overview

Sanitary sewer modeling is a complex process that relies on many different sets of data. QK used industry standard modeling techniques, which use actual measured data from field surveys, accepted assumptions, and engineering judgements. Other data used included land use elements from the City of Chowchilla General Plan and measured influent flow records from the City wastewater treatment facility. By calibrating the model results, QK was able to simulate system flows and characteristics that are consistent with actual influent data provided by the City. The following sections summarize the results and methodologies used to create and run the sewer model.

#### Hydraulic Modelling Software

QK used Autodesk Storm and Sanitary Analysis (SSA) 2018 software to create and run a computer model of the Chowchilla wastewater collection system. SSA is a computer modelling software that can fully integrate sewer facility and survey information stored in AutoCAD drawings to produce a system model. AutoCAD information used to create the sewer model can include spatial and elevation data of sewer pipes, pipe inverts manhole locations, lift station locations, and lift station volume capacities. The system model created from these inputs is a fully hydrodynamic simulation model capable of modelling and accessing existing and future flows for sewer or storm drainage systems.

#### Hydraulic Modelling Data

##### *Sewer Facilities*

The City provided QK with pdf providing general horizontal location, sizing, and invert data for pipes and manholes in the existing wastewater collection system. QK staff then used this information to generate a sewer pipe network in AutoCAD that reflected the physical locations and conditions of the system. QK then performed additional field survey to obtain missing or additional facility information that would be used to further refine and validate pipe network drawing in AutoCAD. Once the sewer pipe network was completed, the pipe network data was imported into SSA 2018 to create the sewer facilities and structures that would comprise the hydraulic model.

##### *Sewer Lift Stations*

The City provided location data on 4 existing sanitary sewer lift stations. However, no pump or volume capacity criteria was made available. For purposes of the hydraulic model, the lift stations were modelled as standard junction nodes with generic pumps to pass whatever influent is entering the lift station. This is in harmony with City staff comments that there have not been any issues with the lift

stations keeping up with current flows. This should be reevaluated as growth occurs, as the pumps may need to be upsized to prevent surcharging any upstream pipes.

#### *Sewer Loading Values*

The SSA model simulates fluid flows in the network based on user defined values that are input into the modelled facilities. QK manually calculated and distributed loading values based on the General Plan land use designations (See Figure 3-12), acreage, and established use factors for the designated land use classification. Land use, acreage, and calculation factors have been provided in Table 3-1. Once the flows were calculated, we applied a calibration factor of 0.56 for the existing system, derived from the actual treatment plant influent data to correlate model loading values to real world operational characteristics of the system and to account for any underutilized land in the City. Modeling of Fairmead and future flow rates in Chowchilla are not affected by the calibration factor and are based solely on the loading rates in Table 3-1. Once these values were calculated and input, the model ran calculations utilizing the St. Venant equation to determine flow characteristics for each component in the model.

#### *Fairmead*

In a report completed by Stantec in 2015, several alternatives were considered for addressing the sewer concern in Fairmead, some of which were repair of individual septic systems, creation of a treatment facility local to Fairmead, and consolidation with Chowchilla. The option to connect to Chowchilla's system was found to be the most favorable for various reasons. This model will simulate the Fairmead connection at two locations for evaluation. One tie-in location is at the large 24" domestic gravity trunkline located in Avenue 24 ½ coming from the Green Hills development. The other tie-in is at the 18" Industrial trunkline, also in Avenue 24 ½. The loading rates for Fairmead will be the same as for Chowchilla and will be based on the land uses designated within the District boundary. See Figure 3-13 for the land use designations in Fairmead.

#### *Model Scenarios*

User flow inputs, as well as physical component configurations and locations, can be varied or changed to simulate different conditions that may occur in the sewer system. These different operation conditions are performed separately in the model as scenarios. This study was concerned with 4 specific scenarios that would be used to evaluate the proposed addition to the wastewater collection system. The first scenario was the existing conditions which was used to evaluate the current capacity of the system and identify any potential deficiencies that need to be addressed. The second scenario evaluated the existing system operation if Fairmead sewer flows were added in order to determine if the existing system could handle the district connection. The third scenario evaluated sewer loading for the City at full build-out within the City limits. The built-out conditions are based on the projected land use and undeveloped acreage outlined in the land use element of the General Plan. The final scenario simulates the increased loading under future built-out conditions plus the additional flow contributed by Fairmead. Table 3-2 provides a summary of each scenario and their associated conditions.

**Table 3-1 Land Use and Sewage Generation Factor Values**

<b>City Land Use Designation<sup>1</sup></b>	<b>Developed Area<sup>2</sup> (Acres)</b>	<b>Undeveloped Area<sup>2</sup> (Acres)</b>	<b>Total Area<sup>2</sup> (Acres)</b>	<b>Land Use Loading<sup>3, 4</sup> (gpd/AC)</b>
Low Density Residential	0.0	0.0	0.0	750
Medium Density Residential	606.4	884.5	1,490.9	1,000
Medium High Density Residential	62.3	241.6	303.9	1,800
High Density Residential	52.3	38.4	90.7	2,250
Service Commercial	104.2	142.2	246.4	1,000
Neighborhood Commercial	0.0	60.4	60.4	1,000
Community Commercial	0.0	8.5	8.5	1,000
Downtown Commercial	26.9	1.9	28.8	1,000
Service Commercial - Highway	18.4	218.9	237.3	1,000
Mixed Use	0.0	0.0	0.0	800
Medical Arts	1.5	1.3	2.8	800
Public Facility	318.3	122.1	440.4	800
Open Space	0.0	188.5	188.5	-
Community Park	0.0	0.0	0.0	-
Neighborhood Park	6.2	71.9	78.1	-
Golf Course	238.0	17.0	255.0	-
Light Industrial	70.1	415.7	485.8	900
Heavy Industrial	202.4	941.0	1,143.4	1,100
Agriculture	0.0	0.0	0.0	-
<b>Total</b>	<b>1,707.0</b>	<b>3,353.9</b>	<b>5,060.9</b>	

Notes:

1. Land use designations from the City of Chowchilla General Plan.
2. Acreage values calculated from City GIS data.
3. Land use loading factors determined based on industry standard values adjusted for specific application to the City of Chowchilla.
4. Sewer usage from park and golf course areas assumed to contribute a negligible amount to generated sewage flows.

**Table 3-2 Model Scenario Flow Values**

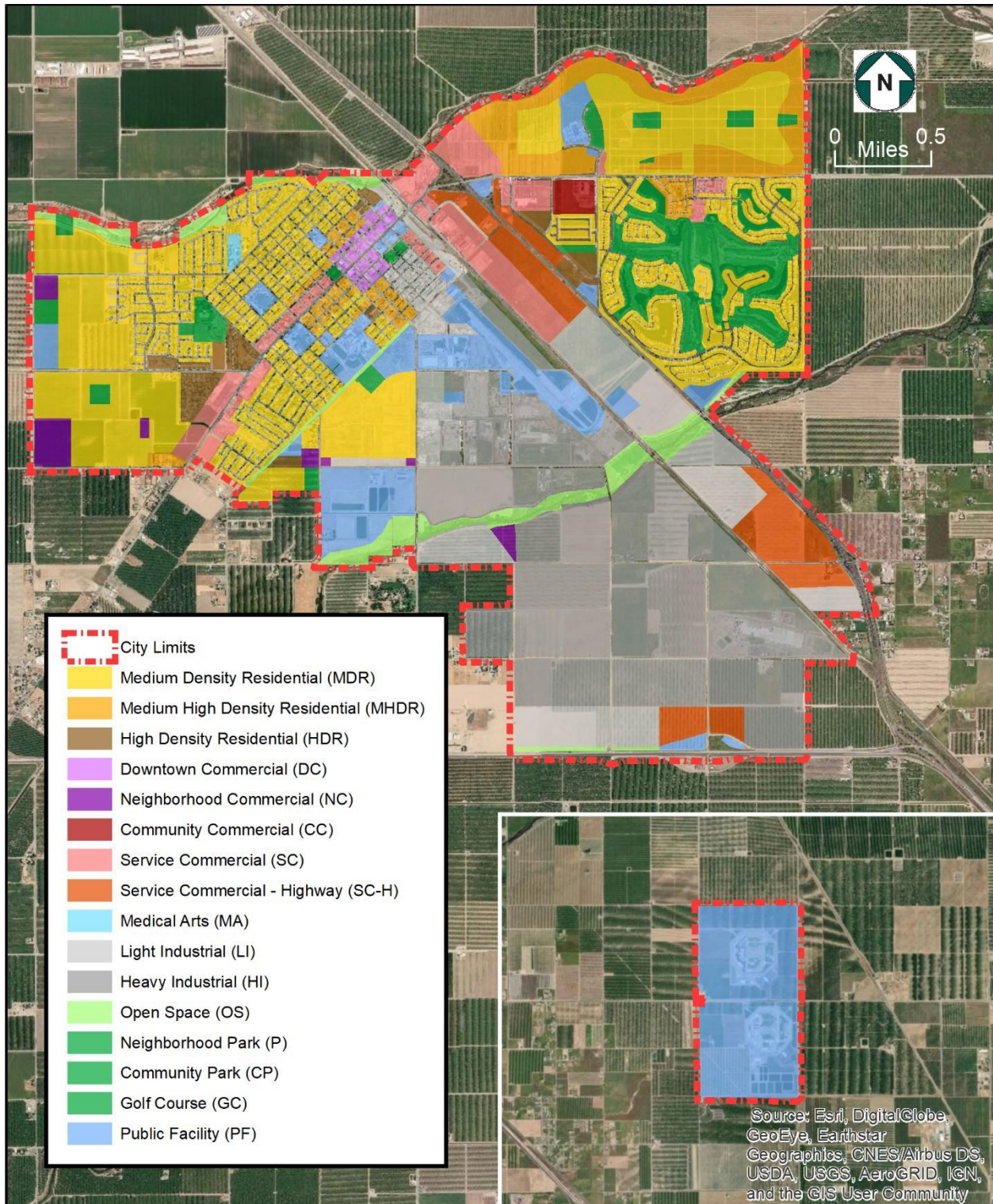
<b>City Land Use Designation<sup>1</sup></b>	<b>Scenario 1 Existing Flows <sup>2</sup> (gpd)</b>	<b>Scenario 2 Existing + MD33 <sup>2,4</sup> (gpd)</b>	<b>Scenario 3 Future Flows <sup>2</sup> (gpd)</b>	<b>Scenario 4 Future + MD33 <sup>2</sup> (gpd)</b>	<b>MD-33 Future <sup>3,4</sup> (gpd)</b>
Low Density Residential	-	102,551	-	102,551	102,551
Medium Density Residential	341,559	493,235	1,490,900	1,642,576	151,676
Medium High Density Residential	63,164	63,164	547,020	547,020	-
High Density Residential	66,281	66,281	204,075	204,075	-
Service Commercial	58,691	58,691	246,400	246,400	-
Neighborhood Commercial	-	1,557	60,400	61,957	1,557
Community Commercial	-	-	8,500	8,500	-
Downtown Commercial	15,152	15,152	28,800	28,800	-
Service Commercial - Highway	10,364	10,364	237,300	237,300	-
Mixed Use	-	-	-	-	-
Medical Arts	422	422	1,400	1,400	-
Public Facility	143,428	146,720	352,320	355,612	3,292
Open Space	-	-	-	-	0.0
Community Park	-	-	-	-	-
Neighborhood Park	-	-	-	-	-
Golf Course	-	-	-	-	-
Light Industrial	35,536	35,536	437,220	437,220	-
Heavy Industrial	125,403	125,403	1,257,740	1,257,740	-
Agriculture	-	-	-	-	-

**Total      860,000      1,119,076      4,872,075      5,131,151      259,076**

Notes:

1. Land use designations from the City of Chowchilla General Plan.
2. Existing Flows adjusted by calibration factor of 0.56 to match average daily flow and to account for underutilized land.
3. Future flows are based on the loading rates established in Table 3-1.
4. Fairmead flow is based on future build-out of Fairmead and the loading rates established in Table 3-1.

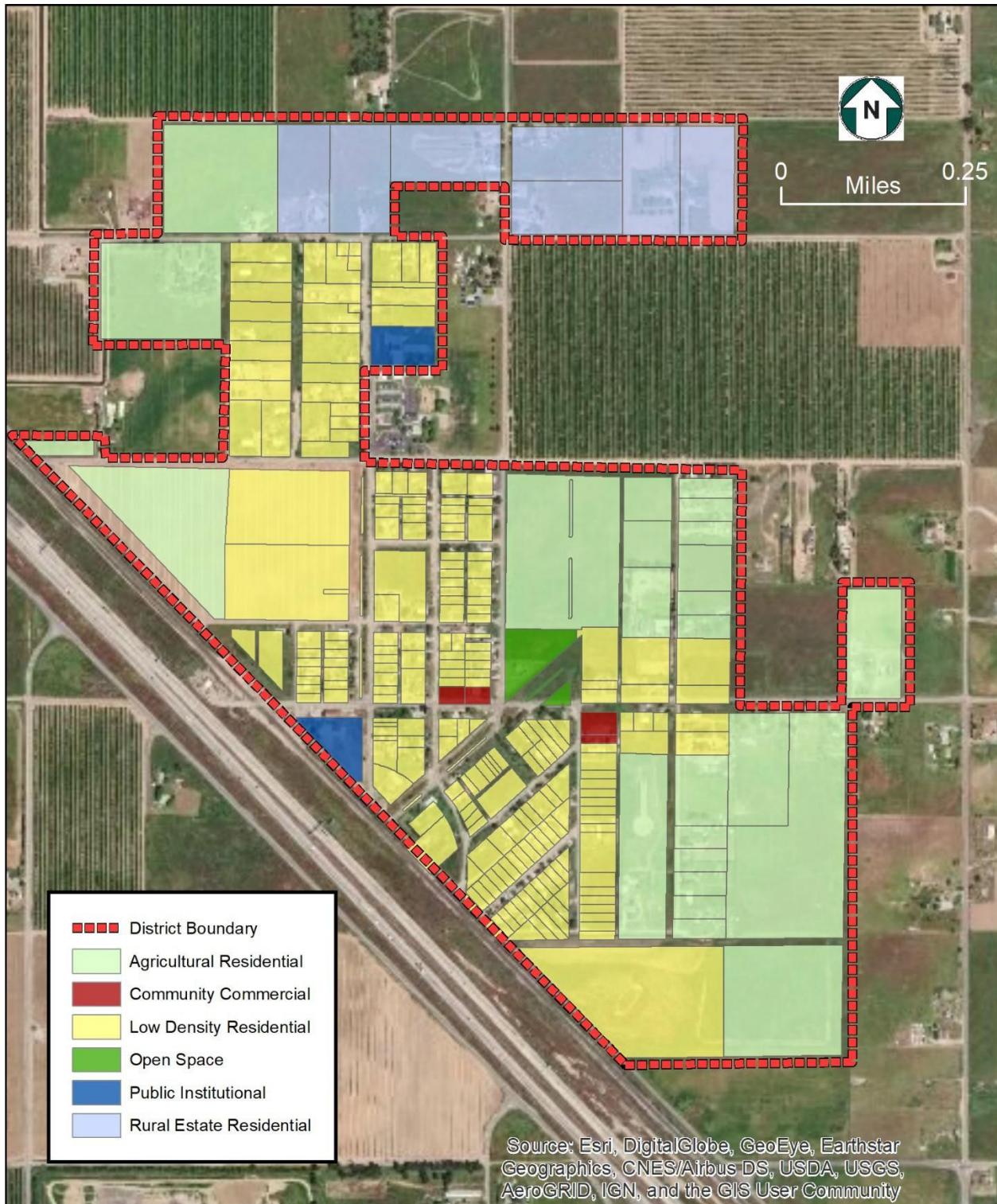




**Figure 3-12**  
Land Use Designations in the City of Chowchilla (from General Plan)







**Figure 3-13**  
**Land Use Designations in MD-33, Fairmead (from General Plan)**

#### *Projected Wastewater Flows at the WWTP*

As shown in Table 3-2, Scenarios 1 and 2 are under the plant capacity of 1.8 MGD and scenarios 3 and 4 are both over. This means the plant capacity is sufficient at the present time, excluding any deficiencies mentioned above, and could accommodate the Fairmead connections under existing conditions.

Scenarios 3 and 4 being over the plant capacity indicate plant expansion will be required between now and complete buildout of the City limits under the General Plan projections.

If the City were to take on the additional connections in Fairmead and without expanding the plant, the remaining capacity left in the plant could accommodate approximately 681 acres of Single Family Residential units, or equivalent. See Table 3-3 for information.

**Table 3-3 WWTP Remaining Capacity – Single Family Residential (SFR) Development**

WWTP Capacity	Existing Flow + MD33	Remaining Capacity	Remaining SFR Development <sup>1</sup>
(gpd)	(gpd)	(gpd)	(acres)
1,800,000	1,119,076	680,924	681

Notes:

1. Single Family Residential loading rate is 1,000 gpd/acre

#### *Collection System Model Results*

The model was created for the entire system, but the focus of this section is on the proposed tie in locations at the 24" domestic and 18" industrial trunklines in Avenue 24 ½. The model was run for four scenarios: Existing Flow, Existing Flow plus Fairmead, Projected Flow at build-out, and Projected Flow plus Fairmead. Table 3-4 contains the model results for when Fairmead is connected to the 24" domestic main.

According to the model results, the existing 24" domestic pipe has capacity to accommodate all four flow scenarios, including the connection to Fairmead.

**Table 3-4 24-inch Domestic Sewer Main Analysis**

Scenario	Scenario Flow <sup>1,5</sup> (gpd)	Pipe Properties			Total Pipe Capacity <sup>4</sup> (gpd)	Capacity Remaining for Scenario (gpd)	Velocity (ft/s)	d/D
		Size (in)	Slope <sup>2</sup> (ft/ft)	Roughness Coefficient <sup>3</sup>				
1	371,419	24	0.0006	0.012	3,879,701	3,508,282	1.21	0.21
2	902,995	24	0.0006	0.012	3,879,701	2,976,706	1.56	0.33
3	1,332,576	24	0.0006	0.012	3,879,701	2,547,125	1.73	0.40
4	1,850,688	24	0.0006	0.012	3,879,701	2,029,013	1.89	0.49

Notes:

1. Flows were determined in the model using WWTP average day flow and applying a peaking factor of 2.0
2. Average slope determined from survey data
3. Assumed aged PVC, coefficient = 0.012
4. Total Capacity determined using Manning's equation and assuming approximately full pipe depth



Table 3-5 shows the model results of when Fairmead is connected to the existing 18" industrial main. Based on the model results, the 18" industrial main has the capacity to accommodate all four flow scenarios, including the connection to Fairmead.

**Table 3-5 18-inch industrial Sewer Main Analysis**

Scenario	Scenario Flow <sup>1</sup> (gpd)	Pipe Properties <sup>3,4</sup>			Total Pipe Capacity <sup>4</sup> (gpd)	Capacity Remaining for Scenario (gpd)	Velocity (ft/s)	d/D
		Size (in)	Slope <sup>2</sup> (ft/ft)	Roughness Coefficient <sup>3</sup>				
1	167,342	18	0.001	0.012	2,325,694	2,158,352	1.18	0.18
2	685,494	18	0.001	0.012	2,325,694	1,640,200	1.77	0.37
3	1,225,342	18	0.001	0.012	2,325,694	1,100,352	2.06	0.52
4	1,743,494	18	0.001	0.012	2,325,694	582,200	2.23	0.65

Notes:

1. Flows were determined in the model using WWTP average day flow and applying a peaking factor of 2.0
2. Average slope determined from survey data
3. Assumed aged PVC, coefficient = 0.012
4. Total Capacity determined using Manning's equation and assuming approximately full pipe depth

During existing conditions there are no pipes shown to be over capacity. Under future conditions, the 8" sewer main in 15<sup>th</sup> Street, from the alley between Kings Avenue and Robertson Blvd. and Hoover Avenue shows likelihood of backups. See Appendix B for printouts of the model for Scenarios 2 and 4.

### 3.6– Geographic Information Systems (GIS)

The process of converting AutoCAD dwg files to an ArcGIS Geodatabase is a straight forward but time-consuming process. There are numerous steps required to ensure data accuracy and usability in a GIS environment.

The AutoCAD dwg file prepared by QK was imported into an ArcGIS SQL Enterprise File Geodatabase for initial evaluation. This includes verifying (and updating when necessary) all line data connects to point data and that the data was imported correctly. ArcGIS provides geoprocessing tools to help automate this process. Any necessary spatial changes were made during this first step. Once the process is complete, the data was imported into the Sanitary Sewer Network data set of Esri's Local Government Information Model. There are several advantages to having the data stored in this Sanitary Sewer Network including the ability to have industry standard data attributes for pipe diameter, material, manholes, and cleanouts. Additionally, the network provides icons for map symbology, services and apps. This aides in harmonizing the information across typical government departments, if necessary. After the data was imported into the Sanitary Sewer Network, all known attributes were entered and checked for accuracy. Such attribute items entered were gravity main diameters, pipe material, manholes, cleanouts, force (pressurized) main diameter, and lateral line diameter. Once this data entry is complete, it can be utilized internally or uploaded and accessed in an ArcGIS Online Organization.

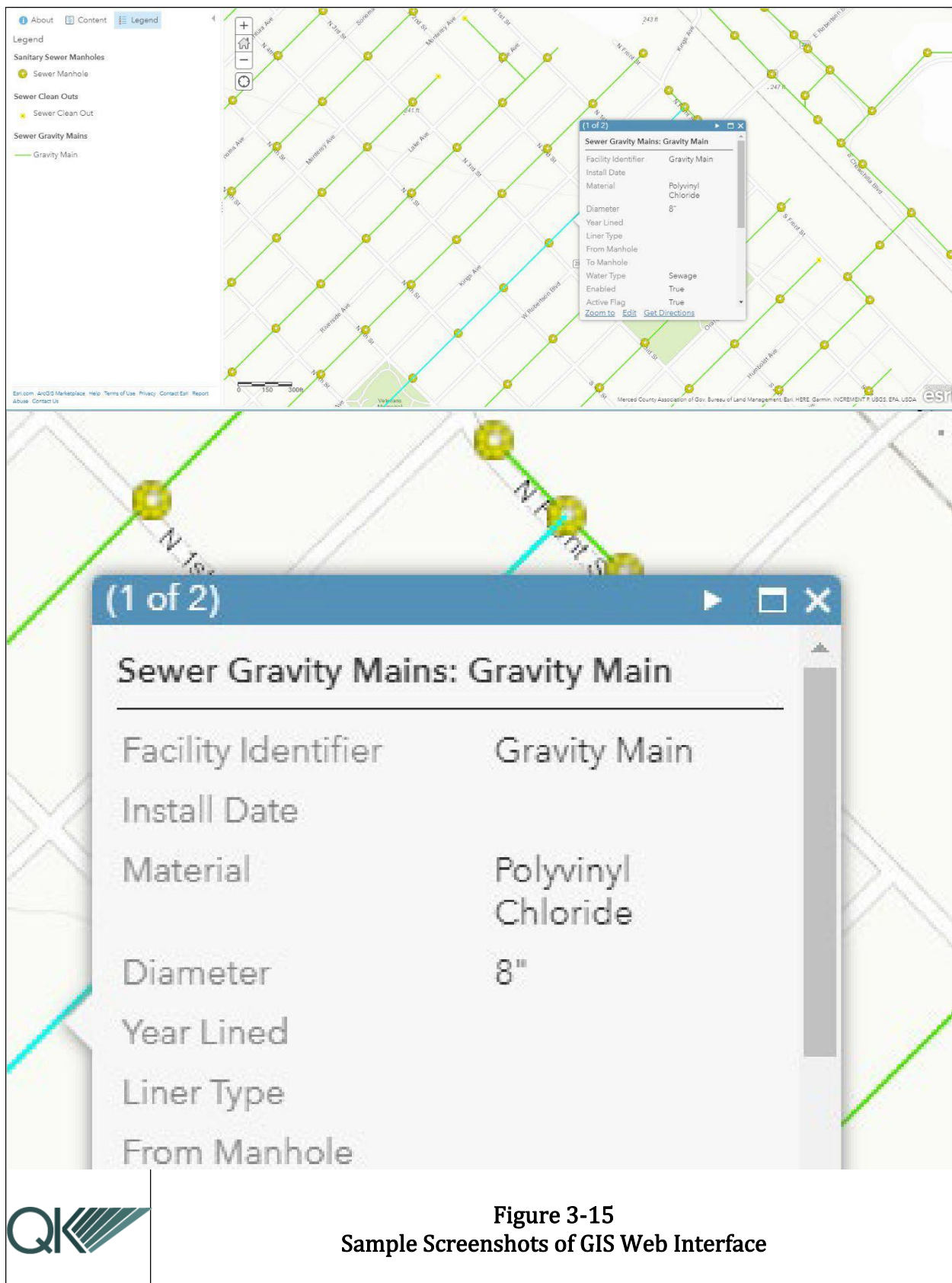
ArcGIS Online is a cloud-based mapping solution that can be utilized to make maps, store and analyze data and shared to collaborate with colleagues, other users or the general public. Data is stored in a private and secure cloud environment backed by Amazon Web Services (AWS) and can be configured and customized in numerous ways to meet a variety of mapping needs and IT requirements. Data can be viewed and interacted with in a 2D or 3D environment (when data is available) and managed internally by users.

After the ArcGIS Online Organization is setup and configured uploaded and stored data can be edited via an internet viewer, ArcGIS Pro, or in the field remotely in a mobile environment. Utilizing either an Android or iOS device data can be accessed remotely and edited and synced on site. Users can access the Organization online and remotely to explore maps and edit content. This allows for customizable onsite GPS data collection that can include images. Applications can be created for specific projects or standard data can be used and, in some cases, viewed real time back in the office.

The GIS data will be made available to the City to be used and updated in whatever format or software they see fit.

See Figures 3-14 and 3-15 for samples of the GIS mapping and online GIS tools.





**Figure 3-15**  
**Sample Screenshots of GIS Web Interface**



## SECTION IV – SUMMARY OF COLLECTION SYSTEM AND WWTP DEFICIENCIES

In the previous section, several deficiencies were identified. They have been divided into three groups. The first group are the deficiencies in the system now, under existing flow conditions. The second group are the upgrades needed to accommodate Fairmead. The third group is related to the overall build-out of the Chowchilla city limits, according to the General Plan.

### 4.1– Existing Deficiencies

#### WWTP

- A1: The existing bar screen does not perform adequate solids removal.
- A2: Wheels, motors, and flights of primary and secondary clarifiers' chain scrapers need to be replaced.
- A3: The timers on the sludge pumps do not work and the pumps are inefficient.
- A4: The main air transmission line is leaking, and diffusers are old and of an obsolete design.
- A5: The blowers' valves and motors need to be inspected and rehabilitated as necessary.
- A6: Digester entry hatches and ladder need to be upgraded to conform to current standards.
- A7: The interior of the digesters needs to be inspected and rehabilitated as necessary.
- A8: Tile-lined drying beds do not allow for drying sludge during wet months.
- A9: The existing controls for the treatment train equipment no longer work.
- A10: Gauges are near or beyond their useful life and need to be replaced.

#### Collection System

- A11: 8" sewer main located between the lots between Circle Drive and Ventura Avenue from Fifth Street to Seventh Street, need to be upsized to 10".
- A12: 8" sewer main starting in Ninth Street at Ventura Avenue and then in the alley between Ventura Avenue and Sonoma Avenue to Eleventh Street, need be upsized to 10".
- A13: 8" sewer main in the alley between Monterey Avenue and Lake Avenue, from Tenth Street to Eleventh Street, need to be upsized to 10".
- A14: 8" sewer main in the alley between Monterey Avenue and Sonoma Avenue, from Sixth Street to Seventh Street needs to be upsized to 10"
- A15: 15" and 12" sewer mains in Myer Street from Kites Way to Robertson Blvd. This area is usually blocked due to a build-up of grease in the line, need to be upsized to 24" & 18".
- A16: 10" sewer main that runs through the Chowchilla High School campus. The school recently constructed a new building which required rerouting of the sewer main. This lessened the slope of the pipe which reduces the velocity of the flow which enables solids to settle out and create blockages in the pipe. The school will occasionally get odor complaints from students or faculty which then triggers a call to City staff, who then comes to flush the lines, clearing any blockages.
- A17: 6" sewer main from the end of the line at Farnesi's Steakhouse to Chowchilla Blvd. The problem is usually a grease blockage and is likely due to the several businesses that prepare food that tie into this line. It is unknown if any of these businesses own a grease trap or if they properly maintain it. The food businesses that they use this line need to build proper grease trap if they don't have proper grease trap, if they already have them then they should make sure they are maintaining them properly.
- A18: Short length of 10" sewer pipe connecting the 24" domestic trunkline and the 18" industrial trunkline near the intersection of Avenue 24 ½ and Road 16.

- A19: None of the existing lift stations have a backup power source.
- A20: The hatch at the Amador Lift Station needs to be replaced.
- A21: Palm lift Station pumps frequently clog due to rags
- A22: Existing bubbler level control system at the Palm Lift Station has air leaks and frequently clogs, preventing proper on/off operation of the lift station.
- A23: None of the existing lift stations have an emergency bypass in the event of an overflow.

#### 4.2– Fairmead Related Deficiencies

##### WWTP

- B1: The addition of Fairmead would increase the flow to above the capacity of one treatment train.

##### Collection System

- B2: New pump station/s and transmission line from Fairmead to the Chowchilla WWTP.

#### 4.3– Future Deficiencies

##### WWTP

- C1: Capacity of wastewater treatment plant needs to be increased to 5.1 MGD to accommodate future build-out of the City.

##### Collection System

- C2: New pumps with higher capacity for all four lift stations need to be installed.
- C3: 8" sewer main in 15<sup>th</sup> Street, from the alley between Kings Avenue and Robertson Blvd. and Hoover Avenue shows likelihood of backups upon complete build-out of City
- C4: Future main lines to serve build out of general plan

#### 4.4– Current Asset, Operation and Maintenance Management Systems

Typical wastewater operations are managed by the City's Standard Operation Procedures (SOP) documents that are kept in a binder at the WWTP and Administration offices. Besides the typical daily operations, daily, weekly and monthly required tasks are listed in the SOP's and logged in daily logs as tasks are completed. Staff maintains a checklist of required monitoring and reporting to follow as required by the Waste Discharge Requirements.

The Public Works Department has a Computerized Maintenance Management System (CMMS) which provides work orders for scheduled and non-scheduled maintenance and to track completed maintenance. However, the WWTP staff mainly uses monthly check lists to track and complete preventative maintenance. With such a small facility, maintenance is easily tracked using this method; however, if needed, it could be added to Public Work's CMMS.

The City's rolling stock is managed and maintained by the Public Works Department.

#### 4.5– Current Operation and Maintenance Costs

The City of Chowchilla maintains a separate budget for each of its enterprises (i.e., water, sewer, street, etc.) The City's current Operation and Maintenance (O&M) costs for the sewer system are budgeted as follows (based on the City's 2019-202 FY Budget):

**Table 4-1 Current Operation and Maintenance Costs (FY 2019-2020)**

<b>Description</b>	<b>Budget Amount</b>
Salaries and Benefits	\$512,580
Operations and Maintenance	\$421,037
Debt Service	\$237,951
Overhead Allocations	\$320,372
Depreciation	\$167,280
Capital Outlay	\$550,000
Transfers Out	\$156,025
<b>Total</b>	<b>\$2,365,245</b>



## SECTION V – PROJECT ALTERNATIVES

### 5.1– Alternatives for Existing Deficiencies

#### WWTP

A1: The existing bar screen does not perform adequate solids removal.

##### **Alternative 1: No Action**

###### Assumptions:

- The existing bar screen would continue to operate and malfunction as it does.

###### Considerations:

- This option would require staff to continue to monitor and clean the bar screen more often due to build-up of rags and debris.
- This option allows passthrough of solids that cause problems further down the treatment train.

##### **Alternative 2: Replace Existing Bar Screen with Smaller Grate Opening**

###### Assumptions:

- The existing screen can be replaced with a new screen with a ¼" grate opening.

###### Considerations:

- This option would improve the quality of water passed on to the first stage of treatment, due to less solids passing through the bar screen.
- This option would lessen the burden on each structure and would allow to take one offline for thorough cleaning and maintenance.

##### **Alternative 3: Install Additional Bar Screen Structure**

###### Assumptions:

- The flow can be split into two bar screen structures before passing along to the rest of the process.

###### Considerations:

- This option would improve the quality of water passed on to the first stage of treatment, due to less solids passing through the bar screen.
- This option would lessen the burden on each structure and would allow to take one offline for thorough cleaning and maintenance.
- This option may not be warranted if the intent is to abandon the existing plant or divert a portion of the flow to another location for treatment.

A2: Wheels, motors, and flights of primary and secondary clarifiers' chain scrapers need to be replaced.

##### **Alternative 1: No Action.**

###### Assumptions:

- Continue to operate the existing components and repair as needed.

- Nothing catastrophic fails that requires complete replacement.

Considerations:

- Parts are limited and some components outdated. Staff has had to piecemeal repairs in recent years.

**Alternative 2: Replace Chain Scrapers**

Assumptions:

- Entire chain scrapers can be replaced and/or refabricated.

Considerations:

- This will improve the sludge processing This is the more expensive option and may not want to be considered if abandonment or replacement of the plant is planned for the near future.

A3: The timers on the sludge pumps do not work and the pumps are inefficient.

**Alternative 1: No Action.**

Assumptions:

- Continue to operate manually as needed.
- Pumps continue to operate inefficiently.

Considerations:

- Requires monitoring and manual operation of pumps on and off.
- Inefficient use of operator's time.

**Alternative 2: Replace Timers and Sludge Pumps**

Assumptions:

- Wiring is good and only the timers need replacement.
- New pumps will be positive displacement cavity screw pumps.

Considerations:

- Would improve sludge processing due to more routine pumping schedule.
- New pumps would operate more efficiently, possibly using less power.

A4: The main air transmission line is leaking, and diffusers are old and of an obsolete design.

**Alternative 1: No Action.**

Assumptions:

- Continue to operate as is and lose air and expend energy that is ultimately unused.

Considerations:

- Capacity of treatment train is not at full potential.

## **Alternative 2: Replace Main Air Transmission Line and Diffusers**

### **Assumptions:**

- Catwalk will need to be replaced as part of the replacement of the new air line or the new air line can be installed above surface.
- New aeration system will be automatically controlled by Dissolved Oxygen (DO) sensors that provide feedback to new VFDs on the blower motors.

### **Considerations:**

- This can provide a considerable increase to the overall treatment capacity of the existing system.
- New diffusers will make system more efficient and will likely use less power.
- DO sensors and VFDs on the blowers will match the power output to the demand, wasting less power and improving the overall operation.

A5: The blowers' valves and motors need to be inspected and rehabilitated as necessary.

## **Alternative 1: No Action**

### **Assumptions:**

- Continue to operate the existing blowers and valves until they fail.

### **Considerations:**

- When blowers fail, there may be redundant blowers, depending on current flow rate.
- Depending on current flow rates, all blowers may be required for proper treatment, which requires immediate response for repairs, which are costly.

## **Alternative 2: Replace Valves and/or Motors**

### **Assumptions:**

- Replacement blower motors and valves are available.

### **Considerations:**

- Costs for planned replacement of blowers and valves is reasonable and doesn't require taking the entire system offline.

A6: Digester entry hatches and ladder need to be upgraded to conform to current standards.

## **Alternative 1: No Action**

### **Assumptions:**

- Overseeing agency has not issued a violation and is not forcing the City to fix substandard hatches or safety equipment.

### **Considerations:**

- Risk of lawsuit if someone is injured or harmed by substandard hatches or safety equipment.

### **Alternative 2: Replace Hatches and Ladders at Digesters**

#### Assumptions:

- Overseeing agency has not issued a violation and is not forcing to fix substandard hatches or safety equipment.

#### Considerations:

- More costly option but is prudent to replace hatches and ladders for the safety of City staff.

A7: The interior of the digesters needs to be inspected and rehabilitated as necessary.

### **Alternative 1: No Action**

#### Assumptions:

- Condition not visible under water surface but reported by City Staff that they need to be rehabilitated.

#### Considerations:

- Structure is vulnerable to deterioration and needs to be maintained regularly.
- Could lead to catastrophic failure of structure depending on current condition and use.

### **Alternative 2: Repair Digester Structure**

#### Assumptions:

- Concrete has spalled due to exposure of methane.

#### Considerations:

- Will need to take digester offline for maintenance.
- Maintenance isn't very complex and costs are low.

A8: Tile-lined drying beds do not allow for drying sludge during wet months.

### **Alternative 1: No Action**

#### Assumptions:

- Continue to process and dry sludge as done currently

#### Considerations:

- Wet months require additional effort/handling to get sludge dried and able to haul.
- Using space for wet sludge storage that could be used for something else.

### **Alternative 2: Install Screw Press and Shelter to Dry Sludge**

#### Assumptions:

- Continue to use tile-drying beds during warm months.
- Use screw press during wet months.

Considerations:

- Will allow the City to dry sludge year round.
- City can utilize storage ponds for other purposes.

A9: The existing controls for the treatment train equipment no longer work.

**Alternative 1: No Action**

Assumptions:

- Report from staff is the conduit between controls and equipment is compromised.
- Assumed that the controls and connected equipment is still operational.

Considerations:

- Manual operation and monitoring is required, using staff time inefficiently.
- When equipment is down, it could be a while before it is noticed, affecting the treatment process.
- Monitoring and readings may not be on a regular schedule.

**Alternative 2: Repair Conduits for Controls**

Assumptions:

- Assumed that the controls and connected equipment is still operational.

Considerations:

- Controls and readings can be taken and recorded on a routine schedule and can be double checked manually if needed.
- Staff time can be used for something other than checking the equipment.
- Deficiencies or faults in the system can be detected and recorded on a routine basis.

**Alternative 3: Install SCADA**

Assumptions:

- Assumed that the connected equipment is still operational.

Considerations:

- Would allow remote monitoring of equipment failures, high water alarms, etc.
- Can provide additional programming/controls of equipment over conventional.

A10: Gauges are near or beyond their useful life

**Alternative 1: No Action**

Assumptions:

- Continue to operate the existing gauges until they fail.

Considerations:

- Costs to replace gauges are minimal.

## **Alternative 2: Replace Gauges**

### Assumptions:

- Compatible gauges are available to replace existing gauges.

### Considerations:

- Costs to replace gauges are minimal.

## **Collection System**

A11: 8-inch sewer main located between the lots between Circle Drive and Ventura Avenue from Fifth Street to Seventh Street.

### **Alternative 1: No Action**

#### Assumptions:

- Leave 8-inch main in place and address blockages and back-ups as they occur.

#### Considerations:

- Sewer System Overflows (SSO) are reported to the State and require time to properly clean-up and address through the State's reporting system.
- Back-ups may affect customers through their own house drains, emitting odor, and unsanitary conditions.

### **Alternative 2: Upsize Existing 8-Inch Sewer Main to 10-Inch**

#### Assumptions:

- Upsizing would alleviate frequency of backups in this area.

#### Considerations:

- Replacement of sewer line would require temporary bypassing of the flow during construction or a complete switchover once the new parallel line is installed.
- Would prevent this area from being a bottleneck in the system as future development occurs.

A12: 8-inch sewer main starting in Ninth Street at Ventura Avenue and then in the alley between Ventura Avenue and Sonoma Avenue to Eleventh Street.

### **Alternative 1: No Action**

#### Assumptions:

- Leave 8 inch main in place and address blockages and back-ups as they occur.

#### Considerations:

- Sewer System Overflows (SSO) are reported to the State and require time to properly clean-up and address through the State's reporting system.
- Back-ups may affect customers through their own house drains, emitting odor, and unsanitary conditions.

### **Alternative 2: Upsize Existing 8-Inch Sewer Main to 10-Inch**

#### **Assumptions:**

- Upsizing would alleviate frequency of backups in this area.

#### **Considerations:**

- Replacement of sewer line would require temporary bypassing of the flow during construction or a complete switchover once the new parallel line is installed.
- Would prevent this area from being a bottleneck in the system as future development occurs.

A13: 8-inch sewer main in the alley between Monterey Avenue and Lake Avenue, from Tenth Street to Eleventh Street.

### **Alternative 1: No Action**

#### **Assumptions:**

- Leave 8-inch main in place and address blockages and back-ups as they occur.

#### **Considerations:**

- Sewer System Overflows (SSO) are reported to the State and require time to properly clean-up and address through the State's reporting system.
- Back-ups may affect customers through their own house drains, emitting odor, and unsanitary conditions.

### **Alternative 2: Upsize Existing 8-Inch Sewer Main to 10-Inch**

#### **Assumptions:**

- Upsizing would alleviate frequency of backups in this area.

#### **Considerations:**

- Replacement of sewer line would require temporary bypassing of the flow during construction or a complete switchover once the new parallel line is installed.
- Would prevent this area from being a bottleneck in the system as future development occurs.

A14: 8" sewer main in the alley between Monterey Avenue and Sonoma Avenue, from Sixth Street to Seventh Street needs to be upsized to 10"

### **Alternative 1: No Action**

#### **Assumptions:**

- Leave 8-inch main in place and address blockages and back-ups as they occur.

#### **Considerations:**

- Sewer System Overflows (SSO) are reported to the State and require time to properly clean-up and address through the State's reporting system.



- Back-ups may affect customers through their own house drains, emitting odor, and unsanitary conditions.

### **Alternative 2: Upsize Existing 8-Inch Sewer Main to 10-Inch**

#### **Assumptions:**

- Upsizing would alleviate frequency of backups in this area.

#### **Considerations:**

- Replacement of sewer line would require temporary bypassing of the flow during construction or a complete switchover once the new parallel line is installed.
- Would prevent this area from being a bottleneck in the system as future development occurs.

A15: 15-inch and 12-inch sewer mains in Myer Street from Kites Way to Robertson Blvd. This area is usually blocked due to a build-up of grease in the line.

### **Alternative 1: No Action**

#### **Assumptions:**

- Leave 15-inch and 12-inch mains in place and address blockages and back-ups as they occur.

#### **Considerations:**

- Sewer System Overflows (SSO) are reported to the State and require time to properly clean-up and address through the State's reporting system.
- Back-ups may affect customers through their own house drains, emitting odor, and unsanitary conditions.

### **Alternative 2: Upsize Existing 15-Inch to 24-Inch and existing 12-Inch to 18-Inch.**

#### **Assumptions:**

- Upsizing would alleviate frequency of backups in this area.

#### **Considerations:**

- Replacement of sewer line would require temporary bypassing of the flow during construction or a complete switchover once the new parallel line is installed.
- Would prevent this area from being a bottleneck in the system as future development occurs.

A16: 10" sewer main that runs through the Chowchilla High School campus. The school recently constructed a new building which required rerouting of the sewer main. This lessened the slope of the pipe which reduces the velocity of the flow which enables solids to settle out and create blockages in the pipe. The school will occasionally get odor complaints from students or faculty which then triggers a call to City staff, who then comes to flush the lines, clearing any blockages.

### **Alternative 1: No Action**

#### **Assumptions:**

- Leave 10-inch main in place and address blockages and back-ups as they occur.

#### **Considerations:**

- Sewer System Overflows (SSO) are reported to the State and require time to properly clean-up and address through the State's reporting system.
- Back-ups often affect the campus drains, emitting odor, and unsanitary conditions.

### **Alternative 2: Upsize Existing 10-Inch Sewer Main to 12-Inch**

#### **Assumptions:**

- Upsizing would help to alleviate frequency of backups in this area.

#### **Considerations:**

- Replacement of sewer line would require temporary bypassing of the flow during construction or a complete switchover once the new parallel line is installed.
- Would prevent this area from being a bottleneck in the system as future development occurs.

A17: 6" sewer main from the end of the line at Farnesi's Steakhouse to Chowchilla Blvd. The problem is usually a grease blockage and is likely due to the several businesses that prepare food that tie into this line. It is unknown if any of these businesses own a grease trap or if they properly maintain it. The food businesses that they use this line need to build proper grease trap if they don't have proper grease trap, if they already have them then they should make sure they are maintaining them properly.

### **Alternative 1: No Action**

#### **Assumptions:**

- Leave 6-inch main in place and address blockages and back-ups as they occur.

#### **Considerations:**

- Sewer System Overflows (SSO) are reported to the State and require time to properly clean-up and address through the State's reporting system.
- Back-ups often affect the campus drains, emitting odor, and unsanitary conditions.

### **Alternative 2: Upsize Existing 6-Inch Sewer Main to 10-Inch**

#### **Assumptions:**

- Upsizing would help to alleviate frequency of backups in this area.

#### **Considerations:**

- Replacement of sewer line would require temporary bypassing of the flow during construction or a complete switchover once the new parallel line is installed.

- Would prevent this area from being a bottleneck in the system as future development occurs.

### **Alternative 3: Address the Grease Discharged by Farnesi's and any Others in the Area**

#### **Assumptions:**

- This line is at the end of the system and doesn't get much flow.
- The blockages are typically due to grease buildup in the line.

#### **Considerations:**

- City should check with Food preparers in the area to evaluate the effectiveness of their grease trap system and if it has been maintained properly and emptied regularly.
- If they don't have a grease trap, they should be required to install one.

A18: Short length of 10" sewer pipe connecting the 24" domestic trunkline and the 18" industrial trunkline near the intersection of Avenue 24 ½ and Road 16.

### **Alternative 1: No Action**

#### **Assumptions:**

- Leave 10-inch section in place and address blockages and back-ups as they occur.

#### **Considerations:**

- Sewer System Overflows (SSO) are reported to the State and require time to properly clean-up and address through the State's reporting system.
- Back-ups may affect customers through their own house drains, emitting odor, and unsanitary conditions.

### **Alternative 2: Upsize Existing 10-Inch Sewer Main to 24-Inch**

#### **Assumptions:**

- Upsizing would alleviate frequency of backups in this area.

#### **Considerations:**

- Replacement of sewer line would require temporary bypassing of the flow during construction.
- Would prevent this area from being a bottleneck in the system now and as future development occurs.

A19: None of the existing lift stations have a backup power source.

### **Alternative 1: No Action**

#### **Assumptions:**

- In the event of a power failure, the lift stations will cease to operate and wastewater will begin to back up in the collection system.

#### **Considerations:**

- Frequent backups in the system or standing water can allow settling of solids in the line, causing future obstacles and backups.
- Extreme backup can cause SSO in the street and possibly backups into customer services.

### **Alternative 2: Install Permanent Backup Power Source at Each Lift Station**

#### Assumptions:

- Improvements will likely include electrical improvements including an automatic transfer switch

#### Considerations:

- A backup generator will allow continued function of the lift station during a power outage, reducing risk of backups and liability for the City.
- Generator will require occasional testing by Staff.

### **Alternative 3: Use One or More Portable Generators at Each Lift Station**

#### Assumptions:

- Improvements will likely include electrical improvements including automatic transfer switch and a new quick connect at the Howell pump station.

#### Considerations:

- A portable generator will allow the City to relocate the unit to whatever lift station needs the backup power.
- Each lift station has different electrical requirements and the portable generator may not be sized to be used at every lift station, so multiple units of varying sizes may need to be purchased.
- One or two units can be used to power any of the lift stations but will require staff to relocate the generator as needed.
- If the generator needs to be relocated there will likely already be some backing up in the collection system.

A20: The hatch at the Amador Lift Station needs to be replaced.

### **Alternative 1: No Action**

#### Assumptions:

- Existing wooden cover will remain.

#### Considerations:

- Wooden cover is not safe nor secure.
- Wooden cover is a liability to the City

### **Alternative 2: Install New Lockable Hatch**

#### Assumptions:

- Hatch is available for the opening size

Considerations:

- A new lockable hatch will add security to the lift station and reduce liability to staff and the City.

A21: Palm lift Station pumps frequently clog due to rags

**Alternative 1: No Action**

Assumptions:

- Rags will continue to be a problem at the lift station

Considerations:

- When the pumps need to be taken offline for maintenance there is potential for backup of wastewater in the collection system.

**Alternative 2: Replace Pumps with Chopper Style Impeller**

Assumptions:

- If the pumps can be fitted with a chopper impeller, the existing pump can remain.
- If the pumps cannot be fitted with a chopper style impeller, the entire pump will be replaced.

Considerations:

- This will increase reliability of the lift station and reduce blockages in the system.
- Chopper style impeller will assist in the processing of solids within the collection system.

A22: Existing bubbler level control system at the Palm Lift Station has air leaks and frequently clogs, preventing proper on/off operation of the lift station.

**Alternative 1: No Action**

Assumptions:

- Unreliable operation of level controls will continue.

Considerations:

- Unreliable controls may lead to pumps not operating when they should which can lead to system backups or SSOs.

**Alternative 2: Replace Level Controls with Ultrasonic Level Transducer**

Assumptions:

- Existing electrical panel is compatible with a 4-20mA signal from a level transducer.

Considerations:

- On/off controls of pumps based on water level will operate more efficiently.
- Adds flexibility to pump control settings.

A23: None of the existing lift stations have an emergency bypass in the event of an overflow.

**Alternative 1: No Action**

Assumptions:

- When a large backup occurs, the wastewater spills out of the lowest manhole of the sewer line.

Considerations:

- SSOs are reported to the State and require time to properly clean-up and address through the State's reporting system.
- Back-ups may affect customers through their own house drains, emitting odor, and unsanitary conditions.

**Alternative 2: Install a Bypass Pipeline at Each Lift Station**

Assumptions:

- Each lift station wet well can be connected to a nearby downstream manhole with a shallow bypass pipe.

Considerations:

- In the event of a high-water situation, the bypass line will allow gravity flow from the wet well to a downstream manhole.
- Depending on the hydraulics of the lift station and surrounding pipes, the bypass line may help, but not fully prevent an SSO.

## 5.2– Alternatives for Fairmead Related Deficiencies

### WWTP

B1: The addition of Fairmead would put the total flow above 0.9 mgd which is what the existing plant can handle when one of the treatment trains are offline.

**Alternative 1: No Action**

Assumptions:

- Unless the RWQCB allows a temporary reduction in the waste discharge requirements, the capacity of the existing WWTP must be limited to 0.90 mgd. This would allow either half of the existing WWTP to be shut down for maintenance and/or repair while still meeting waste discharge requirements.
- There is a possibility that one half of the existing WWTP can treat more than 0.90 mgd when the other half is shut down for maintenance and/or repairs if the RWQCB would allow a temporary reduction in the waste discharge requirements.
- Parts, equipment, etc. that would be needed to keep the existing WWTP in operation long term are available.

Considerations:

- Contact the RWQCB to determine if, during a shutdown of a half of the existing WWTP for maintenance and/or repairs, the waste discharge requirements can be temporarily reduced, and if so, by how much.

- Attempt to estimate the maximum influent flow through one half of the existing WWTP that will not cause the effluent quality to exceed the reduced waste discharge requirements allowed by the RWQCB.
- Determine the hydraulic capacity of one half of the existing WWTP and compare it to the maximum allowable influent flow based on effluent quality.
- A moratorium on development would need to be issued until the plant capacity is increased or a new plant is built.

### **Alternative 2: Construct 0.90 MGD Package Treatment Plant**

#### **Assumptions:**

- Keep the existing WWTP in service for as long as possible
- Parts, equipment, etc. that would be needed to keep the existing WWTP in operation long term are available
- Each half of the existing WWTP can treat 0.90 mgd.
- A new package WWTP with capacity of approximately 0.90 mgd would be added as a third treatment train
- Domestic and industrial flows would not be separated

#### **Considerations:**

- The new treatment train (package plant) would bring the total WWTP capacity to 2.7 MGD or 1.8 MGD with one of the existing trains offline.
- The new 0.9 mgd package plant would be funded 100% by Fairmead
- Once the existing plant is no longer operational or when demand grows to above 2.8 mgd, a new WWTP with a capacity of 5.1 mgd will be required

### **Alternate 3: Construct Supplemental Ponds for Temporary Diversion, 5.1 MG WWTP in the Future**

#### **Assumptions:**

- Keep the existing WWTP in service for as long as possible
- Parts, equipment, etc. that would be needed to keep the existing WWTP in operation long term are available
- Each half of the existing WWTP can treat 0.90 mgd.
- Presently the capacity of the existing WWTP should be limited to 0.90 mgd so that either half of the existing WWTP can be shut down for maintenance and/or repair, and waste discharge requirements can still be met.
- Domestic and industrial flows would not be separated

#### **Considerations:**

- Determine the feasibility of constructing a simple, low cost pond treatment system with a capacity of 0.90 mgd where influent can be diverted temporarily so that either half of the existing WWTP can be taken offline for maintenance and/or repair.



- If a simple, low cost pond system is feasible, the existing WWTP would have an assumed capacity of 1.8 mgd but this could be limited by its age.
- The new treatment ponds would be funded 100% by Fairmead
- As the existing WWTP reaches the end of its useful life, construct a new 5.1 mgd WWTP.

#### **Alternate 4: Separate Industrial from Domestic Waste, Construct New 0.5 MGD Package Plant**

##### **Assumptions:**

- The majority of the existing and future industrial flow can be separated from the domestic flow
- The total effluent flow to the existing WWTP is estimated at 0.86 mgd. The combined existing light and heavy industrial flow is estimated at about 0.16 mgd. The portion of the future industrial flow after buildout of the general plan area that can be separated out is estimated at 1.4 mgd. The total flow from the buildout of the general plan area is about 5.1 mgd.

##### **Considerations:**

- Treat industrial wastewater separately from domestic waste
- Construct a 0.5 mgd industrial package WWTP and modify the existing collection system to separate the majority of the industrial flows.
- The cost of the 0.5 mgd package WWTP would be paid for by Fairmead  
Future expansion or addition of other package treatment plants will be paid for by future developers.
- After construction of the new industrial WWTP the existing effluent flow to the existing WWTP would be reduced to  $0.86 - 0.16 = 0.70$  mgd, which is below the capacity of one side (0.9 mgd) of the existing plant.
- The initial available capacity of the new industrial WWTP would be  $0.5 - 0.16$  (Existing Industrial)  $- 0.26$  (Fairmead)  $= 0.08$  mgd.
- Once the existing plant is no longer operational or when demand grows to above capacity, a new WWTP with a capacity of 5.1 mgd will be required.

#### **Alternative 5: Construct 0.50 MGD Package Treatment Plant**

##### **Assumptions:**

- Keep the existing WWTP in service for as long as possible
- Parts, equipment, etc. that would be needed to keep the existing WWTP in operation long term are available
- Each half of the existing WWTP can treat 0.90 mgd.
- A new package WWTP with capacity of approximately 0.50 mgd would be added as a third treatment train
- Domestic and industrial flows would not be separated

Considerations:

- The new treatment train (package plant) would bring the total WWTP capacity to 2.3 MGD or 1.4 MGD with one of the existing trains offline.
- The new 0.50 mgd package plant would be funded 100% by Fairmead
- Once the existing plant is no longer operational or when demand grows to above 2.3 mgd, the package plant could be expanded or a new WWTP with a capacity of 5.1 mgd will be required

**Alternate 6: Install Bypass Piping and New Aeration Basin**

Assumptions:

- Keep the existing WWTP in service for as long as possible
- Parts, equipment, etc. that would be needed to keep the existing WWTP in operation long term are available
- Each half of the existing WWTP can treat 0.90 mgd.
- Presently the capacity of the existing WWTP should be limited to 0.90 mgd so that either half of the existing WWTP can be shut down for maintenance and/or repair, and waste discharge requirements can still be met.
- Domestic and industrial flows would not be separated

Considerations:

- Bypass piping would be installed to allow changeover of water from one train to the other and alternatively to a third, new aeration basin. This would increase the aeration capacity of the plant which is a large component of the process.
- This option allows a portion of one of the trains to be taken offline for maintenance.
- The rest of the treatment train would remain the same.
- If this option is selected, several of the other improvements listed under A1 through A10 should be completed.

## Collection System

B2: New pump station/s and transmission line from Fairmead to the Chowchilla WWTP.

A previous alternatives analysis was completed by Stantec in 2015 for the Madera County Public Works MD-33 to review options regarding the wastewater generated by the Fairmead connections. It was determined in that report, that the best alternative was to establish a gravity collection system in Fairmead and to install a pump station and force main to connect the new Fairmead collection system to that of Chowchilla. This would allow treatment of Fairmead's wastewater at the existing Chowchilla WWTP. Project alternatives within Fairmead will not be evaluated in this report as it has already been determined a collection system is needed. This report will provide alternative projects for the conveyance of the wastewater from Fairmead to the Chowchilla WWTP.

### **Alternative 1: Lift Station and Force Main to the Existing Chowchilla WWTP**

#### **Assumptions:**

- A new gravity collection system would be installed in Fairmead.
- A new sewer lift station and force main would be installed to convey Fairmead's collected wastewater to the existing treatment plant in Chowchilla.

#### **Considerations:**

- This option would have no impact on the City's existing collection system; only at the WWTP.
- This option would not facilitate any other connections between Fairmead and the Chowchilla WWTP.

### **Alternative 2: Lift Station and Force Main to the Existing 24-inch Domestic Gravity Sewer Main**

#### **Assumptions:**

- The existing 24-inch Domestic main is adequately sized for future build-out of the east side of Chowchilla plus Fairmead.
- A new gravity collection system would be installed in Fairmead.
- A new sewer lift station and force main would be installed to convey Fairmead's collected wastewater to the existing 24-inch domestic main near Chowchilla Blvd and Avenue 24 ½.

#### **Considerations:**

- This option would require less footage of force main to be installed compared to Alternative 1.
- This option would not facilitate any other connections between Fairmead and the Chowchilla WWTP.
- This option would require two pump stations-One in Fairmead and another placed just south of the Brenda Slough.

### **Alternative 3: Extend Existing 18-inch Industrial Gravity Sewer Main and Install Lift Station and Force Main to the End of the Extension**

#### **Assumptions:**

- The existing 18-inch Industrial main is adequately sized for future industrial development plus Fairmead.
- The existing 18-inch gravity sewer can be extended along Road 16 and Avenue 24. See Figure 5-1.
- A new gravity collection system would be installed in Fairmead.
- A new sewer lift station and force main would be installed to convey Fairmead's collected wastewater to the end of the newly extended Chowchilla gravity system.

#### **Considerations:**

- This option would require less footage of force main to be installed compared to Alternative 1.

- This option would allow for connections to the gravity sewer between Fairmead and the Chowchilla WWTP.
- This option would require two smaller pump stations-One in Fairmead and another placed just south of the Brenda Slough.
- Maintenance costs would be less for this option since much of the connection will be gravity sewer, requiring less power and maintenance

### 5.3 – Alternatives for Future Deficiencies

#### WWTP

C1: Overall capacity of the wastewater treatment plant needs to be increased.

As mentioned in the alternatives analysis, the future treatment capacity is anticipated to be 5.1 MGD. Any of the following expansion alternatives will require an application to the State to amend the City's existing waste Discharge permit. It is also anticipated that any new expansion now will allow for the connection of Fairmead, plus some additional capacity for Chowchilla. The costs related to a new plant or expansion of the existing plant to 5.1 MGD, for future buildout of the City, will be borne by developers and are not included in this report.

#### Collection System

C2: New pumps with higher capacity for all four lift stations need to be installed.

##### **Alternative 1: No Action**

##### Assumptions:

- As the City continues to grow, additional flow will pass through the existing lift stations.
- Existing capacity of each existing lift station will need to be determined. Data not available at this time.

##### Considerations:

- The existing lift stations will operate at their current capacity which may be less than the future flow, causing backups in the system.

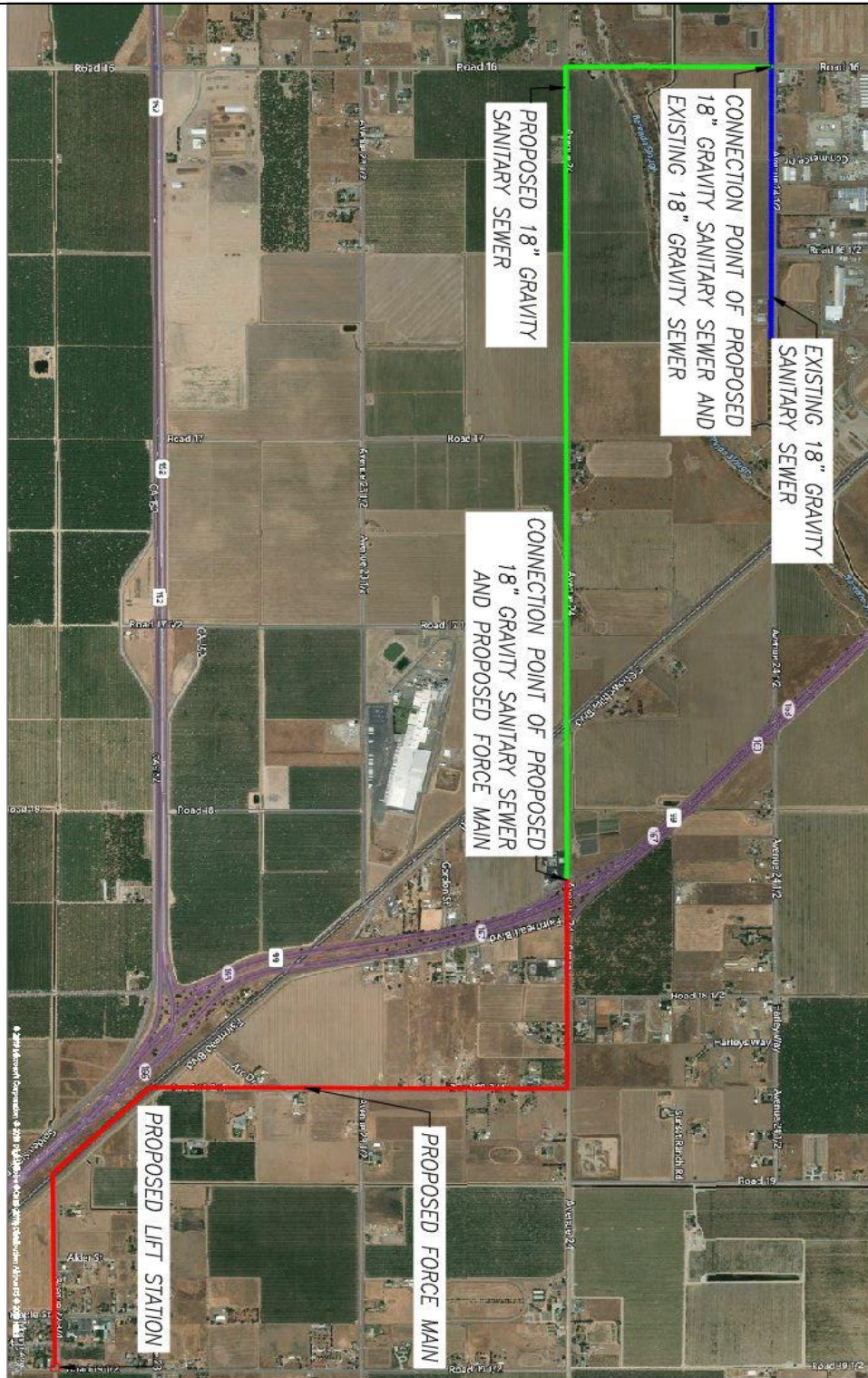
##### **Alternative 2: Replace the Pumps in Each Lift Station**

##### Assumptions:

- As the City continues to grow, additional flow will pass through the existing lift stations.
- Existing capacity of each existing lift station will need to be determined. Data not available at this time.
- Pump capacities can be increased without having to rebuild the entire lift station.

##### Considerations:

- When the pumps are upsized, the City should consider chopper style impellers to improve processing of solids at each lift station.
- Upsizing of pumps may also require upsizing of electrical service panel and components.



**Figure 5-1**  
**Fairmead Connection to Chowchilla System**



C3: 8" sewer main in 15<sup>th</sup> Street, from the alley between Kings Avenue and Robertson Blvd. and Hoover Avenue shows likelihood of backups upon complete build-out of City

**Alternative 1: No Action**

Assumptions:

- Leave 8-inch main in place and address blockages and back-ups as they occur.

Considerations:

- Sewer System Overflows (SSO) are reported to the State and require time to properly clean-up and address through the State's reporting system.
- Back-ups often affect the campus drains, emitting odor, and unsanitary conditions.

**Alternative 2: Upsize Existing 8-Inch Sewer Main to 10-Inch**

Assumptions:

- Upsizing would help to alleviate frequency of backups in this area.

Considerations:

- Replacement of sewer line would require temporary bypassing of the flow during construction or a complete switchover once the new parallel line is installed.
- Would prevent this area from being a bottleneck in the system as future development occurs.

C4: Future main lines to serve build out of general plan

**Alternative 1: No Action**

Assumptions:

- As build-out occurs, extension of gravity sewer mains will be required.

Considerations:

- This would prevent the City from serving any newly developed areas that don't currently have sewer mains installed.

**Alternative 2: Construct new gravity sewer mains to serve new development**

Assumptions:

- New gravity sewer mains will be installed in existing or newly developed right-of-way.

Considerations:

- Actual improvements will be dependent on when and where development occurs.
- Costs to developers may be shared by the City and with other future developers through reimbursement agreements.



## 5.4- Cost Comparison

Table 5-1 contains a summary of costs for each of the proposed alternatives discussed herein. The construction costs are shown separately from the soft costs which range from 10% to 25%, depending on the nature of the project. A 20% contingency amount is also added to each project to account for fluctuations in pricing and unforeseeable conditions that will come up during design and construction. Individual cost estimate breakdowns are provided in Appendix C.

**Table 5-1 Summary of Capital Costs for Alternatives**

Deficiency Number and Description		Alternative	Construction Costs	Engineering, Survey, Environmental, Legal, Construction Management (10-25%)	Contingency (20%)	Total Project Capital Costs
A1	Existing Bar Screen Not Adequate	Alt 1	\$0	\$0	\$0	\$0
		Alt 2	\$18,000	\$1,800	\$3,600	\$23,400
		Alt 3	\$335,000	\$50,250	\$67,000	\$452,250
A2	Chain Scrapers Beyond Useful Life	Alt 1	\$0	\$0	\$0	\$0
		Alt 2	\$630,000	\$63,000	\$126,000	\$819,000
A3	Broken Timers and Sludge Pumps	Alt 1	\$0	\$0	\$0	\$0
		Alt 2	\$75,000	\$11,250	\$15,000	\$101,250
A4	Air Line is Leaking and Bad Diffusers	Alt 1	\$0	\$0	\$0	\$0
		Alt 2	\$505,000	\$75,750	\$101,000	\$681,750
A5	Blowers and Valves Beyond Useful Life	Alt 1	\$0	\$0	\$0	\$0
		Alt 2	\$195,000	\$29,250	\$39,000	\$263,250
A6	Old Digester Entry Hatches and Ladders	Alt 1	\$0	\$0	\$0	\$0
		Alt 2	\$38,000	\$3,800	\$7,600	\$49,400
A7	Interior of Digesters Deteriorating	Alt 1	\$0	\$0	\$0	\$0
		Alt 2	\$38,000	\$3,800	\$7,600	\$49,400
A8	Drying Beds Not Working in Winter	Alt 1	\$0	\$0	\$0	\$0
		Alt 2	\$880,000	\$220,000	\$176,000	\$1,276,000
A9	Existing Controls Not Working	Alt 1	\$0	\$0	\$0	\$0
		Alt 2	\$145,000	\$21,750	\$29,000	\$195,750
		Alt 3	\$445,000	\$111,250	\$89,000	\$645,250
A10	Gauges Beyond Useful Life	Alt 1	\$0	\$0	\$0	\$0
		Alt 2	\$8,000	\$1,200	\$1,600	\$10,800
A11	8" Main Between Circle Drive & Ventura Avenue	Alt 1	\$0	\$0	\$0	\$0
		Alt 2	\$378,760	\$56,814	\$75,752	\$511,326
A12	8" Main Along Ninth Street and Sonoma Avenue	Alt 1	\$0	\$0	\$0	\$0
		Alt 2	\$225,360	\$33,804	\$45,072	\$304,236
A13	8" Main Between Monterey Avenue and Lake Avenue (10th to 11th)	Alt 1	\$0	\$0	\$0	\$0
		Alt 2	\$181,660	\$27,249	\$36,332	\$245,241
A14	8" Main Between Monterey Avenue and Lake Avenue (6th to 7th)	Alt 1		\$0	\$0	\$0
		Alt 2	\$181,660	\$27,249	\$36,332	\$245,241
A15	12" and 15" Mains in Myer Street	Alt 1	\$0	\$0	\$0	\$0
		Alt 2	\$473,652	\$71,048	\$94,730	\$639,430



A16	10" Main on High School Campus	Alt 1	\$0	\$0	\$0	\$0
		Alt 2	\$227,432	\$34,115	\$45,486	\$307,033
A17	6" Main near Farnesi's Steakhouse	Alt 1	\$0	\$0	\$0	\$0
		Alt 2	\$263,910	\$39,587	\$52,782	\$356,279
		Alt 3	\$0	\$0	\$0	\$0
A18	10" Connection Pipe at Road 16 and Avenue 24 1/2	Alt 1	\$0	\$0	\$0	\$0
		Alt 2	\$101,150	\$15,173	\$20,230	\$136,553
A19	No Backup Power at Lift Stations	Alt 1	\$0	\$0	\$0	\$0
		Alt 2	\$715,000	\$107,250	\$143,000	\$965,250
		Alt 3	\$250,000	\$37,500	\$50,000	\$337,500
A20	No Hatch at Amador Lift Station	Alt 1	\$0	\$0	\$0	\$0
		Alt 2	\$8,000	\$1,200	\$1,600	\$10,800
A21	Frequent Clogs at Palm Lift Station	Alt 1	\$0	\$0	\$0	\$0
		Alt 2	\$75,000	\$11,250	\$15,000	\$101,250
A22	Bad Level Sensor at Palm Lift Station	Alt 1	\$0	\$0	\$0	\$0
		Alt 2	\$23,000	\$3,450	\$4,600	\$31,050
A23	No Emergency Bypass Pipe at Any Lift Station	Alt 1	\$0	\$0	\$0	\$0
		Alt 2	\$200,800	\$40,160	\$40,160	\$281,120
B1	Additional WWTP Capacity Needed	Alt 1	\$0	\$0	\$0	\$0
		Alt 2	\$0	\$0	\$0	\$0
		Alt 3	\$8,500,000	\$425,000	\$1,700,000	\$10,625,000
		Alt 4	\$6,700,000	\$670,000	\$1,340,000	\$8,710,000
		Alt 5	\$6,700,000	\$670,000	\$1,340,000	\$8,710,000
		Alt 6	\$5,975,000	\$298,750	\$1,195,000	\$7,468,750
B2	New Collection System and Conveyance to Chowchilla	Alt 1	\$7,447,592	\$1,117,139	\$1,489,518	\$10,054,249
		Alt 2	\$6,784,592	\$1,017,689	\$1,356,918	\$9,159,199
		Alt 3	\$8,513,932	\$1,277,090	\$1,702,786	\$11,493,808
C1	Future WWTP Buildout	NA	NA	NA	NA	NA
C2	New Pumps in Lift Stations	Alt 1	\$0	\$0	\$0	\$0
		Alt 2	\$92,000	\$13,800	\$18,400	\$124,200
C3	8" Sewer Main in 15th Street	Alt 1	\$0	\$0	\$0	\$0
		Alt 2	\$232,060	\$34,809	\$46,412	\$313,281
C4	Future Main Lines to New Development	Alt 1	\$0	\$0	\$0	\$0
		Alt 2	\$9,041,269	\$2,260,317	\$1,808,254	\$13,109,840

The Total Life Cycle costs are calculated using a base Construction Cost Index (CCI) of 11418.16 (May 2020) with an annual increase of 1.7% based on recent trends of the ENR 20-City Average. Future O&M costs, if any, are converted to present day dollars. Salvage values, if any, are also converted to present day dollars and subtracted from total life cycle costs. The 30-year Discount Rate used for these calculations is 1.5% (from OMB Circular No. A-94 APPENDIX C). Table 5-2 provides the total life cycle costs for each of the alternatives.

**Table 5-2 Total Life Cycle Costs for Alternatives**

Deficiency Number and Description		Alternative	Total Capital Costs	Useful Life (yrs)	Annual O&M (in addition to Current O&M)	Present Value of O&M over Useful Life	Total Life Cycle Cost
A1	Existing Bar Screen Not Adequate	Alt 1	\$0	NA	\$0	\$0	\$0
		Alt 2	\$23,400	40	\$0	\$0	\$23,400
		Alt 3	\$452,250	40	\$4,500	\$134,621	\$586,871
A2	Chain Scrapers Beyond Useful Life	Alt 1	\$0	NA	\$0	\$0	\$0
		Alt 2	\$819,000	40	\$0	\$0	\$819,000
A3	Broken Timers and Sludge Pumps	Alt 1	\$0	NA	\$0	\$0	\$0
		Alt 2	\$101,250	25	\$0	\$0	\$101,250
A4	Air Line is Leaking and Bad Diffusers	Alt 1	\$0	NA	\$0	\$0	\$0
		Alt 2	\$681,750	40	\$0	\$0	\$681,750
A5	Blowers and Valves Beyond Useful Life	Alt 1	\$0	NA	\$0	\$0	\$0
		Alt 2	\$263,250	25	\$0	\$0	\$263,250
A6	Old Digester Entry Hatches and Ladders	Alt 1	\$0	NA	\$0	\$0	\$0
		Alt 2	\$49,400	50	\$0	\$0	\$49,400
A7	Interior of Digesters Deteriorating	Alt 1	\$0	NA	\$0	\$0	\$0
		Alt 2	\$49,400	50	\$0	\$0	\$49,400
A8	Drying Beds Not Working in Winter	Alt 1	\$0	NA	\$0	\$0	\$0
		Alt 2	\$1,276,000	30	\$0	\$0	\$1,276,000
A9	Existing Controls Not Working	Alt 1	\$0	NA	\$0	\$0	\$0
		Alt 2	\$195,750	25	\$0	\$0	\$195,750
		Alt 3	\$645,250	25	\$0	\$0	\$645,250
A10	Gauges Beyond Useful Life	Alt 1	\$0	NA	\$0	\$0	\$0
		Alt 2	\$10,800	40	\$0	\$0	\$10,800
A11	8" Main Between Circle Drive & Ventura Avenue	Alt 1	\$0	NA	\$0	\$0	\$0
		Alt 2	\$511,326	70	\$0	\$0	\$511,326
A12	8" Main Along Ninth Street and Sonoma Avenue	Alt 1	\$0	NA	\$0	\$0	\$0
		Alt 2	\$304,236	70	\$0	\$0	\$304,236
A13	8" Main Between Monterey Avenue and Lake Avenue (10th to 11th)	Alt 1	\$0	NA	\$0	\$0	\$0
		Alt 2	\$245,241	70	\$0	\$0	\$245,241
A14	8" Main Between Monterey Avenue and Lake Avenue (6th to 7th)	Alt 1	\$0	NA	\$0	\$0	\$0
		Alt 2	\$245,241	70	\$0	\$0	\$245,241
A15	12" and 15" Mains in Myer Street	Alt 1	\$0	NA	\$0	\$0	\$0
		Alt 2	\$639,430	70	\$0	\$0	\$639,430
A16	10" Main on High School Campus	Alt 1	\$0	NA	\$0	\$0	\$0
		Alt 2	\$307,033	70	\$0	\$0	\$307,033
A17	6" Main near Farnesi's Steakhouse	Alt 1	\$0	NA	\$0	\$0	\$0
		Alt 2	\$356,279	70	\$0	\$0	\$356,279
		Alt 3	\$0	40	\$0	\$0	\$0
A18	10" Connection Pipe at Road 16 and Avenue 24 1/2	Alt 1	\$0	NA	\$0	\$0	\$0
		Alt 2	\$136,553	70	\$0	\$0	\$136,553

A19	No Backup Power at Lift Stations	Alt 1	\$0	NA	\$0	\$0	\$0
		Alt 2	\$965,250	20	\$10,000	\$171,686	\$1,136,936
		Alt 3	\$337,500	40	\$2,000	\$59,832	\$397,332
A20	No Hatch at Amador Lift Station	Alt 1	\$0	NA	\$0	\$0	\$0
		Alt 2	\$10,800	50	\$0	\$0	\$10,800
A21	Frequent Clogs at Palm Lift Station	Alt 1	\$0	NA	\$0	\$0	\$0
		Alt 2	\$101,250	20	\$0	\$0	\$101,250
A22	Bad Level Sensor at Palm Lift Station	Alt 1	\$0	NA	\$0	\$0	\$0
		Alt 2	\$31,050	20	\$0	\$0	\$31,050
A23	No Emergency Bypass Pipe at Any Lift Station	Alt 1	\$0	NA	\$0	\$0	\$0
		Alt 2	\$281,120	70	\$0	\$0	\$281,120
B1	Additional WWTP Capacity Needed	Alt 1	\$0	NA	\$0	\$0	\$0
		Alt 2	\$10,625,000	50	\$155,000	\$5,424,952	\$16,049,952
		Alt 3	\$8,710,000	50	\$10,000	\$349,997	\$9,059,997
		Alt 4	\$8,710,000	50	\$90,000	\$3,149,972	\$11,859,972
		Alt 5	\$7,468,750	50	\$80,000	\$2,799,975	\$10,268,725
		Alt 6	\$1,397,250	60	\$20,000	\$787,605	\$2,184,855
B2	New Collection System and Conveyance to Chowchilla	Alt 1	\$10,054,249	70	\$15,000	\$647,323	\$10,701,572
		Alt 2	\$9,159,199	70	\$10,000	\$431,549	\$9,590,748
		Alt 3	\$11,493,808	70	\$5,000	\$215,774	\$11,709,583
C1	Future WWTP Buildout	NA	NA	NA	NA	NA	NA
C2	New Pumps in Lift Stations	Alt 1	\$0	NA	\$0	\$0	\$0
		Alt 2	\$124,200	25	\$0	\$0	\$124,200
C3	8" Sewer Main in 15th Street	Alt 1	\$0	NA	\$0	\$0	\$0
		Alt 2	\$313,281	70	\$0	\$0	\$313,281
C4	Future Main Lines to New Development	Alt 1	\$0	NA	\$0	\$0	\$0
		Alt 2	\$13,109,840	40	\$0	\$0	\$13,109,840

## SECTION VI – PRIORITIES AND RECOMMENDED PROJECT

As mentioned above, the focus of this report is to serve as back-up documentation for a funding application requesting funds to consolidate the sewer collection of Fairmead with the City of Chowchilla. While many of the deficiencies identified are important to the City, several are unrelated to the connection of Fairmead, thus having a lower priority. This section will provide a prioritization of the suggested improvements.

Phase 1 includes the improvements recommended as part of this project. The City will seek funds for Phase 1 improvements which will serve the Fairmead residents and provide the least impact to the existing Chowchilla customers. Other Phases are intended for future use and are not essential to rectify any critical issues or to serve Fairmead. Such improvements will be paid for by future developers or by the City as the need arises.

### 6.1– Phase 1 Improvements (Recommended Project)

Phase 1 are those projects essential to the connection and long-term service of collecting and treating Fairmead’s wastewater, while continuing reliable service to the existing Chowchilla residents. At a minimum, Priorities 1 through 4 will need to be constructed as part of this phase.

#### Priority 1 – Collection System in Fairmead, Extend Existing 18-inch industrial Gravity Sewer Main and Install Lift Station and Force Main (B2, Alt. 3)

This alternative was selected since it is necessary for the collection of wastewater in Fairmead and for the conveyance to the City of Chowchilla WWTP. Out of the few alternatives available, this one includes an extension of the existing gravity sewer to the west side of HWY 99 where the proposed force main would connect. This reduces the amount of force main piping needed to convey the wastewater from Fairmead to Chowchilla, which suggests smaller pumps in the lift station, ultimately requiring less power. This alternative also has no impact on the existing 24” domestic sewer which may need its available capacity for residential areas not yet developed that plan to contribute to this line. See Figure 5-1 for proposed improvements.

#### Priority 2 – Increase Capacity of the Existing Plant (B1, Alt. 2)

The addition of Fairmead would push the existing flows to over 0.9 MGD which is the current plant capacity when one of the treatment trains is offline. The increase in plant capacity will come by construction of a new 0.9 MGD package treatment plant, which will allow the plant to operate at 1.8 MGD (for which it was originally designed and permitted) when one of the treatment trains are offline for maintenance. The package plant will generally operate in tandem with one of the existing trains which will be more efficient (less electricity and better effluent) than the two existing trains as they operate now. This alternative is selected over the others because it will provide the most reliable solution for both Fairmead and Chowchilla residents, provide redundancy at the plant during maintenance, require less manpower, and provide the best treatment result. All proposed improvements would have a footprint that fits within the property owned by the City resulting in little to no environmental impact to the surrounding area. The general process will remain the same, with the percolation ponds still being the finishing discharge method. Water will continue to not be recycled or reused for anything other than what is already stipulated in the City’s discharge permit.

### Priority 3 – Upsize Existing 10-inch Sewer Main to 24-Inch at the Intersection of Avenue 24 ½ and Road 16 (A18, Alt. 2)

With the additional flow from Fairmead being conveyed through the existing 18” industrial main, peak flows may cause a back-up where the industrial and domestic lines come together at the intersection of Avenue 24 ½ and Road 16. In an effort to mitigate any potential flow disruption, it is recommended to replace the short length of 10” pipe with 24” pipe, along with the two manholes at this location.

### Priority 4 – Install Additional Bar Screen Structure at WWTP (A1, Alt. 3)

The City recognizes that the existing bar screen is already not performing well. It is allowing pass-through of solids that cause problems and blockages further along in the treatment train. The addition of Fairmead is likely to exacerbate this issue. The installation of an additional bar screen would not only lessen the burden on the existing structure but would allow for taking one offline for thorough cleaning and maintenance. It would also increase the solids removal early on in the process, thus improving the quality of water passed on to the next stage of treatment.

## 6.2– Phase 2 Improvements

Phase 2 Improvements are those related to the existing WWTP. If funding is available, these improvements would be beneficial to both Fairmead and the City of Chowchilla for long-term reliability of the treatment and disposal process, but are not essential to extend services to Fairmead.

### Priority 5 – Replace Main Air Transmission Line and Diffusers at WWTP (A4, Alt. 2)

This project is necessary to repair an existing issue with the leaking transmission line. It will also include replacing existing diffusers with a newer type that is more efficient. The new aeration system will be automatically controlled by Dissolved Oxygen (DO) sensors that provide feedback to new Variable Frequency Drives (VFDs) on the blower motors. This not only can provide a considerable increase to the overall treatment capacity of the existing system, but will make the system more efficient and will likely use less power.

### Priority 6 – Install SCADA at WWTP (A9, Alt. 3)

This project includes the installation of Supervisory Controls and Data Acquisition (SCADA) equipment at the WWTP. The existing controls are old and, in some cases, not operational. This project will include installation of new controls and sensing equipment that will facilitate remote monitoring and operation of the equipment. This will allow staff to monitor the equipment and process on a regular schedule and would provide alerts of equipment failures, high water alarms, etc. The convenience and time savings for staff using a SCADA system over conventional manual reading and operation is significant.

### Priority 7 – Install Screw Press and Shelter to Dry Sludge (A8, Alt. 2)

This project provides the ability for the City to dry sludge during any time of the year. Historically the City has to wait through the wet months, which requires additional effort and handling of the sludge. The new screw press will allow the City a method for drying sludge in the wet months. Usage of existing drying beds would remain for warm months. This would allow staff to spend time on other tasks, and would allow for the land currently used to store wet sludge to be used for something else, if needed.

### 6.3– Phase 3 Improvements

Phase 3 improvements are projects related to other known deficiencies at the existing WWTP that are even less critical than Phase 2 improvements. Should funding be available, these projects would be beneficial in improving reliability and functionality of the existing treatment plant. The connection of Fairmead will impose an additional demand on these components, which will likely need to be replaced in the near future to avoid further issues.

#### Priority 8

- Replace Chain Scrapers (A2, Alt. 2)
- Replace Timers and Sludge Pumps (A3, Alt. 2)
- Replace Valves and/or Motors (A5, Alt. 2)
- Replace Hatches and Ladders at Digesters (A6, Alt. 2)
- Repair Digester Structure (A7, Alt. 2)
- Replace Gauges (A10, Alt. 2)

### 6.4– Phase 4 Improvements

Phase 4 improvements are related to deficiencies in the City's existing collection system that are unrelated to the connection of Fairmead. Costs for these projects will be borne by future developers or by the City as the needs arise. Costs are not included for purposes of this report.

#### Priority 9

- Upsize existing 8-inch sewer main to 10-inch located between the lots between Circle Drive and Ventura Avenue from Fifth Street to Seventh Street (A11, Alt. 2)
- Upsize existing 8-inch sewer main to 10-inch in Ninth Street at Ventura Avenue and then in the alley between Ventura Avenue and Sonoma Avenue to Eleventh Street (A12, Alt. 2)
- Upsize existing 8-inch sewer main to 10-inch in the alley between Monterey Avenue and Lake Avenue, from Tenth Street to Eleventh Street (A13, Alt. 2)
- Upsize existing 8-inch sewer main to 10-inch in the alley between Monterey Avenue and Sonoma Avenue, from Sixth Street to Seventh Street needs to be upsized to 10" (A14, Alt. 2)
- Upsize existing 15-inch sewer main to 24-inch and existing 12-inch to 18-inch in Myer Street from Kites Way to Robertson Blvd. (A15, Alt. 2)
- Upsize 10" sewer main to 12-inch that runs through the Chowchilla High School campus (A16, Alt. 2)
- Upsize existing 6" sewer main to 10-inch from the end of the line at Farnesi's Steakhouse to Chowchilla Blvd. (A17, Alt. 2)
- Install Permanent Backup Power Source at Each Lift Station (A19, Alt. 2)
- Install New Lockable Hatch (A20, Alt. 2)
- Replace Pumps in Palm Lift Station with Chopper Style Impeller (A21, Alt. 2)
- Replace Level Controls at Palm Lift Station with Ultrasonic Level Transducer (A22, Alt. 2)
- Install a Bypass Pipeline at Each Lift Station (A23, Alt. 2)

## 6.5– Phase 5 Improvements

The following improvements are related to the build-out of the City of Chowchilla General Plan and are intended to be paid for by future developers. Costs are not included for purposes of this report.

### Priority 10

- Capacity of wastewater treatment plant needs to be increased to 5.1 MGD to accommodate future build-out of the City. (C1, TBD)
- New pumps with higher capacity for all four lift stations need to be installed to accommodate future flows. (C2, Alt. 2)
- 8" sewer main in 15<sup>th</sup> Street, from the alley between Kings Avenue and Robertson Blvd. and Hoover Avenue shows likelihood of backups upon complete build-out of City. (C3, Alt. 2)
- Future main lines to serve build out of General Plan. (C4, Alt. 2)

## 6.6 – Infiltration and Inflow

Inflow and Infiltration (I&I) is a phenomenon that affects every sewer collection system. When it rains, a certain amount of the runoff finds its way into manholes and adds to the wastewater flow. Groundwater infiltration is another process that is difficult to prevent. Similar to the rain runoff, groundwater will eventually penetrate components such as pipe joints, fittings, lift stations, and manholes. Based on the condition of the system components, the I&I could range from negligible to very significant. For Chowchilla, we can examine the wet and dry season flows at the plant and draw some conclusions. Assuming wastewater flows from the service connections remains constant throughout the year, the I&I can be estimated by calculating the difference in flows between the wet and dry seasons.

Wet Season Monthly Average (November - April) = 0.862 MGD

Dry Season Monthly Average (May – October) = 0.850 MGD

Estimated I&I = 1.37 %

Since the estimated I&I is low, it is not recommended that any I&I repairs or improvements be performed as part of this project. For purposes of this report, the more critical items discussed above should be completed with any funding received.

## 6.7 – Climate Change Considerations

Due to the nature of the proposed improvements, climate change is not a major topic of concern. While temperatures do affect the treatment process, there are several ways to tailor the process to handle swings in temperature, whether that be seasonally or long-term.

## 6.8 – California Government Code, Section 65041.1

As a recipient of State planning funds and in accordance with potential funding of proposed improvements, the City has considered the guidelines outlined in Section 65041.1 of the California Government Code, which reads as follows:



*“The state planning priorities, which are intended to promote equity, strengthen the economy, protect the environment, and promote public health and safety in the state, including in urban, suburban, and rural communities, shall be as follows:*

*(a) To promote infill development and equity by rehabilitating, maintaining, and improving existing infrastructure that supports infill development and appropriate reuse and redevelopment of previously developed, underutilized land that is presently served by transit, streets, water, sewer, and other essential services, particularly in underserved areas, and to preserving cultural and historic resources.*

*(b) To protect environmental and agricultural resources by protecting, preserving, and enhancing the state’s most valuable natural resources, including working landscapes such as farm, range, and forest lands, natural lands such as wetlands, watersheds, wildlife habitats, and other wildlands, recreation lands such as parks, trails, greenbelts, and other open space, and landscapes with locally unique features and areas identified by the state as deserving special protection.*

*(c) To encourage efficient development patterns by ensuring that any infrastructure associated with development, other than infill development, supports new development that does all of the following:*

*(1) Uses land efficiently.*

*(2) Is built adjacent to existing developed areas to the extent consistent with the priorities specified pursuant to subdivision (b).*

*(3) Is located in an area appropriately planned for growth.*

*(4) Is served by adequate transportation and other essential utilities and services.*

*(5) Minimizes ongoing costs to taxpayers.”*

The proposed improvements follow the above guidelines in many respects. The extended sewer line and proposed collection system in Fairmead, will facilitate infill development within the community of Fairmead. Since there is no current wastewater collection system, all infill development would be required to install a septic system to handle wastewater flows. This may and likely will have an impact on groundwater quality in the long-term.

The Environmental Documents for this project will evaluate impact to natural resources, farmlands, wetlands, sensitive habitats, and other features listed above. It will provide recommendations to avoid these features altogether or will list mitigation measures to ensure minimal impact to these features.

The extension of the gravity main will ultimately allow some future development within the Chowchilla City limits to tie into the extended line. The items in part (c) above were considered in the alternative selection and are all satisfied to the extent possible.

## SECTION VII – RECOMMENDED PROJECT

### 7.1 – Capital Costs for Recommended Improvements

Table 7-1 contains a summary of project costs associated with the recommended project discussed above. Again, the Phase 1 project costs are those required to complete the connection of Fairmead to Chowchilla. Other Phases are for future use and are included for reference.

**Table 7-1 Summary of Costs for Recommended Improvements**

Priority	Alternative	Description of Project	Construction Costs	Engineering, Survey, Environmental, Legal, Construction Management (10-25%)	Contingency (20%)	Total Project Costs
<b>Phase 1 Improvements (Recommended Project)</b>						
1	B2, Alt. 3	Collection System in Fairmead, Extend 18-inch Industrial Gravity Sewer Main	\$8,513,932	\$1,277,090	\$1,702,786	\$11,493,808
2	B1, Alt. 2	Construct 0.9 MGD Package Treatment Plant	\$8,500,000	\$425,000	\$1,700,000	\$10,625,000
3	A18, Alt. 2	Upsize Existing 10-Inch Sewer Main to 24-Inch at Avenue 24 ½ and Road 16	\$101,150	\$15,173	\$20,230	\$136,553
4	A1, Alt. 3	Install Additional Bar Screen Structure at WWTP	\$335,000	\$50,250	\$67,000	\$452,250
<b>Total Phase 1 Improvements</b>			<b>\$17,450,082</b>	<b>\$1,767,512</b>	<b>\$3,490,016</b>	<b>\$22,707,611</b>
<b>Phase 2 Improvements</b>						
5	A4, Alt. 2	Replace Main Air Transmission Line and Diffusers at WWTP	\$505,000	\$75,750 <sup>1</sup>	\$101,000	\$681,750
6	A9, Alt. 3	Install SCADA at WWTP	\$445,000	\$111,250	\$89,000	\$645,250
7	A8, Alt. 2	Install Screw Press and Shelter to Dry Sludge	\$880,000	\$220,000	\$176,000	\$1,276,000
<b>Total Phase 2 Improvements</b>			<b>\$1,830,000</b>	<b>\$407,000</b>	<b>\$366,000</b>	<b>\$2,603,000</b>
<b>Phase 3 Improvements</b>						
8	A2, Alt. 2	Replace Chain Scrapers	\$630,000	\$63,000 <sup>1</sup>	\$126,000	\$819,000
8	A3, Alt. 2	Replace Timers and Sludge Pumps	\$75,000	\$11,250 <sup>1</sup>	\$15,000	\$101,250
8	A5, Alt. 2	Replace Valves and/or Motors	\$195,000	\$29,250 <sup>1</sup>	\$39,000	\$263,250
8	A6, Alt. 2	Replace Hatches and Ladders at Digesters	\$38,000	\$5,700 <sup>1</sup>	\$7,600	\$51,300
8	A7, Alt. 2	Repair Digester Structure	\$38,000	\$5,700 <sup>1</sup>	\$7,600	\$51,300
8	A10, Alt. 2	Replace Gauges	\$8,000	\$1,200 <sup>1</sup>	\$1,600	\$10,800
<b>Total Phase 3 Improvements</b>			<b>\$984,000</b>	<b>\$116,100</b>	<b>\$196,800</b>	<b>\$1,296,900</b>

<sup>1</sup> Soft costs for this project are less than 25% due to the nature of the project

## 7.2 – Operation and Maintenance Costs for Recommended Improvements

Table 7-2 contains a summary of the existing and proposed operation and maintenance costs for the proposed improvements. Only Phase 1 improvements are included here as other phases are not part of the recommended project.

**Table 7-2 Proposed Annual Operation and Maintenance Costs for Recommended Improvements**

Description	Existing O&M	Increase in O&M	Proposed O&M
Salaries and Benefits	\$512,580	-	\$512,580
Operations and Maintenance	\$421,037	\$164,500	\$585,537
Debt Service	\$237,951	-	\$237,951
Overhead Allocations	\$320,372	-	\$320,372
Depreciation	\$167,280	-	\$167,280
Capital Outlay	\$550,000	-	\$550,000
Transfers Out	\$156,025	-	\$156,025
<b>Total</b>	<b>\$2,365,245</b>	<b>\$164,500</b>	<b>\$2,529,745</b>

The increase in proposed O&M costs include the annual costs for filter media replacement, chemicals, additional electrical costs for the package treatment plant, lift stations and bar screen.

The rates for Chowchilla and Fairmead residents shall be determined using separate rate studies using the above estimated annual O&M costs and should not require any additional fees or assessments.

## 7.3 – Life Cycle Costs for Recommended Improvements

The Total Life Cycle costs are calculated using a base Construction Cost Index (CCI) of 11418.16 (May 2020) with an annual increase of 1.7% based on recent trends of the ENR 20-City Average. Future O&M costs, if any, are converted to present day dollars. Salvage values, if any, are also converted to present day dollars and subtracted from total life cycle costs. The 30-year Discount Rate used for these calculations is 1.5% (from OMB Circular No. A-94 APPENDIX C). Table 7-3 provides the total life cycle costs for the recommended improvements.

**Table 7-3 Life Cycle Costs for Recommended Improvements**

Priority	Alternative	Description of Project	Total Capital Costs	Useful Life (yrs)	Annual O&M (in addition to Current O&M)	Present Value of O&M over Useful Life	Total Life Cycle Cost
1	B2, Alt. 3	Collection System in Fairmead, Extend 18-inch Industrial Gravity Sewer Main	\$11,493,808	70	\$5,000	\$215,774	\$11,709,583
2	B1, Alt. 2	Construct 0.9 MGD Package Treatment Plant	\$10,625,000	50	\$155,000	\$5,424,952	\$16,049,952
3	A18, Alt. 2	Upsize Existing 10-Inch Sewer Main to 24-Inch at Avenue 24 ½ and Road 16	\$136,553	70	\$0	\$0	\$136,553
4	A1, Alt. 3	Install Additional Bar Screen Structure at WWTP	\$452,250	40	\$4,500	\$134,621	\$586,871
<b>Total Improvements</b>			<b>\$17,450,082</b>		<b>\$165,000</b>	<b>\$5,775,347</b>	<b>\$28,482,959</b>

#### 7.4 – Proposed Schedule for Recommended Improvements

Table 7-3 contains the proposed planning, design and construction phases related to the recommended improvements.

**Table 7-4 Proposed Schedule for Recommended Improvements**

Phase	Proposed Date Range
Construction Application	August 2020 – December 2021
Engineering & Design	January 2022 – December 2022
Permits	May 2022 – December 2022
Construction Bidding & Award	January 2023 – March 2023
Notice to Proceed	March 2023
Construction	April 2023 – September 2024
Commissioning & Project Closeout	September 2024 – December 2024

#### 7.5 – Project Permits or Special Approval

The Environmental Documents (IS/MND) have not yet been completed for this project, so the specifics are unknown. However, any mitigation measures outlined in the Environmental Documents will need to be addressed as part of the project. Other biological-related permits and tasks that are outside the scope of the IS/MND may include:

- Wetland delineation
- Aquatic permits (CDFW 1600, CVRWQCB 401 WQC, USACE CWA 404)
- Calif ESA Take Permit

- Central Valley Flood Protection Board Encroachment Permit

Other permits and/or processes that may be required are:

- Madera County Encroachment Permit
- City of Chowchilla Encroachment Permit
- Railroad Crossing/Encroachment Permit
- Caltrans Crossing/Encroachment Permit
- Permit to abandon existing septic systems
- Amendment to City Discharge Permit
- LAFCO Out-of-Boundary Service Agreement for MD-33
- Proposition 218 Rate Study for MD-33 Residents

## 7.6 – Key Issues

Some of the key issues that will need to be considered as part of this project are listed below. These items may impact the budget and schedule as the project further develops.

- Coordination with the variety of agencies involved during design and construction
- Time and effort to get all necessary permits in place prior to construction
- Outreach to MD-33 residents during Proposition 218 rate study process
- Coordination with landowners to abandon existing septic systems and to install on-site piping for connection to the new collection system in the street
- Long lead time of package plant equipment
- Dealing with any seasonal restraints identified in the Environmental Documents

## Appendix A

### City of Chowchilla Wastewater Collection System Map







## Appendix B

### Water Model Printouts for Scenario 2 and Scenario 4



Project Description

File Name ..... 180377\_SS\_Scenario2 18IND.SPF  
Existing + MD33

Project Options

Flow Units ..... GPM  
Elevation Type ..... Elevation  
Hydrology Method ..... Rational  
Time of Concentration (TOC) Method ..... User-Defined  
Link Routing Method ..... Kinematic Wave  
Enable Overflow Ponding at Nodes ..... YES  
Skip Steady State Analysis Time Periods ..... NO

Analysis Options

Start Analysis On ..... Nov 27, 2018 00:00:00  
End Analysis On ..... Nov 28, 2018 00:00:00  
Start Reporting On ..... Nov 27, 2018 00:00:00  
Antecedent Dry Days ..... 0 days  
Runoff (Dry Weather) Time Step ..... 0 01:00:00 days hh:mm:ss  
Runoff (Wet Weather) Time Step ..... 0 00:05:00 days hh:mm:ss  
Reporting Time Step ..... 0 00:05:00 days hh:mm:ss  
Routing Time Step ..... 30 seconds

Number of Elements

Qty  
Rain Gages ..... 0  
Subbasins..... 0  
Nodes..... 1019  
    *Junctions* ..... 1016  
    *Outfalls* ..... 3  
    *Flow Diversions* ..... 0  
    *Inlets* ..... 0  
    *Storage Nodes* ..... 0  
Links..... 1013  
    *Channels* ..... 0  
    *Pipes* ..... 1009  
    *Pumps* ..... 4  
    *Orifices* ..... 0  
    *Weirs* ..... 0  
    *Outlets* ..... 0  
Pollutants ..... 0  
Land Uses ..... 0

Rainfall Details

Return Period..... 2 year(s)

## Junction Results

Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained	Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained	Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained
	(gpm)	(gpm)	(ft)		(gpm)	(gpm)	(ft)		(gpm)	(gpm)	(ft)
Jun-01	17.70	0.00	237.09	Structure - (117) (1)	25.77	0.00	233.34	Structure - (166)	12.23	0.00	235.36
Jun-02	17.70	0.00	237.59	Structure - (118)	0.00	0.00	242.91	Structure - (166) (1)	12.25	0.00	222.40
Jun-03	17.70	0.00	241.87	Structure - (118) (1)	25.01	0.00	232.26	Structure - (167)	0.00	0.00	245.26
Jun-04	17.70	0.00	243.37	Structure - (119)	0.00	0.00	241.97	Structure - (167) (1)	12.20	0.00	221.36
Jun-05	17.70	0.00	244.75	Structure - (119) (1)	24.44	0.00	231.23	Structure - (168)	0.00	0.00	244.24
Jun-06	0.00	0.00	246.62	Structure - (120)	0.00	0.00	241.03	Structure - (168) (1)	135.24	0.00	220.19
Jun-07	0.00	0.00	248.62	Structure - (120) (1)	35.00	11.60	230.18	Structure - (169)	0.00	0.00	244.05
Jun-08	0.00	0.00	248.20	Structure - (121)	0.00	0.00	247.88	Structure - (169) (1)	0.00	0.00	222.17
Jun-09	0.00	0.00	248.81	Structure - (121) (1)	37.78	0.00	229.06	Structure - (170)	0.00	0.00	241.49
Jun-10	0.00	0.00	248.97	Structure - (122)	0.00	0.00	244.04	Structure - (170) (1)	23.40	11.80	232.31
Jun-11	0.00	0.00	249.53	Structure - (122) (1)	36.27	0.00	227.99	Structure - (171)	71.01	0.00	234.47
Jun-12	0.00	0.00	248.11	Structure - (123)	71.07	0.00	237.52	Structure - (171) (1)	25.85	0.00	231.72
Jun-13	17.70	0.00	246.85	Structure - (123) (1)	35.76	0.00	226.90	Structure - (172)	0.00	0.00	245.44
Jun-14	17.70	0.00	246.99	Structure - (124)	0.00	0.00	244.62	Structure - (172) (1)	24.14	0.00	230.93
Jun-15	5.90	0.00	247.86	Structure - (124) (1)	39.20	4.20	225.76	Structure - (173)	0.00	0.00	243.91
Jun-16	0.00	0.00	249.96	Structure - (125)	71.10	0.00	237.20	Structure - (173) (1)	23.72	0.00	230.37
Jun-17	5.90	0.00	248.55	Structure - (125) (1)	40.14	0.00	224.75	Structure - (174)	0.00	0.00	244.68
Jun-18	0.00	0.00	248.91	Structure - (126)	0.00	0.00	245.79	Structure - (174) (1)	23.76	0.00	229.33
Jun-19	0.00	0.00	249.23	Structure - (126) (1)	39.64	0.00	223.70	Structure - (175)	0.00	0.00	242.01
Jun-20	0.00	0.00	249.73	Structure - (127)	0.00	0.00	242.01	Structure - (175) (1)	23.77	0.00	228.25
Jun-21	5.90	0.00	249.24	Structure - (127) (1)	124.02	0.00	222.63	Structure - (176)	0.00	0.00	240.15
Jun-22	0.00	0.00	249.63	Structure - (128)	71.07	0.00	236.87	Structure - (176) (1)	23.79	0.00	227.15
Jun-23	5.90	0.00	250.18	Structure - (128) (1)	14.46	0.00	223.13	Structure - (177)	0.00	0.00	237.60
Jun-24	0.00	0.00	250.43	Structure - (129)	0.00	0.00	245.55	Structure - (177) (1)	23.75	0.00	226.04
Jun-25	5.90	0.00	250.22	Structure - (129) (1)	11.60	11.60	234.75	Structure - (178)	11.80	11.80	244.74
Jun-26	5.90	5.90	250.86	Structure - (130)	0.00	0.00	240.86	Structure - (178) (1)	23.62	0.00	224.87
Jun-27	0.00	0.00	252.37	Structure - (130) (1)	0.00	0.00	234.58	Structure - (179)	14.69	0.00	242.34
Jun-28	0.00	0.00	251.74	Structure - (131)	0.00	0.00	241.65	Structure - (179) (1)	23.57	0.00	223.94
Jun-29	0.00	0.00	249.10	Structure - (131) (1)	0.00	0.00	233.50	Structure - (18)	0.00	0.00	249.73
Jun-30	5.90	5.90	248.60	Structure - (132)	0.00	0.00	239.55	Structure - (180)	13.99	0.00	241.86
Jun-31	0.00	0.00	249.23	Structure - (132) (1)	0.00	0.00	233.30	Structure - (180) (1)	23.49	0.00	222.83
Jun-32	5.90	0.00	247.71	Structure - (133)	71.02	0.00	236.33	Structure - (181)	13.03	0.00	236.24
Jun-33	5.90	0.00	247.44	Structure - (133) (1)	0.00	0.00	231.43	Structure - (181) (1)	23.60	0.00	221.83
Jun-34	0.00	0.00	248.80	Structure - (134)	71.04	0.00	234.67	Structure - (182)	0.00	0.00	241.50
Jun-35	5.90	0.00	247.81	Structure - (134) (1)	0.00	0.00	230.34	Structure - (183)	11.96	0.00	237.37
Jun-36	5.90	0.00	248.74	Structure - (135)	71.28	0.00	236.49	Structure - (183) (1)	14.11	0.00	229.34
Jun-37	5.90	5.90	248.82	Structure - (135) (1)	0.00	0.00	229.30	Structure - (184)	0.00	0.00	242.89
Jun-41	5.90	0.00	248.05	Structure - (136) (1)	0.00	0.00	228.10	Structure - (184) (1)	13.22	0.00	228.31
LS #1	495.28	0.00	216.46	Structure - (137)	0.00	0.00	242.33	Structure - (185)	0.00	0.00	241.15
LS #2	200.00	0.00	211.82	Structure - (137) (1)	0.00	0.00	226.99	Structure - (185) (1)	12.47	0.00	227.20
Out-1Pipe - (592)	0.00	0.00	226.59	Structure - (138)	71.14	0.00	235.86	Structure - (186)	12.18	0.00	235.59
SSCO-2	0.00	0.00	225.94	Structure - (138) (1)	0.00	0.00	225.91	Structure - (186) (1)	12.50	0.00	226.07
SSCO-3	0.00	0.00	235.86	Structure - (139)	0.00	0.00	224.76	Structure - (187)	94.75	0.00	233.93
SSLS-3	18.71	0.00	231.78	Structure - (140) (1)	0.00	0.00	223.84	Structure - (187) (1)	12.46	0.00	225.00
SSLS-5	0.00	0.00	223.54	Structure - (141) (1)	0.00	0.00	222.83	Structure - (188)	94.76	0.00	233.63
SSMH - 1	0.00	0.00	248.16	Structure - (142) (1)	123.64	0.00	221.53	Structure - (188) (1)	12.22	0.00	223.97
Structure - (1)A	0.00	0.00	250.01	Structure - (146) (1)	0.00	0.00	232.55	Structure - (189)	94.72	0.00	233.30
Structure - (1)B	0.00	0.00	248.38	Structure - (147) (1)	0.00	0.00	232.28	Structure - (189) (1)	12.07	0.00	222.89
Structure - (100)	11.80	11.80	248.27	Structure - (148)	0.00	0.00	240.14	Structure - (19)	0.00	0.00	249.02
Structure - (101)	15.80	0.00	246.06	Structure - (148) (1)	0.00	0.00	230.42	Structure - (190)	94.75	0.00	232.97
Structure - (101) (1)	0.00	0.00	236.65	Structure - (149) (1)	0.00	0.00	229.36	Structure - (190) (1)	24.44	0.00	221.86
Structure - (102)	24.88	0.00	242.00	Structure - (150)	0.00	0.00	238.57	Structure - (191)	94.72	0.00	232.54
Structure - (102) (1)	12.91	0.00	234.62	Structure - (150) (1)	0.00	0.00	228.33	Structure - (191) (1)	47.85	0.00	221.27
Structure - (103)	23.92	0.00	239.78	Structure - (151)	71.05	0.00	234.72	Structure - (192)	119.23	0.00	233.77
Structure - (103) (1)	0.00	0.00	235.15	Structure - (151) (1)	0.00	0.00	227.17	Structure - (193)	118.70	0.00	232.06
Structure - (104)	11.80	11.80	249.69	Structure - (152) (1)	0.00	0.00	226.16	Structure - (193) (1)	15.45	0.00	228.12
Structure - (104) (1)	0.00	0.00	233.98	Structure - (153) (1)	0.00	0.00	224.57	Structure - (194)	118.45	0.00	231.46
Structure - (105)	14.73	0.00	245.87	Structure - (154)	11.80	11.80	245.33	Structure - (194) (1)	13.18	0.00	227.22
Structure - (105) (1)	0.00	0.00	232.95	Structure - (154) (1)	0.00	0.00	224.11	Structure - (195)	213.09	0.00	230.66
Structure - (106)	13.62	0.00	245.53	Structure - (155)	15.06	0.00	244.73	Structure - (195) (1)	12.69	0.00	226.15
Structure - (106) (1)	0.00	0.00	231.90	Structure - (155) (1)	0.00	0.00	223.05	Structure - (196)	94.62	0.00	234.26
Structure - (107)	36.95	0.00	241.10	Structure - (156)	13.04	0.00	243.95	Structure - (196) (1)	12.60	0.00	225.06
Structure - (107) (1)	0.00	0.00	230.74	Structure - (156) (1)	0.00	0.00	221.98	Structure - (197)	119.07	0.00	232.40
Structure - (108)	0.00	0.00	247.05	Structure - (157)	12.31	0.00	240.22	Structure - (197) (1)	12.55	0.00	224.03
Structure - (108) (1)	0.00	0.00	229.67	Structure - (157) (1)	123.55	0.00	220.83	Structure - (198)	118.45	0.00	231.14
Structure - (109)	36.37	0.00	239.61	Structure - (158)	12.31	0.00	236.24	Structure - (198) (1)	12.46	0.00	222.92
Structure - (109) (1)	0.00	0.00	228.57	Structure - (158) (1)	14.57	0.00	231.86	Structure - (199)	0.00	0.00	244.15
Structure - (110)	0.00	0.00	227.53	Structure - (159)	12.19	0.00	234.96	Structure - (199) (1)	0.00	0.00	228.45
Structure - (111)	24.01	0.00	240.27	Structure - (159) (1)	12.62	0.00	229.94	Structure - (200)	0.00	0.00	240.58
Structure - (111) (1)	0.00	0.00	226.49	Structure - (160)	94.49	0.00	234.48	Structure - (200) (1)	0.00	0.00	229.22
Structure - (112)	36.16	0.00	237.16	Structure - (160) (1)	12.49	0.00	228.82	Structure - (201)	0.00	0.00	238.70
Structure - (112) (1)	0.00	0.00	225.43	Structure - (161)	0.00	0.00	245.41	Structure - (201) (1)	0.00	0.00	230.52
Structure - (113)	0.00	0.00	243.36	Structure - (161) (1)	12.53	0.00	227.64	Structure - (202)	0.00	0.00	239.23
Structure - (113) (1)	0.00	0.00	224.38	Structure - (162)	0.00	0.00	245.98	Structure - (203)	0.00	0.00	240.87
Structure - (114)	71.20	0.00	238.20	Structure - (162) (1)	12.40	0.00	226.69	Structure - (204)	0.00	0.00	243.04
Structure - (114) (1)	71.87	0.00	221.97	Structure - (163)	12.82	0.00	240.77	Structure - (204) (1)	247.80	66.40	218.11
Structure - (115)	71.13	0.00	236.23	Structure - (163) (1)	12.04	0.00	225.57	Structure - (205)	0.00	0.00	243.94
Structure - (115) (1)	0.00	0.00	223.76	Structure - (164)	12.62	0.00	240.49	Structure - (205) (1)	135.11	0.00	218.82
Structure - (116)	71.06	0.00	237.85	Structure - (164) (1)	12.10	0.00	224.43	Structure - (206)	0.00	0.00	240.69
Structure - (116) (1)	23.40	11.80	234.51	Structure - (165)	12.22	0.00	237.47	Structure - (206) (1)	0.00	0.00	221.75
Structure - (117)	0.00	0.00	245.78	Structure - (165) (1)	12.30	0.00	223.40	Structure - (207)	0.00	0.00	239.12

## Junction Results

Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained	Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained	Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained
	(gpm)	(gpm)	(ft)		(gpm)	(gpm)	(ft)		(gpm)	(gpm)	(ft)
Structure - (207) (1)	253.47	0.00	218.13	Structure - (259)	14.04	0.00	242.89	Structure - (301)	0.00	0.00	239.42
Structure - (208)	12.76	0.00	238.37	Structure - (259) (1)	0.00	0.00	231.08	Structure - (301) (1)	0.00	0.00	229.80
Structure - (208) (1)	0.00	0.00	221.87	Structure - (26)	11.80	11.80	247.24	Structure - (302)	0.00	0.00	241.00
Structure - (209)	13.83	0.00	239.91	Structure - (260)	13.14	0.00	241.98	Structure - (303)	0.00	0.00	229.44
Structure - (21)	0.00	0.00	252.38	Structure - (260) (1)	0.00	0.00	229.15	Structure - (304)	0.00	0.00	241.24
Structure - (210)	11.80	11.80	243.58	Structure - (261)	0.00	0.00	244.07	Structure - (304) (1)	0.00	0.00	229.40
Structure - (211)	11.80	11.80	243.39	Structure - (261) (1)	0.00	0.00	227.23	Structure - (305)	0.00	0.00	239.98
Structure - (212)	15.68	0.00	239.03	Structure - (262)	12.67	0.00	240.91	Structure - (305) (1)	11.80	11.80	230.67
Structure - (213)	13.15	0.00	236.74	Structure - (262) (1)	0.00	0.00	226.83	Structure - (306)	0.00	0.00	238.66
Structure - (214)	25.04	0.00	236.34	Structure - (263)	12.65	0.00	238.32	Structure - (306) (1)	0.00	0.00	225.01
Structure - (214) (1)	14.69	0.00	226.20	Structure - (263) (1)	0.00	0.00	228.09	Structure - (307)	0.00	0.00	238.38
Structure - (215)	0.00	0.00	237.95	Structure - (264)	11.80	11.80	243.10	Structure - (307) (1)	0.00	0.00	226.51
Structure - (215) (1)	12.98	0.00	225.81	Structure - (265)	0.00	0.00	244.14	Structure - (308)	0.00	0.00	238.09
Structure - (216) (1)	0.00	0.00	225.60	Structure - (265) (1)	0.00	0.00	226.28	Structure - (308) (1)A	0.00	0.00	226.51
Structure - (217)	0.00	0.00	242.22	Structure - (266)	0.00	0.00	232.01	Structure - (308) (1)B	0.00	0.00	226.51
Structure - (217) (1)	12.70	0.00	224.90	Structure - (267)	11.80	11.80	249.15	Structure - (309)	0.00	0.00	237.57
Structure - (218)	0.00	0.00	243.67	Structure - (267) (1)	0.00	0.00	225.94	Structure - (309) (1)	0.00	0.00	226.50
Structure - (218) (1)	14.69	0.00	225.31	Structure - (268)	13.53	0.00	246.80	Structure - (310)	0.00	0.00	237.94
Structure - (219)	0.00	0.00	239.12	Structure - (268) (1)	0.00	0.00	225.52	Structure - (310) (1)	0.00	0.00	226.47
Structure - (219) (1)	25.03	0.00	224.57	Structure - (269)	12.55	0.00	244.62	Structure - (311)	0.00	0.00	237.44
Structure - (220) (1)	80.80	0.00	224.79	Structure - (269) (1)	0.00	0.00	228.86	Structure - (311) (1)	0.00	0.00	226.38
Structure - (221)	0.00	0.00	239.35	Structure - (270)	12.37	0.00	243.63	Structure - (312)	0.00	0.00	237.11
Structure - (221) (1)	96.77	0.00	224.00	Structure - (270) (1)	0.00	0.00	225.22	Structure - (312) (1)	0.00	0.00	226.84
Structure - (222)	0.00	0.00	238.56	Structure - (271)	24.54	0.00	242.65	Structure - (313)	0.00	0.00	236.45
Structure - (222) (1)	14.77	0.00	224.18	Structure - (271) (1)	0.00	0.00	228.06	Structure - (313) (1)A	0.00	0.00	230.23
Structure - (223)	0.00	0.00	239.32	Structure - (272)	24.39	0.00	237.04	Structure - (313) (1)B	0.00	0.00	230.23
Structure - (223) (1)	106.79	0.00	223.36	Structure - (272) (1)	0.00	0.00	227.71	Structure - (313) (1)C	0.00	0.00	230.23
Structure - (224)	0.00	0.00	238.61	Structure - (273)	0.00	0.00	247.02	Structure - (314)	0.00	0.00	235.72
Structure - (224) (1)	5.80	0.00	223.48	Structure - (273) (1)	0.00	0.00	227.36	Structure - (314) (1)	0.00	0.00	230.06
Structure - (225)	14.93	0.00	240.20	Structure - (274)	0.00	0.00	246.50	Structure - (315)	0.00	0.00	237.66
Structure - (225) (1)	134.87	0.00	222.89	Structure - (274) (1)	0.00	0.00	227.13	Structure - (315) (1)A	0.00	0.00	229.97
Structure - (226)	13.39	0.00	239.31	Structure - (275)	11.80	11.80	250.11	Structure - (315) (1)B	0.00	0.00	229.97
Structure - (226) (1)	14.74	0.00	223.26	Structure - (275) (1)	0.00	0.00	226.54	Structure - (316)	0.00	0.00	242.14
Structure - (227) (1)	146.02	0.00	222.30	Structure - (276)	14.36	0.00	246.13	Structure - (316) (1)	13.96	0.00	229.53
Structure - (228) (1)	79.35	0.00	222.87	Structure - (276) (1)	0.00	0.00	225.99	Structure - (317)	0.00	0.00	242.14
Structure - (229) (1)	227.98	0.00	221.63	Structure - (277)	13.18	0.00	244.13	Structure - (317) (1)	13.21	0.00	228.62
Structure - (230)	0.00	0.00	240.24	Structure - (277) (1)	0.00	0.00	228.56	Structure - (318)	0.00	0.00	238.54
Structure - (230) (1)	14.79	0.00	222.31	Structure - (278)	0.00	0.00	246.00	Structure - (318) (1)	12.50	0.00	227.98
Structure - (231)	238.50	0.00	221.52	Structure - (278) (1)	0.00	0.00	227.75	Structure - (319)	0.00	0.00	238.01
Structure - (232)	0.00	0.00	221.68	Structure - (279)	0.00	0.00	242.00	Structure - (319) (1)	12.19	0.00	227.33
Structure - (233)	235.53	0.00	220.71	Structure - (279) (1)	0.00	0.00	228.30	Structure - (32)A	0.00	0.00	250.57
Structure - (234)	14.70	0.00	221.30	Structure - (280)	12.89	0.00	245.34	Structure - (32)B	0.00	0.00	250.57
Structure - (235)	247.10	0.00	220.36	Structure - (280) (1)	0.00	0.00	227.44	Structure - (320)	0.00	0.00	242.00
Structure - (236)	158.70	0.00	221.92	Structure - (281)	12.11	0.00	243.34	Structure - (320) (1)	12.17	0.00	227.09
Structure - (237)	17.70	0.00	260.01	Structure - (281) (1)	0.00	0.00	227.03	Structure - (321)	0.00	0.00	239.30
Structure - (237) (1)	246.39	0.00	219.75	Structure - (282)	12.01	0.00	243.18	Structure - (321) (1)	12.04	0.00	226.80
Structure - (238) (1)	245.55	0.00	219.47	Structure - (282) (1)	0.00	0.00	227.40	Structure - (322)	0.00	0.00	238.35
Structure - (238)A	0.00	0.00	236.96	Structure - (283)	24.55	0.00	242.21	Structure - (322) (1)	0.00	0.00	225.17
Structure - (238)B	0.00	0.00	236.96	Structure - (283) (1)	0.00	0.00	226.61	Structure - (323)	0.00	0.00	239.18
Structure - (239)	0.00	0.00	248.50	Structure - (284)	24.47	0.00	239.47	Structure - (323) (1)	0.00	0.00	223.96
Structure - (239) (1)	245.15	0.00	218.81	Structure - (284) (1)	0.00	0.00	227.47	Structure - (324)	0.00	0.00	239.27
Structure - (240)	0.00	0.00	246.00	Structure - (285)	24.43	0.00	237.68	Structure - (324) (1)	0.00	0.00	222.74
Structure - (240) (1)	244.64	0.00	218.23	Structure - (285) (1)	0.00	0.00	227.13	Structure - (325)	0.00	0.00	241.14
Structure - (241)	0.00	0.00	238.67	Structure - (286)	24.33	0.00	236.86	Structure - (325) (1)	0.00	0.00	220.59
Structure - (241) (1)	495.52	0.00	217.38	Structure - (286) (1)	0.00	0.00	226.56	Structure - (326)	0.00	0.00	239.60
Structure - (242) (1)	12.05	0.00	225.51	Structure - (287)	0.00	0.00	236.64	Structure - (326) (1)	18.78	0.00	219.33
Structure - (243) (1)	254.24	0.00	216.92	Structure - (287) (1)	0.00	0.00	225.46	Structure - (327)	0.00	0.00	238.99
Structure - (244) (1)	13.17	0.00	234.91	Structure - (288)	0.00	0.00	235.97	Structure - (327) (1)	0.00	0.00	229.15
Structure - (245)	0.00	0.00	248.24	Structure - (289)	0.00	0.00	235.20	Structure - (328)	0.00	0.00	237.71
Structure - (245) (1)	13.10	0.00	232.73	Structure - (29)	12.29	0.00	245.61	Structure - (328) (1)	0.00	0.00	228.48
Structure - (246)	0.00	0.00	247.95	Structure - (290)	0.00	0.00	234.70	Structure - (329)	0.00	0.00	236.77
Structure - (246) (1)	12.50	0.00	231.95	Structure - (290) (1)	0.00	0.00	233.19	Structure - (329) (1)	0.00	0.00	229.35
Structure - (247)	0.00	0.00	246.94	Structure - (291)	0.00	0.00	237.40	Structure - (330)	0.00	0.00	236.33
Structure - (247) (1)	12.46	0.00	231.27	Structure - (291) (1)	0.00	0.00	232.17	Structure - (330) (1)	0.00	0.00	228.69
Structure - (248)	11.80	11.80	235.94	Structure - (292)	0.00	0.00	234.34	Structure - (331)	0.00	0.00	235.56
Structure - (250)	0.00	0.00	236.35	Structure - (292) (1)	0.00	0.00	231.01	Structure - (331) (1)	0.00	0.00	227.86
Structure - (250) (1)	11.80	0.00	235.77	Structure - (293)	0.00	0.00	233.92	Structure - (332)	0.00	0.00	235.00
Structure - (251)	36.36	0.00	236.18	Structure - (293) (1)	0.00	0.00	230.07	Structure - (333)	0.00	0.00	234.55
Structure - (252)	35.91	0.00	235.47	Structure - (294)	0.00	0.00	233.80	Structure - (333) (1)	0.00	0.00	228.11
Structure - (253)	35.88	0.00	234.87	Structure - (294) (1)B	0.00	0.00	229.80	Structure - (334)	11.80	11.80	248.34
Structure - (253) (1)	0.00	0.00	236.19	Structure - (295)	0.00	0.00	241.50	Structure - (334) (1)	11.97	0.00	226.38
Structure - (254)	35.74	0.00	234.26	Structure - (295) (1)	0.00	0.00	229.31	Structure - (335)	14.81	0.00	247.40
Structure - (254) (1)	0.00	0.00	231.61	Structure - (296)	0.00	0.00	239.39	Structure - (335) (1)	0.00	0.00	224.13
Structure - (255)	0.00	0.00	236.07	Structure - (296) (1)	0.00	0.00	229.01	Structure - (336)	12.63	0.00	246.09
Structure - (255) (1)	0.00	0.00	232.31	Structure - (297)	0.00	0.00	239.43	Structure - (336) (1)A	0.00	0.00	223.50
Structure - (256)	36.03	0.00	235.67	Structure - (297) (1)	0.00	0.00	224.15	Structure - (336) (1)B	0.00	0.00	223.50
Structure - (256) (1)	0.00	0.00	227.74	Structure - (298)	0.00	0.00	241.50	Structure - (337)	12.34	0.00	245.24
Structure - (257)	35.84	0.00	234.73	Structure - (298) (1)	0.00	0.00	223.98	Structure - (337) (1)	0.00	0.00	222.92
Structure - (257) (1)	0.00	0.00	229.25	Structure - (299)	0.00	0.00	238.69	Structure - (338)	12.17	0.00	244.31
Structure - (258)	0.00	0.00	244.81	Structure - (3)	0.00	0.00	247.14	Structure - (338) (1)	0.00	0.00	222.38
Structure - (258) (1)	0.00	0.00	234.53	Structure - (300)	0.00	0.00	238.94	Structure - (339)	23.72	0.00	243.54

## Junction Results

Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained	Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained	Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained
(gpm)	(gpm)	(ft)		(gpm)	(gpm)	(ft)		(gpm)	(gpm)	(ft)	
Structure - (339) (1)	0.00	0.00	221.82	Structure - (380)	94.86	0.00	230.29	Structure - (420)	12.61	0.00	237.99
Structure - (340)	23.65	0.00	242.57	Structure - (380) (1)	0.00	0.00	222.56	Structure - (420) (1)	0.00	0.00	220.32
Structure - (340) (1)	0.00	0.00	222.15	Structure - (381)	35.72	0.00	233.70	Structure - (421)	0.00	0.00	219.54
Structure - (341)	23.66	0.00	241.37	Structure - (381) (1)	9.00	9.00	223.66	Structure - (422)	81.75	0.00	219.28
Structure - (341) (1)	9.00	9.00	221.86	Structure - (382)	35.71	0.00	233.65	Structure - (424)	0.00	0.00	248.36
Structure - (342)	59.34	0.00	233.59	Structure - (382) (1)	11.14	0.00	222.73	Structure - (424) (1)	0.00	0.00	221.16
Structure - (342) (1)	11.39	0.00	221.22	Structure - (383)	59.15	0.00	232.75	Structure - (425)	0.00	0.00	249.76
Structure - (343)	13.11	0.00	246.61	Structure - (383) (1)	10.26	0.00	221.38	Structure - (425) (1)A	0.00	0.00	220.70
Structure - (343) (1)	10.19	0.00	223.44	Structure - (384)	83.41	0.00	231.39	Structure - (425) (1)B	0.00	0.00	220.70
Structure - (344)	12.46	0.00	245.44	Structure - (384) (1)	36.66	0.00	220.53	Structure - (426)	0.00	0.00	247.12
Structure - (344) (1)	18.80	0.00	220.28	Structure - (385)	0.00	0.00	239.14	Structure - (426) (1)	0.00	0.00	220.06
Structure - (345)	12.32	0.00	245.17	Structure - (385) (1)	11.34	0.00	221.61	Structure - (427)	0.00	0.00	244.62
Structure - (345) (1)	0.00	0.00	225.10	Structure - (386)	0.00	0.00	241.51	Structure - (427) (1)	0.00	0.00	219.64
Structure - (346)	12.20	0.00	244.38	Structure - (386) (1)	9.00	9.00	222.71	Structure - (428)	0.00	0.00	252.40
Structure - (346) (1)	11.47	0.00	225.35	Structure - (387)	12.87	0.00	240.35	Structure - (428) (1)	0.00	0.00	219.19
Structure - (347)	12.15	0.00	244.14	Structure - (387) (1)	0.00	0.00	224.13	Structure - (429)	0.00	0.00	247.58
Structure - (347) (1)	9.00	9.00	226.25	Structure - (388)	13.28	0.00	239.33	Structure - (429) (1)	0.00	0.00	218.69
Structure - (348)	12.11	0.00	243.62	Structure - (389)	25.25	0.00	238.56	Structure - (430)	12.54	0.00	246.87
Structure - (349)	23.66	0.00	242.95	Structure - (389) (1)	9.00	9.00	222.37	Structure - (430) (1)	0.00	0.00	218.45
Structure - (349) (1)	0.00	0.00	221.85	Structure - (39)	0.00	0.00	248.68	Structure - (431)	12.11	0.00	246.47
Structure - (35)	0.00	0.00	250.31	Structure - (390)	25.10	0.00	234.02	Structure - (431) (1)	0.00	0.00	220.49
Structure - (350)	23.65	0.00	242.39	Structure - (390) (1)	10.94	0.00	221.34	Structure - (432)	12.06	0.00	244.74
Structure - (350) (1)	0.00	0.00	221.25	Structure - (391)	0.00	0.00	244.02	Structure - (432) (1)	0.00	0.00	220.10
Structure - (351)	23.70	0.00	241.50	Structure - (391) (1)	45.92	0.00	220.24	Structure - (433)	0.00	0.00	250.11
Structure - (351) (1)	0.00	0.00	220.32	Structure - (392)	11.80	11.80	243.09	Structure - (433) (1)	0.00	0.00	219.54
Structure - (352)	23.65	0.00	234.40	Structure - (392) (1)	9.00	9.00	221.58	Structure - (434)	0.00	0.00	250.39
Structure - (352) (1)	0.00	0.00	219.78	Structure - (393)	0.00	0.00	242.03	Structure - (434) (1)	0.00	0.00	219.34
Structure - (353)	23.64	0.00	233.76	Structure - (393) (1)	56.87	0.00	219.95	Structure - (435)	0.00	0.00	250.47
Structure - (353) (1)	0.00	0.00	219.35	Structure - (394)	11.80	11.80	241.09	Structure - (435) (1)	81.60	0.00	218.87
Structure - (354)	0.00	0.00	218.86	Structure - (394) (1)	0.00	0.00	222.63	Structure - (436)	0.00	0.00	249.70
Structure - (355)	11.80	11.80	248.31	Structure - (395)	0.00	0.00	222.01	Structure - (436) (1)	81.31	0.00	218.66
Structure - (355) (1)	0.00	0.00	218.50	Structure - (396) (1)	0.00	0.00	222.62	Structure - (437)	0.00	0.00	249.42
Structure - (356)	14.96	0.00	247.20	Structure - (396)A	0.00	0.00	243.50	Structure - (437) (1)	81.22	0.00	218.43
Structure - (356) (1)	0.00	0.00	217.76	Structure - (396)B	0.00	0.00	243.50	Structure - (438)	0.00	0.00	249.00
Structure - (357)	12.54	0.00	244.95	Structure - (397)	0.00	0.00	242.27	Structure - (438) (1)	81.16	0.00	218.20
Structure - (357) (1)	0.00	0.00	217.28	Structure - (397) (1)	0.00	0.00	222.20	Structure - (439)	0.00	0.00	248.05
Structure - (358)	11.82	0.00	244.75	Structure - (398)	0.00	0.00	241.13	Structure - (439) (1)	0.00	0.00	220.34
Structure - (358) (1)	0.00	0.00	216.98	Structure - (398) (1)	0.00	0.00	221.01	Structure - (440)	0.00	0.00	247.58
Structure - (359)	0.00	0.00	245.19	Structure - (399)	0.00	0.00	241.03	Structure - (440) (1)	81.17	0.00	217.77
Structure - (359) (1)	100.63	0.00	216.66	Structure - (399) (1)	9.00	9.00	223.27	Structure - (441)	0.00	0.00	245.93
Structure - (36)	0.00	0.00	250.11	Structure - (40)	0.00	0.00	247.10	Structure - (441) (1)	9.00	9.00	217.83
Structure - (360)	0.00	0.00	246.14	Structure - (400)	0.00	0.00	239.60	Structure - (442)	12.52	0.00	242.38
Structure - (360) (1)	0.00	0.00	222.19	Structure - (400) (1)	11.84	0.00	221.29	Structure - (442) (1)	92.91	0.00	217.47
Structure - (361)	0.00	0.00	248.12	Structure - (401)	0.00	0.00	240.34	Structure - (443)	13.72	0.00	242.99
Structure - (361) (1)	0.00	0.00	220.23	Structure - (401) (1)	10.23	0.00	220.49	Structure - (443) (1)	91.07	0.00	217.01
Structure - (362)	13.46	0.00	246.36	Structure - (402)	0.00	0.00	239.27	Structure - (444)	0.00	0.00	247.41
Structure - (362) (1)	0.00	0.00	221.98	Structure - (402) (1)	81.64	0.00	219.49	Structure - (445)	0.00	0.00	248.06
Structure - (363)	13.07	0.00	245.83	Structure - (403)	0.00	0.00	238.75	Structure - (445) (1)	99.71	0.00	216.29
Structure - (363) (1)	0.00	0.00	222.70	Structure - (403) (1)	0.00	0.00	223.87	Structure - (446)	0.00	0.00	248.81
Structure - (364)	12.76	0.00	245.19	Structure - (404)	0.00	0.00	237.87	Structure - (446) (1)	99.54	0.00	216.17
Structure - (364) (1)	9.00	9.00	219.50	Structure - (404) (1)	0.00	0.00	223.00	Structure - (447)	99.51	0.00	216.05
Structure - (365)	12.27	0.00	244.87	Structure - (405)	0.00	0.00	237.57	Structure - (448)	212.99	0.00	229.81
Structure - (366)	12.15	0.00	244.86	Structure - (405) (1)	10.48	0.00	222.38	Structure - (448) (1)	99.98	0.00	214.38
Structure - (366) (1)	0.00	0.00	222.55	Structure - (406)	0.00	0.00	236.81	Structure - (449)	213.43	0.00	228.64
Structure - (367)	12.03	0.00	244.83	Structure - (406) (1)	9.00	9.00	223.28	Structure - (449) (1)	99.54	0.00	214.22
Structure - (367) (1)	0.00	0.00	222.39	Structure - (407)	12.11	0.00	236.00	Structure - (450)	213.38	0.00	228.24
Structure - (368)	11.93	0.00	244.80	Structure - (407) (1)	0.00	0.00	222.63	Structure - (450) (1)	99.17	0.00	213.84
Structure - (368) (1)	0.00	0.00	222.29	Structure - (408)	12.15	0.00	235.32	Structure - (451)	213.32	0.00	227.88
Structure - (369)	11.85	0.00	244.79	Structure - (408) (1)	9.98	0.00	221.71	Structure - (451) (1)	99.12	0.00	213.82
Structure - (369) (1)	9.00	9.00	228.97	Structure - (409)	12.23	0.00	235.92	Structure - (452)	213.19	0.00	227.40
Structure - (370)	11.83	0.00	244.75	Structure - (409) (1)	9.00	9.00	222.08	Structure - (453)	261.50	0.00	226.91
Structure - (370) (1)	12.12	0.00	227.79	Structure - (41)	0.00	0.00	245.56	Structure - (453) (1)	99.31	0.00	214.06
Structure - (371)	11.88	0.00	244.22	Structure - (410)	12.33	0.00	236.62	Structure - (454)	0.00	0.00	231.34
Structure - (371) (1)	10.54	0.00	226.78	Structure - (410) (1)	19.91	0.00	221.20	Structure - (454) (1)	99.21	0.00	213.92
Structure - (372)	11.87	0.00	243.90	Structure - (411)	12.48	0.00	237.53	Structure - (455)	22.40	22.40	231.10
Structure - (372) (1)	9.99	0.00	225.50	Structure - (411) (1)	0.00	0.00	221.45	Structure - (455) (1)	99.17	0.00	212.72
Structure - (373)	0.00	0.00	245.27	Structure - (412) (1)	19.39	0.00	220.53	Structure - (456)	22.40	0.00	231.08
Structure - (373) (1)	9.91	0.00	223.15	Structure - (413)	13.20	0.00	239.22	Structure - (456) (1)	99.16	0.00	211.67
Structure - (374)	0.00	0.00	234.33	Structure - (413) (1)	18.78	0.00	220.09	Structure - (457)	26.53	0.00	230.91
Structure - (374) (1)	9.00	9.00	223.95	Structure - (414)	14.56	0.00	240.13	Structure - (458)	25.39	0.00	230.52
Structure - (375)	59.31	0.00	233.03	Structure - (414) (1)	18.67	0.00	219.84	Structure - (458) (1)	9.00	9.00	222.51
Structure - (375) (1)A	12.06	0.00	222.81	Structure - (415)	11.80	11.80	240.87	Structure - (459)	24.54	0.00	230.12
Structure - (375) (1)B	0.00	0.00	222.72	Structure - (415) (1)	18.33	0.00	219.46	Structure - (459) (1)A	0.00	0.00	222.37
Structure - (376)	59.05	0.00	232.43	Structure - (416)	0.00	0.00	240.11	Structure - (459) (1)B	11.52	0.00	222.46
Structure - (376) (1)	10.15	0.00	221.97	Structure - (416) (1)	0.00	0.00	222.75	Structure - (460)	24.10	0.00	229.72
Structure - (377)	83.30	0.00	232.70	Structure - (417)	0.00	0.00	241.24	Structure - (460) (1)	18.00	0.00	220.86
Structure - (377) (1)	9.54	0.00	221.30	Structure - (417) (1)	0.00	0.00	221.45	Structure - (461)	23.82	0.00	229.32
Structure - (378)	95.06	0.00	234.51	Structure - (418)	0.00	0.00	242.37	Structure - (461) (1)	19.40	0.00	219.62
Structure - (378) (1)	19.12	0.00	220.66	Structure - (418) (1)	0.00	0.00	220.18	Structure - (462)	23.62	0.00	228.93
Structure - (379)	94.91	0.00	230.80	Structure - (419)	0.00	0.00	241.63	Structure - (462) (1)	18.89	0.00	218.39
Structure - (379) (1)	0.00	0.00	221.58	Structure - (419) (1)	0.00	0.00	220.96	Structure - (463)	23.47	0.00	228.53

## Junction Results

Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained	Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained	Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained
	(gpm)	(gpm)	(ft)		(gpm)	(gpm)	(ft)		(gpm)	(gpm)	(ft)
Structure - (463) (1)	18.50	0.00	217.15	Structure - (503) (1)	0.00	0.00	218.14	Structure - (546)	1.00	1.00	228.01
Structure - (464)	23.35	0.00	228.13	Structure - (504)	0.00	0.00	239.46	Structure - (547)	11.12	0.00	220.53
Structure - (464) (1)	27.30	0.00	216.49	Structure - (504) (1)	9.00	9.00	218.62	Structure - (549)	0.00	0.00	234.45
Structure - (465)	23.26	0.00	227.71	Structure - (505)	261.38	0.00	226.69	Structure - (55)	0.00	0.00	249.76
Structure - (465) (1)	9.00	9.00	221.05	Structure - (506)	260.45	0.00	226.36	Structure - (55) (1)	24.48	0.00	230.71
Structure - (466)	44.80	22.40	227.37	Structure - (506) (1)	38.65	0.00	217.14	Structure - (550)	0.00	0.00	232.99
Structure - (467)	51.59	0.00	226.98	Structure - (507)	259.06	0.00	226.00	Structure - (551)	11.60	11.60	237.72
Structure - (467) (1)	9.00	9.00	221.68	Structure - (507) (1)	38.25	0.00	213.61	Structure - (552)	14.70	0.00	236.58
Structure - (468)	0.00	0.00	236.67	Structure - (508)	258.40	0.00	225.52	Structure - (553)	12.77	0.00	235.75
Structure - (468) (1)	11.53	0.00	220.76	Structure - (508) (1)	37.13	0.00	212.82	Structure - (554)	12.05	0.00	234.69
Structure - (469)	0.00	0.00	236.81	Structure - (509)	258.31	0.00	225.04	Structure - (555)	11.98	0.00	234.20
Structure - (469) (1)	9.87	0.00	219.77	Structure - (509) (1)	36.94	0.00	211.97	Structure - (556)	11.97	0.00	233.54
Structure - (470)	0.00	0.00	235.58	Structure - (51)	14.18	0.00	246.74	Structure - (557)	0.00	0.00	235.53
Structure - (470) (1)	9.52	0.00	218.77	Structure - (51) (1)	14.81	0.00	234.94	Structure - (558)	0.00	0.00	235.94
Structure - (471)	0.00	0.00	235.51	Structure - (510)	258.23	0.00	224.10	Structure - (559)	0.00	0.00	235.52
Structure - (471) (1)	9.27	0.00	217.79	Structure - (511)	258.13	0.00	224.08	Structure - (56)	0.00	0.00	250.23
Structure - (472)	0.00	0.00	235.15	Structure - (511) (1)	10.16	0.00	219.45	Structure - (56) (1)	24.12	0.00	229.99
Structure - (472) (1)	9.25	0.00	217.31	Structure - (512)	258.04	0.00	223.60	Structure - (560)	12.34	0.00	235.38
Structure - (473)	0.00	0.00	234.85	Structure - (512) (1)	9.45	0.00	218.27	Structure - (562)	11.80	11.80	226.52
Structure - (473) (1)	0.00	0.00	220.69	Structure - (513)	257.98	0.00	223.12	Structure - (563)	0.00	0.00	226.33
Structure - (474)	0.00	0.00	234.55	Structure - (513) (1)	0.00	0.00	218.31	Structure - (564)	11.80	11.80	225.93
Structure - (474) (1)	0.00	0.00	219.83	Structure - (514)	257.93	0.00	222.67	Structure - (565)	66.40	66.40	225.49
Structure - (475)	0.00	0.00	234.34	Structure - (514) (1)	0.00	0.00	217.42	Structure - (566)	11.80	11.80	225.03
Structure - (475) (1)	0.00	0.00	217.70	Structure - (515)	258.64	0.00	225.74	Structure - (567)	5.80	5.80	224.23
Structure - (476)	0.00	0.00	233.98	Structure - (515) (1)	37.99	0.00	213.45	Structure - (568)	11.80	11.80	224.32
Structure - (476) (1)	3.20	0.00	227.81	Structure - (516)	258.53	0.00	225.65	Structure - (569)	66.40	66.40	224.18
Structure - (477)	0.00	0.00	233.39	Structure - (516) (1)	37.40	0.00	213.04	Structure - (57)	0.00	0.00	250.69
Structure - (477) (1)	30.45	0.00	214.72	Structure - (517)	797.27	0.00	222.91	Structure - (57) (1)	23.93	0.00	228.28
Structure - (478)	0.00	0.00	232.91	Structure - (518)	73.16	0.00	225.41	Structure - (570)	11.80	11.80	223.37
Structure - (478) (1)	41.80	11.60	214.13	Structure - (518) (1)	11.80	11.80	223.45	Structure - (571)	0.00	0.00	221.70
Structure - (479)	0.00	0.00	232.91	Structure - (519) (1)	15.59	0.00	222.38	Structure - (572)	11.80	11.80	222.14
Structure - (479) (1)	44.44	0.00	213.42	Structure - (519)B	67.20	22.40	225.77	Structure - (573)	0.00	0.00	225.24
Structure - (480)	0.00	0.00	232.36	Structure - (52)	12.80	0.00	247.64	Structure - (574)	0.00	0.00	224.53
Structure - (480) (1)	43.10	0.00	212.68	Structure - (52) (1)	13.09	0.00	233.77	Structure - (575)	0.00	0.00	224.03
Structure - (481)	0.00	0.00	231.91	Structure - (520) (1)	13.47	0.00	221.73	Structure - (576)	11.60	11.60	223.59
Structure - (481) (1)	53.40	11.60	212.50	Structure - (521)	47.22	0.00	230.84	Structure - (577)	0.00	0.00	225.17
Structure - (482)	0.00	0.00	231.41	Structure - (521) (1)	0.00	0.00	223.34	Structure - (578)	0.00	0.00	228.06
Structure - (482) (1)	56.17	0.00	211.88	Structure - (522)	44.80	22.40	233.25	Structure - (579)	0.00	0.00	227.19
Structure - (483)	0.00	0.00	236.31	Structure - (522) (1)	0.00	0.00	222.82	Structure - (58)	24.86	0.00	227.27
Structure - (483) (1)	164.00	11.60	211.36	Structure - (523)	29.56	0.00	233.91	Structure - (580)	0.00	0.00	240.14
Structure - (484)	0.00	0.00	235.78	Structure - (523) (1)	0.00	0.00	222.03	Structure - (581)	11.80	11.80	235.78
Structure - (484) (1)	3.20	0.00	215.83	Structure - (524)	22.40	22.40	234.50	Structure - (582)	11.80	11.80	230.16
Structure - (485)	30.47	0.00	215.02	Structure - (524) (1)	0.00	0.00	223.74	Structure - (583)	11.80	11.80	233.51
Structure - (486)	0.00	0.00	238.80	Structure - (525) (1)	0.00	0.00	222.75	Structure - (585)	0.00	0.00	230.18
Structure - (486) (1)	3.20	3.20	229.57	Structure - (526)	51.82	0.00	232.25	Structure - (586)	11.80	11.80	230.00
Structure - (487)	0.00	0.00	237.97	Structure - (526) (1)	0.00	0.00	221.97	Structure - (587)	9.00	9.00	218.69
Structure - (487) (1)	9.00	9.00	222.30	Structure - (527)	22.40	22.40	231.24	Structure - (588)	11.35	0.00	217.63
Structure - (488)	0.00	0.00	237.25	Structure - (527) (1)	0.00	0.00	222.45	Structure - (589)	10.43	0.00	217.47
Structure - (488) (1)	10.07	0.00	221.95	Structure - (528)	28.78	0.00	230.71	Structure - (59)	0.00	0.00	252.63
Structure - (489)	0.00	0.00	237.62	Structure - (528) (1)	0.00	0.00	223.16	Structure - (59) (1)	36.56	0.00	225.40
Structure - (489) (1)	10.16	0.00	220.93	Structure - (529)	24.78	0.00	230.18	Structure - (592)	0.00	0.00	226.74
Structure - (490)	0.00	0.00	238.30	Structure - (529) (1)	0.00	0.00	221.95	Structure - (60)	0.00	0.00	251.22
Structure - (490) (1)	9.89	0.00	220.31	Structure - (53)	12.53	0.00	232.55	Structure - (606)	0.00	0.00	217.80
Structure - (491)	0.00	0.00	238.99	Structure - (530)	23.49	0.00	229.90	Structure - (609)	11.80	11.80	229.83
Structure - (491) (1)	9.45	0.00	219.58	Structure - (530) (1)	0.00	0.00	222.62	Structure - (61)	0.00	0.00	250.29
Structure - (492)	0.00	0.00	233.54	Structure - (531)	23.62	0.00	229.88	Structure - (610)	0.00	0.00	232.60
Structure - (492) (1)	9.26	0.00	218.65	Structure - (531) (1)	0.00	0.00	221.10	Structure - (611)	0.00	0.00	233.54
Structure - (493)	0.00	0.00	234.06	Structure - (533)	23.53	0.00	230.04	Structure - (612)	11.80	11.80	235.13
Structure - (493) (1)	9.17	0.00	218.55	Structure - (533) (1)	0.00	0.00	220.13	Structure - (615)	0.00	0.00	222.64
Structure - (494)	0.00	0.00	234.79	Structure - (534)	449.40	22.40	229.87	Structure - (62)	0.00	0.00	249.83
Structure - (494) (1)	18.35	0.00	217.90	Structure - (534) (1)	0.00	0.00	227.83	Structure - (620)	0.00	0.00	217.86
Structure - (495)	0.00	0.00	235.03	Structure - (535)	359.80	359.80	233.13	Structure - (622)	0.00	0.00	224.20
Structure - (495) (1)	18.38	0.00	216.65	Structure - (535) (1)	0.00	0.00	224.40	Structure - (623)	0.00	0.00	224.99
Structure - (496)	0.00	0.00	235.45	Structure - (536)	453.07	22.40	230.46	Structure - (626)	0.00	0.00	222.26
Structure - (496) (1)	18.38	0.00	215.98	Structure - (536) (1)	0.00	0.00	223.13	Structure - (627)	18.71	0.00	218.92
Structure - (497)	0.00	0.00	235.73	Structure - (537)	420.79	0.00	230.28	Structure - (63)	0.00	0.00	247.74
Structure - (497) (1)	18.16	0.00	215.19	Structure - (537) (1)	0.00	0.00	224.05	Structure - (65)	0.00	0.00	226.29
Structure - (498)	0.00	0.00	235.89	Structure - (538)	420.57	22.40	229.65	Structure - (66)	11.80	11.80	243.31
Structure - (498) (1)	29.47	0.00	217.59	Structure - (538) (1)	0.00	0.00	223.28	Structure - (66) (1)	14.02	0.00	235.19
Structure - (499)	0.00	0.00	236.29	Structure - (539)	416.88	0.00	229.53	Structure - (67)	12.29	0.00	243.24
Structure - (499) (1)	0.00	0.00	221.78	Structure - (539) (1)	14.92	0.00	225.09	Structure - (67) (1)	13.14	0.00	234.00
Structure - (5)	0.00	0.00	245.52	Structure - (54)	0.00	0.00	249.28	Structure - (68)	12.93	0.00	242.70
Structure - (50)	11.80	11.80	249.41	Structure - (54) (1)	12.49	0.00	231.51	Structure - (68) (1)	12.40	0.00	232.96
Structure - (50) (1)	11.80	11.80	235.93	Structure - (540)	471.80	22.40	229.47	Structure - (69)	35.87	0.00	243.09
Structure - (500)	0.00	0.00	237.34	Structure - (540) (1)	13.24	0.00	224.52	Structure - (69) (1)	12.44	0.00	231.85
Structure - (500) (1)	9.00	9.00	222.14	Structure - (541)	472.59	0.00	223.05	Structure - (7)	12.17	0.00	244.01
Structure - (501)	0.00	0.00	237.61	Structure - (541) (1)	23.40	11.60	223.77	Structure - (70)	35.83	0.00	241.62
Structure - (501) (1)	9.96	0.00	219.04	Structure - (542)	11.80	11.80	225.85	Structure - (70) (1)	12.22	0.00	230.83
Structure - (502)	0.00	0.00	238.11	Structure - (543)	0.00	0.00	224.65	Structure - (71)	35.77	0.00	241.37
Structure - (502) (1)	0.00	0.00	219.50	Structure - (544)	0.00	0.00	227.64	Structure - (71) (1)	12.04	0.00	229.70
Structure - (503)	0.00	0.00	238.27	Structure - (545)	0.00	0.00	227.26	Structure - (72)	36.04	0.00	240.77

## Junction Results

Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained
	(gpm)	(gpm)	(ft)
Structure - (72) (1)	11.91	0.00	228.13
Structure - (73)	36.35	0.00	240.25
Structure - (73) (1)	12.39	0.00	227.60
Structure - (74)	36.23	0.00	239.70
Structure - (74) (1)	11.99	0.00	226.50
Structure - (75)	36.37	0.00	239.15
Structure - (75) (1)	48.30	0.00	224.73
Structure - (76)	36.04	0.00	238.60
Structure - (76) (1)	0.00	0.00	226.47
Structure - (77)	36.25	0.00	238.06
Structure - (78)	36.21	0.00	237.51
Structure - (78) (1)	14.26	0.00	233.31
Structure - (79)	36.16	0.00	237.33
Structure - (79) (1)	13.25	0.00	232.19
Structure - (80)	36.02	0.00	237.02
Structure - (80) (1)	12.56	0.00	231.13
Structure - (81)	12.74	0.00	230.01
Structure - (82)	12.51	0.00	229.01
Structure - (83)	12.20	0.00	227.95
Structure - (84)	12.12	0.00	226.86
Structure - (85)	12.20	0.00	225.77
Structure - (86)	60.10	0.00	224.73
Structure - (87)	12.08	0.00	234.70
Structure - (88)	12.63	0.00	233.73
Structure - (89)	12.74	0.00	232.62
Structure - (90)	12.24	0.00	231.50
Structure - (91)	12.54	0.00	230.45
Structure - (92)	0.00	0.00	250.87
Structure - (92) (1)	12.38	0.00	229.29
Structure - (93)	0.00	0.00	248.68
Structure - (93) (1)	12.31	0.00	228.24
Structure - (94)	71.35	0.00	236.89
Structure - (94) (1)	12.36	0.00	227.23
Structure - (95)	36.00	0.00	236.90
Structure - (95) (1)	12.18	0.00	226.24
Structure - (96)	35.95	0.00	236.69
Structure - (96) (1)	12.13	0.00	225.20
Structure - (97)	11.80	11.80	251.78
Structure - (97) (1)	71.89	0.00	224.07
Structure - (97.5)	15.66	0.00	248.04
Structure - (98)	13.55	0.00	245.67
Structure - (98) (1)	11.80	11.80	233.94
Structure - (99)	12.77	0.00	243.55
Structure - (294) (1)A	0.00	0.00	229.91

Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained
	(gpm)	(gpm)	(ft)

Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained
	(gpm)	(gpm)	(ft)

## Pipe Results

Element ID	Peak Flow (gpm)	Peak Flow Velocity (ft/sec)	Peak Flow Depth/ Total Depth Ratio	Element ID	Peak Flow (gpm)	Peak Flow Velocity (ft/sec)	Peak Flow Depth/ Total Depth Ratio	Element ID	Peak Flow (gpm)	Peak Flow Velocity (ft/sec)	Peak Flow Depth/ Total Depth Ratio
Link-02	17.70	0.87	0.06	Pipe - (115)	0.00	0.00	0.00	Pipe - (160)	0.00	0.00	0.00
Link-03	17.70	0.96	0.06	Pipe - (115) (1)	40.14	1.42	0.24	Pipe - (160) (1)	24.14	1.28	0.18
Link-04	17.70	0.81	0.07	Pipe - (116)	71.14	1.38	0.20	Pipe - (161)	0.00	0.00	0.00
Link-05	17.70	0.75	0.07	Pipe - (116) (1)	39.64	1.41	0.24	Pipe - (161) (1)	23.72	1.24	0.18
Link-06	0.00	0.00	0.00	Pipe - (117)	71.07	1.38	0.20	Pipe - (162)	0.00	0.00	0.00
Link-07	0.00	0.00	0.00	Pipe - (117) (1)	39.46	1.42	0.24	Pipe - (162) (1)	23.76	1.25	0.18
Link-08	0.00	0.00	0.00	Pipe - (118)	0.00	0.00	0.00	Pipe - (163)	71.01	1.37	0.20
Link-09	0.00	0.00	0.00	Pipe - (118) (1)	14.46	1.17	0.14	Pipe - (163) (1)	23.77	1.24	0.18
Link-10	0.00	0.00	0.00	Pipe - (119)	0.00	0.00	0.00	Pipe - (164)	70.99	1.37	0.20
Link-11	0.00	0.00	0.00	Pipe - (119) (1)	12.91	0.98	0.15	Pipe - (164) (1)	23.79	1.24	0.18
Link-12	0.00	0.00	0.00	Pipe - (120)	71.10	1.38	0.20	Pipe - (165)	0.00	0.00	0.00
Link-13	0.00	0.00	0.00	Pipe - (120) (1)	12.84	1.23	0.13	Pipe - (165) (1)	23.75	1.24	0.18
Link-14	17.70	2.14	0.03	Pipe - (121)	0.00	0.00	0.00	Pipe - (166)	0.00	0.00	0.00
Link-15	17.70	0.73	0.07	Pipe - (121) (1)	0.00	0.00	0.00	Pipe - (166) (1)	23.62	1.25	0.18
Link-16	5.90	0.63	0.04	Pipe - (122)	71.07	1.38	0.20	Pipe - (167)	0.00	0.00	0.00
Link-17	5.90	0.63	0.04	Pipe - (122) (1)	0.00	0.00	0.00	Pipe - (167) (1)	23.57	1.15	0.19
Link-18	0.00	0.00	0.00	Pipe - (123)	0.00	0.00	0.00	Pipe - (168)	0.00	0.00	0.00
Link-19	0.00	0.00	0.00	Pipe - (124)	0.00	0.00	0.00	Pipe - (168) (1)	23.49	1.23	0.18
Link-20	0.00	0.00	0.00	Pipe - (125)	0.00	0.00	0.00	Pipe - (169)	0.00	0.00	0.00
Link-21	0.00	0.00	0.00	Pipe - (126)	0.00	0.00	0.00	Pipe - (169) (1)	23.60	1.19	0.18
Link-22	5.90	0.64	0.04	Pipe - (126) (1)	0.00	0.00	0.00	Pipe - (170)	0.00	0.00	0.00
Link-23	0.00	0.00	0.00	Pipe - (127)	0.00	0.00	0.00	Pipe - (170) (1)	14.11	1.31	0.13
Link-24	5.90	0.64	0.04	Pipe - (128)	0.00	0.00	0.00	Pipe - (171)	0.00	0.00	0.00
Link-25	0.00	0.00	0.00	Pipe - (129)	0.00	0.00	0.00	Pipe - (171) (1)	13.22	1.15	0.14
Link-26	5.90	0.52	0.04	Pipe - (13) (1)	0.00	0.00	0.00	Pipe - (172)	13.03	1.22	0.12
Link-27	5.90	0.64	0.04	Pipe - (130)	0.00	0.00	0.00	Pipe - (172) (1)	12.47	1.10	0.13
Link-28	0.00	0.00	0.00	Pipe - (131)	0.00	0.00	0.00	Pipe - (173)	12.18	1.18	0.12
Link-29	0.00	0.00	0.00	Pipe - (131) (1)	0.00	0.00	0.00	Pipe - (173) (1)	12.50	1.08	0.13
Link-30	0.00	0.00	0.00	Pipe - (132)	0.00	0.00	0.00	Pipe - (174)	11.96	1.12	0.12
Link-31	0.00	0.00	0.00	Pipe - (133)	0.00	0.00	0.00	Pipe - (174) (1)	12.46	1.07	0.13
Link-32	5.90	0.61	0.04	Pipe - (133) (1)	0.00	0.00	0.00	Pipe - (175)	11.88	1.19	0.12
Link-33	5.90	0.66	0.04	Pipe - (134)	0.00	0.00	0.00	Pipe - (175) (1)	12.22	1.04	0.13
Link-34	5.90	0.52	0.04	Pipe - (135)	0.00	0.00	0.00	Pipe - (176)	0.00	0.00	0.00
Link-35	5.90	0.53	0.04	Pipe - (136)	0.00	0.00	0.00	Pipe - (176) (1)	12.07	1.05	0.13
Link-36	0.00	0.00	0.00	Pipe - (136) (1)	0.00	0.00	0.00	Pipe - (177)	14.69	2.02	0.10
Link-37	5.90	0.66	0.04	Pipe - (137)	0.00	0.00	0.00	Pipe - (177) (1)	12.02	1.05	0.13
Link-38	5.90	0.52	0.04	Pipe - (137) (1)	0.00	0.00	0.00	Pipe - (178)	13.99	1.63	0.11
Link-42	17.70	0.90	0.06	Pipe - (138)	0.00	0.00	0.00	Pipe - (178) (1)	23.56	1.22	0.18
Link-43	5.90	0.61	0.04	Pipe - (139)	0.00	0.00	0.00	Pipe - (179)	0.00	0.00	0.00
Link-44	800.89	2.35	0.46	Pipe - (139) (1)	0.00	0.00	0.00	Pipe - (179) (1)	24.37	1.28	0.18
Link-45	0.00	0.00	0.00	Pipe - (14)	0.00	0.00	0.00	Pipe - (18)	0.00	0.00	0.00
Link-46	0.00	0.00	0.00	Pipe - (140)	0.00	0.00	0.00	Pipe - (180)	94.62	1.49	0.24
Link-47	0.00	0.00	0.00	Pipe - (140) (1)	0.00	0.00	0.00	Pipe - (180) (1)	15.45	1.43	0.13
Link-48	0.00	0.00	0.00	Pipe - (141)	0.00	0.00	0.00	Pipe - (181)	94.75	1.50	0.24
Link-50	0.00	0.00	0.00	Pipe - (141) (1)	0.00	0.00	0.00	Pipe - (181) (1)	13.18	1.06	0.14
Link-51	0.00	0.00	0.00	Pipe - (142)	71.05	1.38	0.20	Pipe - (182)	94.76	1.49	0.24
Link-52	0.00	0.00	0.00	Pipe - (142) (1)	0.00	0.00	0.00	Pipe - (182) (1)	12.69	1.09	0.13
Link-53	0.00	0.00	0.00	Pipe - (143)	71.04	1.37	0.20	Pipe - (183)	94.72	1.49	0.24
Link-54	0.00	0.00	0.00	Pipe - (143) (1)	0.00	0.00	0.00	Pipe - (183) (1)	12.60	1.10	0.13
Link-55	0.00	0.00	0.00	Pipe - (144)	0.00	0.00	0.00	Pipe - (184)	94.75	1.49	0.24
Link-56	0.00	0.00	0.00	Pipe - (145)	71.02	1.37	0.20	Pipe - (184) (1)	12.55	1.07	0.13
Link-57	0.00	0.00	0.00	Pipe - (145) (1)	0.00	0.00	0.00	Pipe - (185)	94.72	1.49	0.24
Link-59	0.00	0.00	0.00	Pipe - (146)	14.57	1.69	0.11	Pipe - (185) (1)	12.46	1.07	0.13
Link-60	0.00	0.00	0.00	Pipe - (147)	15.06	1.19	0.14	Pipe - (186)	94.73	1.49	0.24
Link-61	0.00	0.00	0.00	Pipe - (147) (1)	12.62	1.36	0.12	Pipe - (186) (1)	12.41	1.05	0.13
Link-63	0.00	0.00	0.00	Pipe - (148)	13.04	1.74	0.10	Pipe - (187)	119.07	1.59	0.26
Pipe - (100)	0.00	0.00	0.00	Pipe - (148) (1)	12.49	1.11	0.13	Pipe - (187) (1)	0.00	0.00	0.00
Pipe - (100) (1)	0.00	0.00	0.00	Pipe - (149)	12.82	0.92	0.15	Pipe - (188)	118.70	1.60	0.26
Pipe - (101)	36.16	1.63	0.20	Pipe - (149) (1)	12.53	1.09	0.13	Pipe - (188) (1)	0.00	0.00	0.00
Pipe - (101) (1)	0.00	0.00	0.00	Pipe - (15)	0.00	0.00	0.00	Pipe - (189)	118.45	1.61	0.26
Pipe - (102)	35.95	1.61	0.20	Pipe - (150)	12.62	0.95	0.14	Pipe - (189) (1)	0.00	0.00	0.00
Pipe - (102) (1)	0.00	0.00	0.00	Pipe - (150) (1)	12.40	1.01	0.14	Pipe - (19)	0.00	0.00	0.00
Pipe - (104)	71.28	1.38	0.20	Pipe - (151)	12.31	0.89	0.15	Pipe - (190)	118.45	1.60	0.26
Pipe - (105)	0.00	0.00	0.00	Pipe - (151) (1)	12.04	1.07	0.13	Pipe - (190) (1)	48.16	1.51	0.19
Pipe - (106)	0.00	0.00	0.00	Pipe - (152)	12.22	1.12	0.12	Pipe - (191)	118.41	1.60	0.26
Pipe - (107)	71.20	1.38	0.20	Pipe - (152) (1)	12.10	1.10	0.13	Pipe - (191) (1)	0.00	0.00	0.00
Pipe - (107) (1)	25.77	1.52	0.18	Pipe - (153)	12.31	1.18	0.12	Pipe - (192)	0.00	0.00	0.00
Pipe - (108)	0.00	0.00	0.00	Pipe - (153) (1)	12.30	1.05	0.13	Pipe - (192) (1)	0.00	0.00	0.00
Pipe - (108) (1)	25.01	1.35	0.19	Pipe - (154)	12.23	1.16	0.12	Pipe - (193)	0.00	0.00	0.00
Pipe - (109)	0.00	0.00	0.00	Pipe - (154) (1)	12.25	1.02	0.13	Pipe - (193) (1)	0.00	0.00	0.00
Pipe - (109) (1)	24.44	1.30	0.19	Pipe - (155)	12.19	1.12	0.12	Pipe - (194)	0.00	0.00	0.00
Pipe - (110)	71.13	1.38	0.20	Pipe - (155) (1)	12.20	1.02	0.13	Pipe - (194) (1)	0.00	0.00	0.00
Pipe - (110) (1)	24.38	1.27	0.18	Pipe - (156)	12.11	1.21	0.12	Pipe - (195)	0.00	0.00	0.00
Pipe - (111)	71.06	1.38	0.20	Pipe - (156) (1)	12.09	1.08	0.13	Pipe - (195) (1)	14.69	1.17	0.14
Pipe - (111) (1)	37.78	1.53	0.22	Pipe - (157)	0.00	0.00	0.00	Pipe - (196)	0.00	0.00	0.00
Pipe - (112)	0.00	0.00	0.00	Pipe - (157) (1)	0.00	0.00	0.00	Pipe - (196) (1)	12.98	0.99	0.15
Pipe - (112) (1)	36.27	1.40	0.23	Pipe - (158)	0.00	0.00	0.00	Pipe - (197)	0.00	0.00	0.00
Pipe - (113)	0.00	0.00	0.00	Pipe - (158) (1)	0.00	0.00	0.00	Pipe - (198)	0.00	0.00	0.00
Pipe - (113) (1)	35.76	1.40	0.22	Pipe - (159)	0.00	0.00	0.00	Pipe - (198) (1)	0.00	0.00	0.00
Pipe - (114)	0.00	0.00	0.00	Pipe - (159) (1)	25.85	1.29	0.19	Pipe - (199)	0.00	0.00	0.00
Pipe - (114) (1)	35.70	1.43	0.22	Pipe - (16)	0.00	0.00	0.00	Pipe - (199) (1)	14.69	1.20	0.14



## Pipe Results

Element ID	Peak Flow (gpm)	Peak Flow Velocity (ft/sec)	Peak Flow Depth/ Total Depth Ratio	Element ID	Peak Flow (gpm)	Peak Flow Velocity (ft/sec)	Peak Flow Depth/ Total Depth Ratio	Element ID	Peak Flow (gpm)	Peak Flow Velocity (ft/sec)	Peak Flow Depth/ Total Depth Ratio
Pipe - (2) (1)	0.00	0.00	0.00	Pipe - (244)	35.74	1.15	0.15	Pipe - (283)	0.00	0.00	0.00
Pipe - (20)	12.54	1.41	0.12	Pipe - (244) (1)	135.11	1.62	0.21	Pipe - (283) (1)	0.00	0.00	0.00
Pipe - (200)	0.00	0.00	0.00	Pipe - (245)	14.04	1.21	0.21	Pipe - (284)	0.00	0.00	0.00
Pipe - (200) (1)	13.07	1.01	0.15	Pipe - (245) (1)	135.04	1.62	0.21	Pipe - (284) (1)	0.00	0.00	0.00
Pipe - (201)	0.00	0.00	0.00	Pipe - (246)	0.00	0.00	0.00	Pipe - (285)	0.00	0.00	0.00
Pipe - (201) (1)	80.80	2.08	0.33	Pipe - (246) (1)	253.47	2.05	0.28	Pipe - (285) (1)	0.00	0.00	0.00
Pipe - (202)	0.00	0.00	0.00	Pipe - (247)	0.00	0.00	0.00	Pipe - (286)	0.00	0.00	0.00
Pipe - (202) (1)	74.31	1.73	0.34	Pipe - (247) (1)	254.24	2.17	0.27	Pipe - (286) (1)	0.00	0.00	0.00
Pipe - (203)	0.00	0.00	0.00	Pipe - (248)	13.14	1.15	0.13	Pipe - (287)	0.00	0.00	0.00
Pipe - (203) (1)	14.77	1.36	0.13	Pipe - (248) (1)	250.87	1.96	0.29	Pipe - (287) (1)	0.00	0.00	0.00
Pipe - (204)	0.00	0.00	0.00	Pipe - (249)	12.67	1.10	0.13	Pipe - (288)	0.00	0.00	0.00
Pipe - (204) (1)	13.11	1.11	0.14	Pipe - (249) (1)	0.00	0.00	0.00	Pipe - (288) (1)	0.00	0.00	0.00
Pipe - (205)	0.00	0.00	0.00	Pipe - (250)	12.65	2.92	0.06	Pipe - (289)	0.00	0.00	0.00
Pipe - (205) (1)	5.80	0.72	0.10	Pipe - (250) (1)	13.17	1.22	0.13	Pipe - (289) (1)	0.00	0.00	0.00
Pipe - (206)	0.00	0.00	0.00	Pipe - (251)	12.64	2.29	0.08	Pipe - (29)	0.00	0.00	0.00
Pipe - (206) (1)	5.80	0.72	0.10	Pipe - (251) (1)	13.10	1.18	0.13	Pipe - (290)	0.00	0.00	0.00
Pipe - (207)	0.00	0.00	0.00	Pipe - (252)	0.00	0.00	0.00	Pipe - (290) (1)	0.00	0.00	0.00
Pipe - (207) (1)	14.74	1.46	0.13	Pipe - (252) (1)	12.50	0.97	0.14	Pipe - (291)	0.00	0.00	0.00
Pipe - (208)	14.93	2.10	0.10	Pipe - (253)	13.53	2.00	0.14	Pipe - (291) (1)	0.00	0.00	0.00
Pipe - (208) (1)	12.96	1.19	0.13	Pipe - (253) (1)	12.46	0.95	0.15	Pipe - (292)	0.00	0.00	0.00
Pipe - (209)	13.83	1.55	0.11	Pipe - (254)	12.89	1.63	0.10	Pipe - (292) (1)	0.00	0.00	0.00
Pipe - (209) (1)	79.35	2.54	0.28	Pipe - (254) (1)	12.35	0.92	0.15	Pipe - (293)	0.00	0.00	0.00
Pipe - (21)	12.11	1.19	0.12	Pipe - (255)	12.55	1.56	0.10	Pipe - (294)	0.00	0.00	0.00
Pipe - (210)	13.39	1.28	0.12	Pipe - (255) (1)	11.80	1.20	0.13	Pipe - (295)	0.00	0.00	0.00
Pipe - (210) (1)	73.88	2.14	0.29	Pipe - (256)	12.37	1.13	0.13	Pipe - (296)	0.00	0.00	0.00
Pipe - (211)	12.76	1.26	0.12	Pipe - (256) (1)	0.00	0.00	0.00	Pipe - (297)	0.00	0.00	0.00
Pipe - (211) (1)	14.79	1.44	0.13	Pipe - (257)	12.11	1.04	0.13	Pipe - (298)	0.00	0.00	0.00
Pipe - (212)	12.27	1.25	0.12	Pipe - (257) (1)	0.00	0.00	0.00	Pipe - (299)	0.00	0.00	0.00
Pipe - (212) (1)	13.12	1.18	0.13	Pipe - (258)	12.01	1.03	0.13	Pipe - (299) (1)	0.00	0.00	0.00
Pipe - (213)	0.00	0.00	0.00	Pipe - (258) (1)	0.00	0.00	0.00	Pipe - (3)	0.00	0.00	0.00
Pipe - (214)	0.00	0.00	0.00	Pipe - (259)	11.95	1.07	0.13	Pipe - (30)	0.00	0.00	0.00
Pipe - (215)	15.68	2.07	0.10	Pipe - (259) (1)	0.00	0.00	0.00	Pipe - (300)	0.00	0.00	0.00
Pipe - (215) (1)	14.70	1.32	0.13	Pipe - (26)	0.00	0.00	0.00	Pipe - (300) (1)	0.00	0.00	0.00
Pipe - (216)	13.15	1.45	0.12	Pipe - (260)	24.55	2.32	0.12	Pipe - (301)	0.00	0.00	0.00
Pipe - (216) (1)	13.08	1.10	0.14	Pipe - (260) (1)	0.00	0.00	0.00	Pipe - (301) (1)	0.00	0.00	0.00
Pipe - (217)	12.70	0.95	0.15	Pipe - (261)	24.47	2.35	0.12	Pipe - (302)	0.00	0.00	0.00
Pipe - (218)	12.99	1.23	0.12	Pipe - (261) (1)	0.00	0.00	0.00	Pipe - (302) (1)	0.00	0.00	0.00
Pipe - (218) (1)	12.35	0.94	0.15	Pipe - (262)	24.43	2.33	0.12	Pipe - (303)	0.00	0.00	0.00
Pipe - (219)	0.00	0.00	0.00	Pipe - (262) (1)	0.00	0.00	0.00	Pipe - (303) (1)	0.00	0.00	0.00
Pipe - (219) (1)	24.37	1.10	0.20	Pipe - (263)	24.39	2.32	0.12	Pipe - (304)	0.00	0.00	0.00
Pipe - (22)	12.29	1.24	0.12	Pipe - (263) (1)	0.00	0.00	0.00	Pipe - (304) (1)	0.00	0.00	0.00
Pipe - (220)	0.00	0.00	0.00	Pipe - (264)	24.33	1.14	0.20	Pipe - (305)	0.00	0.00	0.00
Pipe - (220) (1)	94.58	1.63	0.41	Pipe - (264) (1)	0.00	0.00	0.00	Pipe - (305) (1)	0.00	0.00	0.00
Pipe - (221)	0.00	0.00	0.00	Pipe - (265)	24.59	1.18	0.20	Pipe - (306)	0.00	0.00	0.00
Pipe - (221) (1)	105.55	1.66	0.44	Pipe - (265) (1)	0.00	0.00	0.00	Pipe - (306) (1)	0.00	0.00	0.00
Pipe - (222)	24.82	1.53	0.16	Pipe - (266)	0.00	0.00	0.00	Pipe - (307)	0.00	0.00	0.00
Pipe - (222) (1)	133.08	1.72	0.50	Pipe - (266) (1)	0.00	0.00	0.00	Pipe - (307) (1)	0.00	0.00	0.00
Pipe - (223)	145.36	1.76	0.52	Pipe - (267)	0.00	0.00	0.00	Pipe - (308)	0.00	0.00	0.00
Pipe - (224)	157.65	1.80	0.55	Pipe - (267) (1)	0.00	0.00	0.00	Pipe - (309)	0.00	0.00	0.00
Pipe - (225)	225.38	1.93	0.71	Pipe - (268)	14.36	2.11	0.14	Pipe - (309) (1)	0.00	0.00	0.00
Pipe - (226)	235.53	1.97	0.50	Pipe - (268) (1)	0.00	0.00	0.00	Pipe - (310)	0.00	0.00	0.00
Pipe - (227)	234.92	1.97	0.50	Pipe - (269)	13.18	1.41	0.17	Pipe - (310) (1)	0.00	0.00	0.00
Pipe - (228)	246.39	1.97	0.51	Pipe - (269) (1)	0.00	0.00	0.00	Pipe - (311)	0.00	0.00	0.00
Pipe - (229)	245.55	1.97	0.51	Pipe - (27)	0.00	0.00	0.00	Pipe - (311) (1)	0.00	0.00	0.00
Pipe - (23)	12.06	1.16	0.12	Pipe - (270)	12.60	1.14	0.13	Pipe - (312)	0.00	0.00	0.00
Pipe - (230) (1)	245.15	1.98	0.51	Pipe - (270) (1)	0.00	0.00	0.00	Pipe - (312) (1)	0.00	0.00	0.00
Pipe - (231)	0.00	0.00	0.00	Pipe - (271)	0.00	0.00	0.00	Pipe - (313)	0.00	0.00	0.00
Pipe - (231) (1)	244.64	1.98	0.51	Pipe - (271) (1)	0.00	0.00	0.00	Pipe - (313) (1)	0.00	0.00	0.00
Pipe - (232)	0.00	0.00	0.00	Pipe - (272)	0.00	0.00	0.00	Pipe - (314)	0.00	0.00	0.00
Pipe - (232) (1)	245.13	1.99	0.51	Pipe - (272) (1)	0.00	0.00	0.00	Pipe - (315)	0.00	0.00	0.00
Pipe - (233)	0.00	0.00	0.00	Pipe - (273)	0.00	0.00	0.00	Pipe - (315) (1)	0.00	0.00	0.00
Pipe - (234)	0.00	0.00	0.00	Pipe - (273) (1)	0.00	0.00	0.00	Pipe - (316)	0.00	0.00	0.00
Pipe - (235)	0.00	0.00	0.00	Pipe - (274)	0.00	0.00	0.00	Pipe - (316) (1)	0.00	0.00	0.00
Pipe - (235) (1)	12.06	0.95	0.10	Pipe - (274) (1)	0.00	0.00	0.00	Pipe - (317)	0.00	0.00	0.00
Pipe - (236)	0.00	0.00	0.00	Pipe - (275)	0.00	0.00	0.00	Pipe - (317) (1)	13.21	1.09	0.14
Pipe - (236) (1)	36.51	1.21	0.18	Pipe - (275) (1)	0.00	0.00	0.00	Pipe - (318)	14.81	1.32	0.13
Pipe - (237)	0.00	0.00	0.00	Pipe - (276)	0.00	0.00	0.00	Pipe - (318) (1)	12.50	0.98	0.14
Pipe - (237) (1)	48.29	1.33	0.21	Pipe - (276) (1)	0.00	0.00	0.00	Pipe - (319)	13.11	1.13	0.13
Pipe - (238)	0.00	0.00	0.00	Pipe - (277)	0.00	0.00	0.00	Pipe - (319) (1)	12.19	0.97	0.14
Pipe - (238) (1)	60.08	1.35	0.24	Pipe - (277) (1)	0.00	0.00	0.00	Pipe - (32)	0.00	0.00	0.00
Pipe - (239)	0.00	0.00	0.00	Pipe - (278)	0.00	0.00	0.00	Pipe - (320)	12.63	1.09	0.13
Pipe - (239) (1)	71.87	1.55	0.19	Pipe - (278) (1)	0.00	0.00	0.00	Pipe - (320) (1)	12.17	0.88	0.15
Pipe - (24)	12.17	1.14	0.12	Pipe - (279)	0.00	0.00	0.00	Pipe - (321)	12.46	1.05	0.14
Pipe - (240)	36.03	1.13	0.15	Pipe - (279) (1)	0.00	0.00	0.00	Pipe - (321) (1)	12.04	0.88	0.14
Pipe - (240) (1)	71.87	1.41	0.21	Pipe - (28)	0.00	0.00	0.00	Pipe - (322)	12.34	0.89	0.15
Pipe - (241)	35.91	1.14	0.15	Pipe - (280)	0.00	0.00	0.00	Pipe - (323)	12.32	1.01	0.13
Pipe - (241) (1)	123.64	1.98	0.23	Pipe - (280) (1)	0.00	0.00	0.00	Pipe - (324)	12.20	1.12	0.12
Pipe - (242)	35.88	1.18	0.15	Pipe - (281)	0.00	0.00	0.00	Pipe - (325)	12.17	1.01	0.13
Pipe - (242) (1)	123.55	1.64	0.20	Pipe - (281) (1)	0.00	0.00	0.00	Pipe - (326)	12.15	0.99	0.13
Pipe - (243)	35.84	1.13	0.15	Pipe - (282)	0.00	0.00	0.00	Pipe - (326) (1)	0.00	0.00	0.00
Pipe - (243) (1)	123.41	1.58	0.20	Pipe - (282) (1)	0.00	0.00	0.00	Pipe - (327)	12.11	1.04	0.13

## Pipe Results

Element ID	Peak Flow (gpm)	Peak Flow Velocity (ft/sec)	Peak Flow Depth/ Total Depth Ratio	Element ID	Peak Flow (gpm)	Peak Flow Velocity (ft/sec)	Peak Flow Depth/ Total Depth Ratio	Element ID	Peak Flow (gpm)	Peak Flow Velocity (ft/sec)	Peak Flow Depth/ Total Depth Ratio
Pipe - (327) (1)	0.00	0.00	0.00	Pipe - (369)	94.91	1.43	0.14	Pipe - (408) (1)	0.00	0.00	0.00
Pipe - (328)	12.06	1.06	0.13	Pipe - (369) (1)	0.00	0.00	0.00	Pipe - (409)	212.99	1.81	0.21
Pipe - (328) (1)	0.00	0.00	0.00	Pipe - (37)	0.00	0.00	0.00	Pipe - (409) (1)	10.54	1.42	0.15
Pipe - (329)	23.66	1.22	0.19	Pipe - (370)	94.86	1.43	0.14	Pipe - (41)	0.00	0.00	0.00
Pipe - (329) (1)	0.00	0.00	0.00	Pipe - (370) (1)	0.00	0.00	0.00	Pipe - (410)	213.43	1.83	0.21
Pipe - (33)	0.00	0.00	0.00	Pipe - (371)	94.82	1.45	0.14	Pipe - (410) (1)	0.00	0.00	0.00
Pipe - (330)	23.65	1.20	0.18	Pipe - (371) (1)	0.00	0.00	0.00	Pipe - (411)	213.38	1.81	0.21
Pipe - (330) (1)	0.00	0.00	0.00	Pipe - (372)	0.00	0.00	0.00	Pipe - (412)	213.32	1.81	0.21
Pipe - (331)	23.65	1.20	0.18	Pipe - (372) (1)	0.00	0.00	0.00	Pipe - (412) (1)	9.98	0.92	0.13
Pipe - (331) (1)	18.71	1.06	0.18	Pipe - (373)	0.00	0.00	0.00	Pipe - (413)	213.19	1.81	0.21
Pipe - (332)	23.70	1.26	0.18	Pipe - (373) (1)	0.00	0.00	0.00	Pipe - (413) (1)	9.54	0.88	0.13
Pipe - (333)	23.66	1.24	0.18	Pipe - (374)	13.28	1.22	0.13	Pipe - (414)	213.14	1.81	0.21
Pipe - (333) (1)	0.00	0.00	0.00	Pipe - (374) (1)	0.00	0.00	0.00	Pipe - (414) (1)	19.39	1.05	0.18
Pipe - (334)	23.65	1.57	0.15	Pipe - (375)	12.65	1.16	0.13	Pipe - (415)	0.00	0.00	0.00
Pipe - (334) (1)	0.00	0.00	0.00	Pipe - (375) (1)	0.00	0.00	0.00	Pipe - (415) (1)	18.78	0.98	0.13
Pipe - (335)	23.64	1.61	0.15	Pipe - (376)	10.16	2.20	0.08	Pipe - (416)	22.40	1.12	0.07
Pipe - (335) (1)	0.00	0.00	0.00	Pipe - (376) (1)	25.10	1.35	0.18	Pipe - (416) (1)	18.67	0.98	0.13
Pipe - (336)	23.64	1.53	0.16	Pipe - (377)	24.30	1.33	0.18	Pipe - (417)	26.53	1.20	0.07
Pipe - (337)	0.00	0.00	0.00	Pipe - (377) (1)	12.12	1.45	0.11	Pipe - (417) (1)	18.33	1.01	0.13
Pipe - (338)	0.00	0.00	0.00	Pipe - (378)	0.00	0.00	0.00	Pipe - (418)	25.39	1.11	0.07
Pipe - (339)	14.96	1.41	0.13	Pipe - (378) (1)	10.54	1.14	0.12	Pipe - (418) (1)	18.26	1.01	0.13
Pipe - (339) (1)	0.00	0.00	0.00	Pipe - (379)	12.87	2.35	0.13	Pipe - (419)	24.54	1.03	0.07
Pipe - (34)	0.00	0.00	0.00	Pipe - (379) (1)	9.99	1.11	0.11	Pipe - (419) (1)	0.00	0.00	0.00
Pipe - (340)	13.46	1.28	0.12	Pipe - (38)	0.00	0.00	0.00	Pipe - (42)	14.18	2.08	0.10
Pipe - (340) (1)	11.97	0.92	0.14	Pipe - (380)	0.00	0.00	0.00	Pipe - (42) (1)	14.81	1.41	0.13
Pipe - (341)	13.07	1.27	0.12	Pipe - (380) (1)	9.91	1.46	0.09	Pipe - (420)	24.10	0.98	0.07
Pipe - (341) (1)	12.05	0.95	0.14	Pipe - (381)	13.25	2.17	0.14	Pipe - (420) (1)	0.00	0.00	0.00
Pipe - (342)	12.76	1.26	0.12	Pipe - (381) (1)	9.90	1.70	0.06	Pipe - (421)	23.82	0.98	0.07
Pipe - (342) (1)	13.96	1.39	0.19	Pipe - (382) (1)	12.06	1.45	0.11	Pipe - (421) (1)	0.00	0.00	0.00
Pipe - (343)	12.54	1.24	0.12	Pipe - (383)	0.00	0.00	0.00	Pipe - (422)	23.62	0.97	0.07
Pipe - (343) (1)	0.00	0.00	0.00	Pipe - (383) (1)	10.15	0.98	0.13	Pipe - (422) (1)	0.00	0.00	0.00
Pipe - (344)	12.27	0.90	0.15	Pipe - (384)	0.00	0.00	0.00	Pipe - (423)	23.47	0.96	0.07
Pipe - (345)	12.15	0.86	0.15	Pipe - (384) (1)	9.54	0.96	0.12	Pipe - (423) (1)	0.00	0.00	0.00
Pipe - (345) (1)	0.00	0.00	0.00	Pipe - (385)	0.00	0.00	0.00	Pipe - (424)	23.35	0.95	0.07
Pipe - (346)	12.03	0.87	0.14	Pipe - (385) (1)	9.54	0.95	0.12	Pipe - (424) (1)	0.00	0.00	0.00
Pipe - (346) (1)	0.00	0.00	0.00	Pipe - (386)	0.00	0.00	0.00	Pipe - (425)	23.26	0.95	0.07
Pipe - (347)	11.93	0.86	0.14	Pipe - (386) (1)	0.00	0.00	0.00	Pipe - (425) (1)	19.01	0.99	0.14
Pipe - (347) (1)	0.00	0.00	0.00	Pipe - (387)	0.00	0.00	0.00	Pipe - (426)	23.18	0.95	0.07
Pipe - (348)	11.85	0.85	0.14	Pipe - (387) (1)	0.00	0.00	0.00	Pipe - (426) (1)	36.50	1.18	0.19
Pipe - (348) (1)	0.00	0.00	0.00	Pipe - (388)	0.00	0.00	0.00	Pipe - (427)	51.59	1.37	0.10
Pipe - (349)	11.83	0.86	0.14	Pipe - (388) (1)	0.00	0.00	0.00	Pipe - (427) (1)	45.67	1.28	0.21
Pipe - (349) (1)	0.00	0.00	0.00	Pipe - (389)	0.00	0.00	0.00	Pipe - (428)	49.10	1.45	0.09
Pipe - (35)	0.00	0.00	0.00	Pipe - (389) (1)	11.14	1.52	0.10	Pipe - (428) (1)	55.01	1.32	0.23
Pipe - (350)	11.82	0.85	0.14	Pipe - (39)	0.00	0.00	0.00	Pipe - (429)	0.00	0.00	0.00
Pipe - (350) (1)	11.39	1.22	0.12	Pipe - (390)	0.00	0.00	0.00	Pipe - (429) (1)	0.00	0.00	0.00
Pipe - (351)	11.88	1.00	0.13	Pipe - (390) (1)	10.26	1.12	0.12	Pipe - (43)	12.80	1.38	0.12
Pipe - (351) (1)	10.19	0.88	0.13	Pipe - (391)	0.00	0.00	0.00	Pipe - (43) (1)	13.09	1.15	0.13
Pipe - (352)	11.87	1.01	0.13	Pipe - (391) (1)	9.77	0.99	0.12	Pipe - (430)	0.00	0.00	0.00
Pipe - (352) (1)	9.49	1.01	0.12	Pipe - (392)	0.00	0.00	0.00	Pipe - (431)	0.00	0.00	0.00
Pipe - (353)	11.86	1.00	0.13	Pipe - (392) (1)	11.34	1.54	0.10	Pipe - (431) (1)	0.00	0.00	0.00
Pipe - (353) (1)	0.00	0.00	0.00	Pipe - (393)	12.08	0.99	0.13	Pipe - (432)	0.00	0.00	0.00
Pipe - (354)	0.00	0.00	0.00	Pipe - (393) (1)	10.12	1.27	0.11	Pipe - (432) (1)	0.00	0.00	0.00
Pipe - (354) (1)	11.47	1.36	0.16	Pipe - (394)	0.00	0.00	0.00	Pipe - (433)	0.00	0.00	0.00
Pipe - (355)	0.00	0.00	0.00	Pipe - (394) (1)	10.94	1.57	0.10	Pipe - (433) (1)	0.00	0.00	0.00
Pipe - (355) (1)	10.03	1.78	0.12	Pipe - (395)	0.00	0.00	0.00	Pipe - (434)	0.00	0.00	0.00
Pipe - (356)	0.00	0.00	0.00	Pipe - (395) (1)	10.18	1.24	0.11	Pipe - (434) (1)	0.00	0.00	0.00
Pipe - (356) (1)	18.78	1.08	0.18	Pipe - (396)	0.00	0.00	0.00	Pipe - (435)	0.00	0.00	0.00
Pipe - (357)	0.00	0.00	0.00	Pipe - (396) (1)	11.75	1.58	0.10	Pipe - (435) (1)	0.00	0.00	0.00
Pipe - (357) (1)	0.00	0.00	0.00	Pipe - (397)	0.00	0.00	0.00	Pipe - (436)	0.00	0.00	0.00
Pipe - (358)	0.00	0.00	0.00	Pipe - (397) (1)	0.00	0.00	0.00	Pipe - (436) (1)	0.00	0.00	0.00
Pipe - (358) (1)	0.00	0.00	0.00	Pipe - (398)	14.56	1.37	0.13	Pipe - (437)	0.00	0.00	0.00
Pipe - (359) (1)	0.00	0.00	0.00	Pipe - (398) (1)	0.00	0.00	0.00	Pipe - (437) (1)	0.00	0.00	0.00
Pipe - (36)	0.00	0.00	0.00	Pipe - (399)	13.20	1.14	0.13	Pipe - (438)	0.00	0.00	0.00
Pipe - (360)	35.72	1.06	0.09	Pipe - (399) (1)	0.00	0.00	0.00	Pipe - (438) (1)	0.00	0.00	0.00
Pipe - (360) (1)	0.00	0.00	0.00	Pipe - (4)	0.00	0.00	0.00	Pipe - (439)	0.00	0.00	0.00
Pipe - (361)	35.71	1.06	0.09	Pipe - (40)	0.00	0.00	0.00	Pipe - (439) (1)	0.00	0.00	0.00
Pipe - (361) (1)	0.00	0.00	0.00	Pipe - (400)	12.61	1.11	0.13	Pipe - (44)	0.00	0.00	0.00
Pipe - (362)	35.70	1.06	0.09	Pipe - (400) (1)	0.00	0.00	0.00	Pipe - (44) (1)	12.53	1.14	0.13
Pipe - (362) (1)	0.00	0.00	0.00	Pipe - (401)	12.48	1.02	0.13	Pipe - (440)	0.00	0.00	0.00
Pipe - (363)	59.31	1.28	0.11	Pipe - (401) (1)	0.00	0.00	0.00	Pipe - (440) (1)	0.00	0.00	0.00
Pipe - (363) (1)	0.00	0.00	0.00	Pipe - (402)	12.33	1.10	0.13	Pipe - (441)	0.00	0.00	0.00
Pipe - (364)	59.15	1.23	0.11	Pipe - (402) (1)	11.84	1.61	0.10	Pipe - (441) (1)	0.00	0.00	0.00
Pipe - (364) (1)	0.00	0.00	0.00	Pipe - (403)	12.23	1.07	0.13	Pipe - (442)	0.00	0.00	0.00
Pipe - (365)	59.05	1.24	0.11	Pipe - (403) (1)	10.23	1.03	0.12	Pipe - (442) (1)	0.00	0.00	0.00
Pipe - (365) (1)	0.00	0.00	0.00	Pipe - (404)	12.15	1.04	0.13	Pipe - (443)	0.00	0.00	0.00
Pipe - (366)	59.05	1.28	0.11	Pipe - (404) (1)	9.56	1.00	0.12	Pipe - (443) (1)	81.75	1.44	0.22
Pipe - (366) (1)	0.00	0.00	0.00	Pipe - (405)	10.48	1.45	0.15	Pipe - (444)	0.00	0.00	0.00
Pipe - (367)	83.41	1.39	0.13	Pipe - (406)	12.11	1.00	0.13	Pipe - (444) (1)	81.60	1.44	0.22
Pipe - (367) (1)	0.00	0.00	0.00	Pipe - (406) (1)	0.00	0.00	0.00	Pipe - (445)	0.00	0.00	0.00
Pipe - (368)	83.28	1.38	0.13	Pipe - (407)	0.00	0.00	0.00	Pipe - (445) (1)	81.31	1.44	0.22
Pipe - (368) (1)	0.00	0.00	0.00	Pipe - (408)	0.00	0.00	0.00	Pipe - (446)	0.00	0.00	0.00

## Pipe Results

Element ID	Peak Flow	Peak Flow Velocity	Peak Flow Depth/ Total Depth Ratio	Element ID	Peak Flow	Peak Flow Velocity	Peak Flow Depth/ Total Depth Ratio	Element ID	Peak Flow	Peak Flow Velocity	Peak Flow Depth/ Total Depth Ratio
	(gpm)	(ft/sec)			(gpm)	(ft/sec)			(gpm)	(ft/sec)	
Pipe - (446) (1)	81.22	1.44	0.22	Pipe - (485)	29.56	1.50	0.20	Pipe - (541)	0.00	0.00	0.00
Pipe - (447)	0.00	0.00	0.00	Pipe - (485) (1)	3.20	1.72	0.05	Pipe - (542)	0.00	0.00	0.00
Pipe - (447) (1)	81.16	1.44	0.22	Pipe - (486)	0.00	0.00	0.00	Pipe - (543)	14.92	1.18	0.14
Pipe - (448)	0.00	0.00	0.00	Pipe - (486) (1)	3.20	1.62	0.06	Pipe - (544)	13.24	0.99	0.15
Pipe - (448) (1)	81.17	1.44	0.22	Pipe - (487)	28.78	1.40	0.12	Pipe - (545)	12.66	0.96	0.15
Pipe - (449)	0.00	0.00	0.00	Pipe - (487) (1)	30.45	1.94	0.23	Pipe - (546)	25.99	1.26	0.20
Pipe - (449) (1)	81.12	1.44	0.22	Pipe - (488)	24.78	1.10	0.12	Pipe - (547)	0.00	0.00	0.00
Pipe - (45)	0.00	0.00	0.00	Pipe - (488) (1)	27.27	2.03	0.14	Pipe - (548)	0.00	0.00	0.00
Pipe - (45) (1)	12.49	1.05	0.13	Pipe - (489)	23.53	1.01	0.12	Pipe - (549)	0.00	0.00	0.00
Pipe - (450)	0.00	0.00	0.00	Pipe - (489) (1)	30.44	1.18	0.22	Pipe - (55)	0.00	0.00	0.00
Pipe - (450) (1)	11.91	1.08	0.08	Pipe - (49)	0.00	0.00	0.00	Pipe - (55) (1)	0.00	0.00	0.00
Pipe - (451)	0.00	0.00	0.00	Pipe - (49) (1)	23.79	1.20	0.19	Pipe - (550)	0.00	0.00	0.00
Pipe - (451) (1)	91.07	1.49	0.23	Pipe - (490)	23.49	1.02	0.12	Pipe - (551)	1.28	0.77	0.04
Pipe - (452)	0.00	0.00	0.00	Pipe - (490) (1)	44.44	1.36	0.27	Pipe - (552)	0.00	0.00	0.00
Pipe - (452) (1)	90.66	1.48	0.23	Pipe - (491)	23.62	1.02	0.12	Pipe - (553)	0.00	0.00	0.00
Pipe - (453)	0.00	0.00	0.00	Pipe - (491) (1)	43.10	1.31	0.27	Pipe - (554)	14.70	1.42	0.13
Pipe - (453) (1)	99.71	1.49	0.18	Pipe - (492)	23.28	1.02	0.12	Pipe - (555)	12.77	1.07	0.14
Pipe - (454)	0.00	0.00	0.00	Pipe - (492) (1)	43.31	2.53	0.17	Pipe - (556)	12.34	1.04	0.13
Pipe - (454) (1)	99.54	1.49	0.18	Pipe - (493)	441.87	3.94	0.22	Pipe - (556) (1)	12.05	1.01	0.13
Pipe - (455)	0.00	0.00	0.00	Pipe - (493) (1)	56.17	1.45	0.30	Pipe - (557)	11.98	1.04	0.13
Pipe - (455) (1)	99.51	1.49	0.18	Pipe - (494)	420.79	2.42	0.29	Pipe - (558)	11.97	1.10	0.13
Pipe - (456)	0.00	0.00	0.00	Pipe - (494) (1)	54.76	1.36	0.31	Pipe - (559)	12.14	1.10	0.13
Pipe - (456) (1)	99.98	2.11	0.14	Pipe - (495)	409.37	2.39	0.28	Pipe - (56)	0.00	0.00	0.00
Pipe - (457)	0.00	0.00	0.00	Pipe - (495) (1)	10.07	1.25	0.11	Pipe - (56) (1)	0.00	0.00	0.00
Pipe - (457) (1)	99.54	1.52	0.24	Pipe - (496)	416.88	2.29	0.29	Pipe - (560)	0.00	0.00	0.00
Pipe - (458)	0.00	0.00	0.00	Pipe - (496) (1)	10.16	1.18	0.11	Pipe - (561)	0.00	0.00	0.00
Pipe - (458) (1)	99.31	1.52	0.24	Pipe - (497)	412.23	2.22	0.29	Pipe - (562)	0.00	0.00	0.00
Pipe - (459)	0.00	0.00	0.00	Pipe - (497) (1)	9.89	1.00	0.12	Pipe - (563)	11.35	1.52	0.10
Pipe - (459) (1)	99.21	1.51	0.24	Pipe - (498)	453.75	2.31	0.30	Pipe - (564)	10.43	1.12	0.11
Pipe - (46)	0.00	0.00	0.00	Pipe - (498) (1)	9.45	1.00	0.11	Pipe - (565)	10.26	1.15	0.11
Pipe - (46) (1)	12.45	1.07	0.13	Pipe - (499)	472.59	4.76	0.18	Pipe - (57)	12.20	1.17	0.07
Pipe - (460)	0.00	0.00	0.00	Pipe - (499) (1)	9.26	0.95	0.12	Pipe - (57) (1)	14.02	1.38	0.13
Pipe - (460) (1)	99.17	1.51	0.24	Pipe - (5)	0.00	0.00	0.00	Pipe - (579)	12.24	1.09	0.13
Pipe - (461)	0.00	0.00	0.00	Pipe - (50)	0.00	0.00	0.00	Pipe - (58)	12.63	1.40	0.06
Pipe - (461) (1)	99.12	1.51	0.24	Pipe - (50) (1)	24.76	1.51	0.16	Pipe - (58) (1)	13.14	1.17	0.13
Pipe - (462)	0.00	0.00	0.00	Pipe - (500)	475.18	2.31	0.31	Pipe - (580)	164.00	2.15	0.49
Pipe - (462) (1)	99.17	1.72	0.22	Pipe - (500) (1)	9.17	0.92	0.12	Pipe - (582)	36.92	1.45	0.22
Pipe - (463)	0.00	0.00	0.00	Pipe - (501)	9.18	0.91	0.12	Pipe - (583)	495.28	2.83	0.36
Pipe - (463) (1)	99.16	1.76	0.22	Pipe - (502)	18.38	1.33	0.14	Pipe - (586)	0.00	0.00	0.00
Pipe - (464)	0.00	0.00	0.00	Pipe - (503)	18.38	1.05	0.17	Pipe - (588)	0.00	0.00	0.00
Pipe - (464) (1)	99.15	2.00	0.20	Pipe - (504)	18.16	1.17	0.16	Pipe - (589)	0.00	0.00	0.00
Pipe - (465)	261.38	2.36	0.13	Pipe - (505)	18.17	1.15	0.16	Pipe - (59)	12.29	1.03	0.09
Pipe - (466)	260.45	2.04	0.15	Pipe - (506)	0.00	0.00	0.00	Pipe - (59) (1)	12.40	1.07	0.13
Pipe - (467)	259.06	1.86	0.16	Pipe - (507)	11.12	1.71	0.09	Pipe - (591)	18.71	1.12	0.16
Pipe - (467) (1)	11.52	1.12	0.13	Pipe - (508)	10.16	1.38	0.10	Pipe - (593)	0.00	0.00	0.00
Pipe - (468)	258.64	1.85	0.16	Pipe - (509)	9.96	1.27	0.10	Pipe - (594)	0.00	0.00	0.00
Pipe - (468) (1)	10.04	1.36	0.10	Pipe - (51)	0.00	0.00	0.00	Pipe - (6)	0.00	0.00	0.00
Pipe - (469)	258.53	1.85	0.16	Pipe - (510)	9.45	0.99	0.12	Pipe - (60)	13.72	1.02	0.09
Pipe - (469) (1)	19.40	1.24	0.16	Pipe - (511)	9.29	0.92	0.12	Pipe - (60) (1)	12.44	1.06	0.13
Pipe - (47)	0.00	0.00	0.00	Pipe - (512)	0.00	0.00	0.00	Pipe - (61)	12.93	0.92	0.09
Pipe - (47) (1)	24.12	1.08	0.20	Pipe - (513)	0.00	0.00	0.00	Pipe - (61) (1)	12.22	1.05	0.13
Pipe - (470)	258.40	1.85	0.16	Pipe - (514)	0.00	0.00	0.00	Pipe - (62)	12.52	0.88	0.09
Pipe - (470) (1)	18.89	1.19	0.16	Pipe - (515)	0.00	0.00	0.00	Pipe - (62) (1)	12.04	1.07	0.13
Pipe - (471)	258.31	1.86	0.16	Pipe - (516)	11.47	1.28	0.12	Pipe - (63)	12.36	0.85	0.09
Pipe - (471) (1)	18.50	1.17	0.16	Pipe - (517)	28.39	1.28	0.20	Pipe - (63) (1)	11.91	1.18	0.12
Pipe - (472)	258.23	1.85	0.16	Pipe - (518)	38.25	1.38	0.23	Pipe - (64)	35.83	1.20	0.15
Pipe - (472) (1)	18.46	1.15	0.16	Pipe - (519)	37.99	1.60	0.21	Pipe - (64) (1)	12.39	0.91	0.14
Pipe - (473)	258.13	1.85	0.16	Pipe - (52)	0.00	0.00	0.00	Pipe - (65)	35.77	1.14	0.15
Pipe - (473) (1)	9.00	1.30	0.10	Pipe - (520)	37.40	1.61	0.21	Pipe - (65) (1)	11.99	1.02	0.13
Pipe - (474)	258.04	1.85	0.16	Pipe - (521)	37.13	1.60	0.21	Pipe - (66)	36.04	1.18	0.15
Pipe - (474) (1)	11.53	1.26	0.12	Pipe - (522)	36.94	1.34	0.24	Pipe - (66) (1)	11.89	1.19	0.12
Pipe - (475)	257.98	1.85	0.16	Pipe - (523)	15.59	1.29	0.21	Pipe - (67)	36.35	1.18	0.15
Pipe - (475) (1)	9.87	1.02	0.12	Pipe - (524)	13.47	0.99	0.22	Pipe - (67) (1)	0.00	0.00	0.00
Pipe - (476)	257.93	1.85	0.16	Pipe - (525)	13.43	0.92	0.22	Pipe - (68)	36.23	1.18	0.15
Pipe - (476) (1)	9.52	1.00	0.11	Pipe - (526)	0.00	0.00	0.00	Pipe - (68) (1)	0.00	0.00	0.00
Pipe - (477)	257.93	1.98	0.52	Pipe - (527)	0.00	0.00	0.00	Pipe - (69)	36.37	1.18	0.15
Pipe - (477) (1)	9.27	0.92	0.12	Pipe - (528)	0.00	0.00	0.00	Pipe - (69) (1)	14.26	1.37	0.13
Pipe - (478)	69.82	1.42	0.15	Pipe - (529)	0.00	0.00	0.00	Pipe - (70)	36.04	1.18	0.15
Pipe - (478) (1)	9.25	0.81	0.13	Pipe - (53)	0.00	0.00	0.00	Pipe - (70) (1)	13.25	1.16	0.13
Pipe - (479)	73.16	1.48	0.15	Pipe - (530)	0.00	0.00	0.00	Pipe - (71)	36.25	1.18	0.15
Pipe - (479) (1)	9.21	1.05	0.11	Pipe - (531)	0.00	0.00	0.00	Pipe - (71) (1)	12.56	1.09	0.13
Pipe - (48)	0.00	0.00	0.00	Pipe - (532)	0.00	0.00	0.00	Pipe - (72)	36.21	1.19	0.15
Pipe - (48) (1)	23.93	1.46	0.16	Pipe - (533)	0.00	0.00	0.00	Pipe - (72) (1)	12.74	1.08	0.13
Pipe - (481)	47.57	1.61	0.10	Pipe - (534)	0.00	0.00	0.00	Pipe - (73)	36.16	1.14	0.15
Pipe - (481) (1)	0.00	0.00	0.00	Pipe - (535)	0.00	0.00	0.00	Pipe - (73) (1)	12.51	1.03	0.13
Pipe - (482)	47.22	1.31	0.12	Pipe - (536)	0.00	0.00	0.00	Pipe - (74)	36.02	1.15	0.15
Pipe - (482) (1)	0.00	0.00	0.00	Pipe - (537)	0.00	0.00	0.00	Pipe - (74) (1)	12.20	1.07	0.13
Pipe - (483)	51.82	1.43	0.12	Pipe - (538)	0.00	0.00	0.00	Pipe - (75)	12.12	1.09	0.13
Pipe - (483) (1)	0.00	0.00	0.00	Pipe - (539)	0.00	0.00	0.00	Pipe - (76)	12.20	1.06	0.13
Pipe - (484)	25.21	1.20	0.15	Pipe - (54)	0.00	0.00	0.00	Pipe - (77)	12.28	1.06	0.13
Pipe - (484) (1)	3.20	0.82	0.09	Pipe - (540)	0.00	0.00	0.00	Pipe - (79)	12.08	1.53	0.11

## Pipe Results

Element ID	Peak Flow	Peak Flow Velocity	Peak Flow Depth/ Total Depth Ratio
	(gpm)	(ft/sec)	
Pipe - (80)	12.91	1.44	0.11
Pipe - (80) (1)	12.63	0.98	0.15
Pipe - (81)	12.74	1.13	0.13
Pipe - (82)	12.54	1.06	0.13
Pipe - (83)	36.00	1.13	0.15
Pipe - (83) (1)	12.38	1.10	0.13
Pipe - (84)	35.95	1.14	0.15
Pipe - (84) (1)	12.31	1.06	0.13
Pipe - (85)	35.94	1.13	0.15
Pipe - (85) (1)	12.36	1.03	0.13
Pipe - (86)	15.66	2.04	0.10
Pipe - (86) (1)	12.18	1.01	0.13
Pipe - (87)	13.55	1.64	0.11
Pipe - (87) (1)	12.13	1.03	0.13
Pipe - (88)	12.77	1.34	0.12
Pipe - (88) (1)	12.19	1.06	0.13
Pipe - (89)	12.27	1.24	0.12
Pipe - (89) (1)	0.00	0.00	0.00
Pipe - (90)	15.80	1.86	0.11
Pipe - (90) (1)	0.00	0.00	0.00
Pipe - (91)	13.23	1.73	0.10
Pipe - (91) (1)	0.00	0.00	0.00
Pipe - (92)	0.00	0.00	0.00
Pipe - (93)	24.01	1.53	0.16
Pipe - (93) (1)	0.00	0.00	0.00
Pipe - (94)	23.92	1.46	0.16
Pipe - (94) (1)	0.00	0.00	0.00
Pipe - (95)	23.88	1.45	0.16
Pipe - (95) (1)	0.00	0.00	0.00
Pipe - (96)	14.73	2.11	0.10
Pipe - (96) (1)	0.00	0.00	0.00
Pipe - (97)	13.62	1.23	0.12
Pipe - (97) (1)	0.00	0.00	0.00
Pipe - (98)	13.09	2.45	0.08
Pipe - (98) (1)	0.00	0.00	0.00
Pipe - (99)	36.37	1.68	0.20
Pipe - (99) (1)	0.00	0.00	0.00

Element ID	Peak Flow	Peak Flow Velocity	Peak Flow Depth/ Total Depth Ratio
	(gpm)	(ft/sec)	

Element ID	Peak Flow	Peak Flow Velocity	Peak Flow Depth/ Total Depth Ratio
	(gpm)	(ft/sec)	

Project Description

File Name ..... 180377\_SS\_Scenario4 18IND.SPF  
Future + MD33

Project Options

Flow Units ..... GPM  
Elevation Type ..... Elevation  
Hydrology Method ..... Rational  
Time of Concentration (TOC) Method ..... User-Defined  
Link Routing Method ..... Kinematic Wave  
Enable Overflow Ponding at Nodes ..... YES  
Skip Steady State Analysis Time Periods ..... NO

Analysis Options

Start Analysis On ..... Nov 27, 2018 00:00:00  
End Analysis On ..... Nov 28, 2018 00:00:00  
Start Reporting On ..... Nov 27, 2018 00:00:00  
Antecedent Dry Days ..... 0 days  
Runoff (Dry Weather) Time Step ..... 0 01:00:00 days hh:mm:ss  
Runoff (Wet Weather) Time Step ..... 0 00:05:00 days hh:mm:ss  
Reporting Time Step ..... 0 00:05:00 days hh:mm:ss  
Routing Time Step ..... 30 seconds

Number of Elements

Qty  
Rain Gages ..... 0  
Subbasins..... 0  
Nodes..... 1020  
    *Junctions* ..... 1017  
    *Outfalls* ..... 3  
    *Flow Diversions* ..... 0  
    *Inlets* ..... 0  
    *Storage Nodes* ..... 0  
Links..... 1014  
    *Channels* ..... 0  
    *Pipes* ..... 1010  
    *Pumps* ..... 4  
    *Orifices* ..... 0  
    *Weirs* ..... 0  
    *Outlets* ..... 0  
Pollutants ..... 0  
Land Uses ..... 0

Rainfall Details

Return Period..... 2 year(s)

## Junction Results

Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained	Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained	Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained
(gpm)	(gpm)	(ft)		(gpm)	(gpm)	(ft)		(gpm)	(gpm)	(ft)	
Jun-01	108.18	0.00	237.22	Structure - (117)	0.00	0.00	245.78	Structure - (165) (1)	52.39	0.00	223.49
Jun-02	108.43	0.00	237.71	Structure - (117) (1)	103.67	0.00	233.47	Structure - (166)	53.57	0.00	235.45
Jun-03	106.94	0.00	242.00	Structure - (118)	0.00	0.00	242.91	Structure - (166) (1)	52.09	0.00	222.49
Jun-04	106.65	0.00	243.51	Structure - (118) (1)	101.54	0.00	232.39	Structure - (167)	0.00	0.00	245.26
Jun-05	104.97	0.00	244.82	Structure - (119)	0.00	0.00	241.97	Structure - (167) (1)	52.07	0.00	221.45
Jun-06	0.00	0.00	246.62	Structure - (119) (1)	100.03	0.00	231.36	Structure - (168)	0.00	0.00	244.24
Jun-07	0.00	0.00	248.62	Structure - (120)	0.00	0.00	241.03	Structure - (168) (1)	591.23	0.00	220.28
Jun-08	0.00	0.00	248.20	Structure - (120) (1)	136.60	42.40	230.33	Structure - (169)	0.00	0.00	244.05
Jun-09	0.00	0.00	248.81	Structure - (121)	0.00	0.00	247.88	Structure - (169) (1)	0.00	0.00	222.17
Jun-10	0.00	0.00	248.97	Structure - (121) (1)	144.75	0.00	229.22	Structure - (170)	0.00	0.00	241.49
Jun-11	0.00	0.00	249.53	Structure - (122)	0.00	0.00	244.04	Structure - (170) (1)	94.20	51.80	232.44
Jun-12	0.00	0.00	248.11	Structure - (122) (1)	140.87	0.00	228.15	Structure - (171)	311.18	0.00	234.70
Jun-13	104.99	0.00	246.99	Structure - (123)	311.26	0.00	237.52	Structure - (171) (1)	102.95	0.00	231.86
Jun-14	106.82	0.00	247.14	Structure - (123) (1)	138.93	0.00	227.05	Structure - (172)	0.00	0.00	245.44
Jun-15	0.00	0.00	247.86	Structure - (124)	0.00	0.00	244.62	Structure - (172) (1)	99.48	0.00	231.06
Jun-16	0.00	0.00	249.96	Structure - (124) (1)	179.00	42.40	225.96	Structure - (173)	0.00	0.00	243.91
Jun-17	0.00	0.00	248.53	Structure - (125)	311.77	0.00	237.20	Structure - (173) (1)	97.61	0.00	230.50
Jun-18	0.00	0.00	248.91	Structure - (125) (1)	186.62	0.00	224.96	Structure - (174)	0.00	0.00	244.68
Jun-19	0.00	0.00	249.23	Structure - (126)	0.00	0.00	245.79	Structure - (174) (1)	97.00	0.00	229.46
Jun-20	0.00	0.00	249.73	Structure - (126) (1)	183.01	0.00	223.90	Structure - (175)	0.00	0.00	242.01
Jun-21	0.00	0.00	249.19	Structure - (127)	0.00	0.00	242.01	Structure - (175) (1)	96.53	0.00	228.38
Jun-22	0.00	0.00	249.63	Structure - (127) (1)	541.78	0.00	222.83	Structure - (176)	0.00	0.00	240.15
Jun-23	0.00	0.00	250.12	Structure - (128)	311.64	0.00	236.87	Structure - (176) (1)	96.00	0.00	227.28
Jun-24	0.00	0.00	250.43	Structure - (128) (1)	52.69	0.00	223.22	Structure - (177)	0.00	0.00	237.60
Jun-25	0.00	0.00	250.16	Structure - (129)	0.00	0.00	245.55	Structure - (177) (1)	95.80	0.00	226.17
Jun-26	0.00	0.00	250.81	Structure - (129) (1)	42.40	42.40	234.83	Structure - (178)	51.80	51.80	244.81
Jun-27	0.00	0.00	252.37	Structure - (130)	0.00	0.00	240.86	Structure - (178) (1)	95.22	0.00	225.00
Jun-28	0.00	0.00	251.74	Structure - (130) (1)	0.00	0.00	234.58	Structure - (179)	59.22	0.00	242.41
Jun-29	0.00	0.00	249.10	Structure - (131)	0.00	0.00	241.65	Structure - (179) (1)	94.86	0.00	224.07
Jun-30	51.80	51.80	248.60	Structure - (131) (1)	0.00	0.00	233.50	Structure - (180)	0.00	0.00	249.73
Jun-31	0.00	0.00	249.23	Structure - (132)	0.00	0.00	239.55	Structure - (180) (1)	55.01	0.00	241.93
Jun-32	57.33	0.00	247.81	Structure - (132) (1)	0.00	0.00	233.30	Structure - (181)	94.75	0.00	222.96
Jun-33	54.04	0.00	247.47	Structure - (133)	311.30	0.00	236.33	Structure - (181) (1)	54.51	0.00	236.33
Jun-34	0.00	0.00	248.80	Structure - (133) (1)	0.00	0.00	231.43	Structure - (182)	94.69	0.00	221.96
Jun-35	57.93	0.00	247.91	Structure - (134)	311.43	0.00	234.91	Structure - (182) (1)	0.00	0.00	241.50
Jun-36	54.97	0.00	248.85	Structure - (134) (1)	0.00	0.00	230.34	Structure - (183)	52.98	0.00	237.37
Jun-37	51.80	51.80	248.93	Structure - (135)	312.11	0.00	236.73	Structure - (183) (1)	59.30	0.00	229.44
Jun-41	58.54	0.00	248.16	Structure - (135) (1)	0.00	0.00	229.30	Structure - (184)	0.00	0.00	242.89
Jun-60	1779.20	1779.20	260.18	Structure - (136) (1)	0.00	0.00	228.10	Structure - (184) (1)	57.78	0.00	228.41
LS #1	1320.60	0.00	216.81	Structure - (137)	0.00	0.00	242.33	Structure - (185)	0.00	0.00	241.15
LS #2	1050.50	0.00	212.05	Structure - (137) (1)	0.00	0.00	226.99	Structure - (185) (1)	55.86	0.00	227.30
Out-1Pipe - (592)	0.00	0.00	226.59	Structure - (138)	311.47	0.00	236.10	Structure - (186)	53.70	0.00	235.68
SSCO-2	0.00	0.00	225.94	Structure - (138) (1)	0.00	0.00	225.91	Structure - (186) (1)	54.53	0.00	226.17
SSCO-3	0.00	0.00	235.86	Structure - (139) (1)	0.00	0.00	224.76	Structure - (187)	415.21	0.00	234.21
SSLS-3	109.01	0.00	231.78	Structure - (140) (1)	0.00	0.00	223.84	Structure - (187) (1)	53.73	0.00	225.10
SSLS-5	0.00	0.00	223.54	Structure - (141) (1)	0.00	0.00	222.83	Structure - (188)	415.10	0.00	233.91
SSMH - 1	0.00	0.00	248.16	Structure - (142) (1)	539.63	0.00	221.53	Structure - (188) (1)	53.07	0.00	224.07
Structure - (1)A	0.00	0.00	250.01	Structure - (146) (1)	0.00	0.00	232.55	Structure - (189)	415.16	0.00	233.58
Structure - (1)B	0.00	0.00	248.38	Structure - (147) (1)	0.00	0.00	232.28	Structure - (189) (1)	52.53	0.00	222.98
Structure - (100)	51.80	51.80	248.34	Structure - (148)	0.00	0.00	240.14	Structure - (19)	0.00	0.00	249.02
Structure - (101)	62.54	0.00	246.15	Structure - (148) (1)	0.00	0.00	230.42	Structure - (190)	415.25	0.00	233.25
Structure - (101) (1)	0.00	0.00	236.65	Structure - (149) (1)	0.00	0.00	229.36	Structure - (190) (1)	105.93	0.00	221.96
Structure - (102)	109.96	0.00	242.12	Structure - (150)	0.00	0.00	238.57	Structure - (191)	415.31	0.00	232.82
Structure - (102) (1)	53.87	0.00	234.62	Structure - (150) (1)	0.00	0.00	228.33	Structure - (191) (1)	199.52	0.00	221.44
Structure - (103)	106.25	0.00	239.90	Structure - (151)	311.72	0.00	234.96	Structure - (192)	522.91	0.00	233.89
Structure - (103) (1)	0.00	0.00	235.15	Structure - (151) (1)	0.00	0.00	227.17	Structure - (193)	521.30	0.00	232.40
Structure - (104)	51.80	51.80	249.75	Structure - (152) (1)	0.00	0.00	226.16	Structure - (193) (1)	67.16	0.00	228.24
Structure - (104) (1)	0.00	0.00	233.98	Structure - (153) (1)	0.00	0.00	224.57	Structure - (194)	520.26	0.00	231.80
Structure - (105)	61.75	0.00	245.96	Structure - (154)	51.80	51.80	245.43	Structure - (194) (1)	58.64	0.00	227.32
Structure - (105) (1)	0.00	0.00	232.95	Structure - (154) (1)	0.00	0.00	224.11	Structure - (195)	933.63	0.00	231.00
Structure - (106)	58.25	0.00	245.62	Structure - (155)	66.29	0.00	244.85	Structure - (195) (1)	56.54	0.00	226.25
Structure - (106) (1)	0.00	0.00	231.90	Structure - (155) (1)	0.00	0.00	223.05	Structure - (196)	415.05	0.00	234.55
Structure - (107)	158.95	0.00	241.15	Structure - (156)	59.55	0.00	243.95	Structure - (196) (1)	55.53	0.00	225.16
Structure - (107) (1)	0.00	0.00	230.74	Structure - (156) (1)	0.00	0.00	221.98	Structure - (197)	522.56	0.00	232.74
Structure - (108)	0.00	0.00	247.05	Structure - (157)	55.92	0.00	240.33	Structure - (197) (1)	54.87	0.00	224.13
Structure - (108) (1)	0.00	0.00	229.67	Structure - (157) (1)	539.20	0.00	220.83	Structure - (198)	519.88	0.00	231.48
Structure - (109)	159.42	0.00	239.61	Structure - (158)	54.38	0.00	236.33	Structure - (198) (1)	54.40	0.00	223.02
Structure - (109) (1)	0.00	0.00	228.57	Structure - (158) (1)	61.76	0.00	231.95	Structure - (199)	0.00	0.00	244.15
Structure - (110)	0.00	0.00	227.53	Structure - (159)	53.41	0.00	235.05	Structure - (199) (1)	0.00	0.00	228.45
Structure - (111)	106.61	0.00	240.39	Structure - (159) (1)	57.79	0.00	230.04	Structure - (200)	0.00	0.00	240.58
Structure - (111) (1)	0.00	0.00	226.49	Structure - (160)	415.35	0.00	234.59	Structure - (200) (1)	0.00	0.00	229.22
Structure - (112)	158.10	0.00	237.31	Structure - (160) (1)	55.85	0.00	228.92	Structure - (201)	0.00	0.00	238.70
Structure - (112) (1)	0.00	0.00	225.43	Structure - (161)	0.00	0.00	245.41	Structure - (201) (1)	0.00	0.00	230.52
Structure - (113)	0.00	0.00	243.36	Structure - (161) (1)	54.86	0.00	227.74	Structure - (202)	0.00	0.00	239.23
Structure - (113) (1)	0.00	0.00	224.38	Structure - (162)	0.00	0.00	245.98	Structure - (203)	0.00	0.00	240.87
Structure - (114)	311.80	0.00	238.20	Structure - (162) (1)	53.92	0.00	226.79	Structure - (204)	0.00	0.00	243.04
Structure - (114) (1)	314.15	0.00	222.15	Structure - (163)	57.85	0.00	240.88	Structure - (204) (1)	948.20	163.20	218.50
Structure - (115)	311.61	0.00	236.47	Structure - (163) (1)	53.12	0.00	225.66	Structure - (205)	0.00	0.00	243.94
Structure - (115) (1)	0.00	0.00	223.76	Structure - (164)	56.71	0.00	240.60	Structure - (205) (1)	589.81	0.00	218.82
Structure - (116)	311.52	0.00	237.85	Structure - (164) (1)	52.64	0.00	224.52	Structure - (206)	0.00	0.00	240.69
Structure - (116) (1)	94.20	51.80	234.63	Structure - (165)	55.09	0.00	237.56	Structure - (206) (1)	0.00	0.00	221.75

## Junction Results

Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained	Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained	Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained
(gpm)	(gpm)	(ft)		(gpm)	(gpm)	(ft)		(gpm)	(gpm)	(ft)	
Structure - (207)	0.00	0.00	239.12	Structure - (258) (1)	0.00	0.00	234.53	Structure - (300)	0.00	0.00	238.94
Structure - (207) (1)	951.46	0.00	218.22	Structure - (259)	58.17	0.00	243.02	Structure - (301)	0.00	0.00	239.42
Structure - (208)	54.92	0.00	238.39	Structure - (259) (1)	0.00	0.00	231.08	Structure - (301) (1)	0.00	0.00	229.80
Structure - (208) (1)	0.00	0.00	221.87	Structure - (26)	51.80	51.80	247.33	Structure - (302)	0.00	0.00	241.00
Structure - (209)	57.30	0.00	240.00	Structure - (260)	57.64	0.00	242.00	Structure - (303)	0.00	0.00	229.44
Structure - (21)	0.00	0.00	252.38	Structure - (260) (1)	0.00	0.00	229.15	Structure - (304)	0.00	0.00	241.24
Structure - (210)	51.80	51.80	243.64	Structure - (261)	0.00	0.00	244.07	Structure - (304) (1)	0.00	0.00	229.40
Structure - (211)	51.80	51.80	243.46	Structure - (261) (1)	0.00	0.00	227.23	Structure - (305)	0.00	0.00	239.98
Structure - (212)	64.09	0.00	239.12	Structure - (262)	55.72	0.00	241.01	Structure - (305) (1)	51.80	51.80	230.67
Structure - (213)	58.22	0.00	236.83	Structure - (262) (1)	0.00	0.00	226.83	Structure - (306)	0.00	0.00	238.66
Structure - (214)	110.14	0.00	236.34	Structure - (263)	55.51	0.00	238.37	Structure - (306) (1)	0.00	0.00	225.01
Structure - (214) (1)	64.02	0.00	226.31	Structure - (263) (1)	0.00	0.00	228.09	Structure - (307)	0.00	0.00	238.38
Structure - (215)	0.00	0.00	237.95	Structure - (264)	51.80	51.80	243.23	Structure - (307) (1)	0.00	0.00	226.51
Structure - (215) (1)	57.80	0.00	225.92	Structure - (265)	0.00	0.00	244.14	Structure - (308)	0.00	0.00	238.09
Structure - (216) (1)	0.00	0.00	225.60	Structure - (265) (1)	0.00	0.00	226.28	Structure - (308) (1)A	0.00	0.00	226.51
Structure - (217)	0.00	0.00	242.22	Structure - (266)	0.00	0.00	232.01	Structure - (308) (1)B	0.00	0.00	226.51
Structure - (217) (1)	55.96	0.00	225.01	Structure - (267)	51.80	51.80	249.23	Structure - (309)	0.00	0.00	237.57
Structure - (218)	0.00	0.00	243.67	Structure - (267) (1)	0.00	0.00	225.94	Structure - (309) (1)	0.00	0.00	226.50
Structure - (218) (1)	63.91	0.00	225.42	Structure - (268)	58.11	0.00	246.88	Structure - (310)	0.00	0.00	237.94
Structure - (219)	0.00	0.00	239.12	Structure - (268) (1)	0.00	0.00	225.52	Structure - (310) (1)	0.00	0.00	226.47
Structure - (219) (1)	110.56	0.00	224.68	Structure - (269)	53.45	0.00	244.69	Structure - (311)	0.00	0.00	237.44
Structure - (220) (1)	193.02	0.00	224.95	Structure - (269) (1)	0.00	0.00	228.86	Structure - (311) (1)	0.00	0.00	226.38
Structure - (221)	0.00	0.00	239.35	Structure - (270)	54.97	0.00	243.65	Structure - (312)	0.00	0.00	237.11
Structure - (221) (1)	281.83	0.00	235.47	Structure - (270) (1)	0.00	0.00	225.22	Structure - (312) (1)	0.00	0.00	226.84
Structure - (222)	0.00	0.00	238.56	Structure - (271)	108.61	0.00	242.74	Structure - (313)	0.00	0.00	236.45
Structure - (222) (1)	63.08	0.00	224.28	Structure - (271) (1)	0.00	0.00	228.06	Structure - (313) (1)A	0.00	0.00	230.23
Structure - (223)	0.00	0.00	239.32	Structure - (272)	106.62	0.00	237.19	Structure - (313) (1)B	0.00	0.00	230.23
Structure - (223) (1)	334.43	0.00	228.96	Structure - (272) (1)	0.00	0.00	227.71	Structure - (313) (1)C	0.00	0.00	230.23
Structure - (224)	0.00	0.00	238.61	Structure - (273)	0.00	0.00	247.02	Structure - (314)	0.00	0.00	235.72
Structure - (224) (1)	52.51	0.00	223.60	Structure - (273) (1)	0.00	0.00	227.36	Structure - (314) (1)	0.00	0.00	230.06
Structure - (225)	61.02	0.00	240.28	Structure - (274)	0.00	0.00	246.50	Structure - (315)	0.00	0.00	237.66
Structure - (225) (1)	418.86	0.00	228.75	Structure - (274) (1)	0.00	0.00	227.13	Structure - (315) (1)A	0.00	0.00	229.97
Structure - (226)	55.17	0.00	239.39	Structure - (275)	51.80	51.80	250.19	Structure - (315) (1)B	0.00	0.00	229.97
Structure - (226) (1)	62.76	0.00	223.36	Structure - (275) (1)	0.00	0.00	226.54	Structure - (316)	0.00	0.00	242.14
Structure - (227) (1)	334.17	0.00	228.57	Structure - (276)	61.92	0.00	246.24	Structure - (316) (1)	57.80	0.00	229.65
Structure - (228) (1)	188.72	0.00	222.99	Structure - (276) (1)	0.00	0.00	225.99	Structure - (317)	0.00	0.00	242.14
Structure - (229) (1)	452.32	0.00	228.65	Structure - (277)	57.83	0.00	244.23	Structure - (317) (1)	57.67	0.00	228.73
Structure - (230)	0.00	0.00	240.24	Structure - (277) (1)	0.00	0.00	228.56	Structure - (318)	0.00	0.00	238.54
Structure - (230) (1)	63.04	0.00	222.41	Structure - (278)	0.00	0.00	246.00	Structure - (318) (1)	55.76	0.00	228.08
Structure - (231)	320.74	0.00	221.71	Structure - (278) (1)	0.00	0.00	227.75	Structure - (319)	0.00	0.00	238.01
Structure - (232)	0.00	0.00	221.68	Structure - (279)	0.00	0.00	242.00	Structure - (319) (1)	54.45	0.00	227.44
Structure - (233)	317.97	0.00	220.71	Structure - (279) (1)	0.00	0.00	228.30	Structure - (32)A	0.00	0.00	250.57
Structure - (234)	63.66	0.00	221.41	Structure - (280)	56.12	0.00	245.41	Structure - (32)B	0.00	0.00	250.57
Structure - (235)	372.38	0.00	220.47	Structure - (280) (1)	0.00	0.00	227.44	Structure - (320)	0.00	0.00	242.00
Structure - (236)	335.62	0.00	226.07	Structure - (281)	54.29	0.00	243.43	Structure - (320) (1)	54.15	0.00	227.20
Structure - (237)	108.04	0.00	260.01	Structure - (281) (1)	0.00	0.00	227.03	Structure - (321)	0.00	0.00	239.30
Structure - (237) (1)	370.01	0.00	219.75	Structure - (282)	53.95	0.00	243.28	Structure - (321) (1)	53.48	0.00	226.90
Structure - (238) (1)	369.41	0.00	219.60	Structure - (282) (1)	0.00	0.00	227.40	Structure - (322)	0.00	0.00	238.35
Structure - (238)A	0.00	0.00	236.96	Structure - (283)	108.71	0.00	242.29	Structure - (322) (1)	0.00	0.00	225.17
Structure - (238)B	0.00	0.00	236.96	Structure - (283) (1)	0.00	0.00	226.61	Structure - (323)	0.00	0.00	239.18
Structure - (239)	0.00	0.00	248.50	Structure - (284)	107.67	0.00	239.56	Structure - (323) (1)	0.00	0.00	223.96
Structure - (239) (1)	368.59	0.00	218.94	Structure - (284) (1)	0.00	0.00	227.47	Structure - (324)	0.00	0.00	239.27
Structure - (240)	0.00	0.00	246.00	Structure - (285)	106.92	0.00	237.77	Structure - (324) (1)	0.00	0.00	222.74
Structure - (240) (1)	368.17	0.00	218.36	Structure - (285) (1)	0.00	0.00	227.13	Structure - (325)	0.00	0.00	241.14
Structure - (241)	0.00	0.00	238.67	Structure - (286)	106.34	0.00	237.01	Structure - (325) (1)	0.00	0.00	220.59
Structure - (241) (1)	1322.85	0.00	217.51	Structure - (286) (1)	0.00	0.00	226.56	Structure - (326)	0.00	0.00	239.60
Structure - (242) (1)	52.47	0.00	225.61	Structure - (287)	0.00	0.00	236.64	Structure - (326) (1)	109.62	0.00	219.51
Structure - (243) (1)	962.49	0.00	217.32	Structure - (287) (1)	0.00	0.00	225.46	Structure - (327)	0.00	0.00	238.99
Structure - (244) (1)	59.08	0.00	235.01	Structure - (288)	0.00	0.00	235.97	Structure - (327) (1)	0.00	0.00	229.15
Structure - (245)	0.00	0.00	248.24	Structure - (289)	0.00	0.00	235.20	Structure - (328)	0.00	0.00	237.71
Structure - (245) (1)	57.94	0.00	232.83	Structure - (29)	54.31	0.00	245.70	Structure - (328) (1)	0.00	0.00	228.48
Structure - (246)	0.00	0.00	247.95	Structure - (290)	0.00	0.00	234.70	Structure - (329)	0.00	0.00	236.77
Structure - (246) (1)	55.80	0.00	232.06	Structure - (290) (1)	0.00	0.00	233.19	Structure - (329) (1)	0.00	0.00	229.35
Structure - (247)	0.00	0.00	246.94	Structure - (291)	0.00	0.00	237.40	Structure - (330)	0.00	0.00	236.33
Structure - (247) (1)	54.54	0.00	231.38	Structure - (291) (1)	0.00	0.00	232.17	Structure - (330) (1)	0.00	0.00	228.69
Structure - (248)	51.80	51.80	236.04	Structure - (292)	0.00	0.00	234.34	Structure - (331)	0.00	0.00	235.56
Structure - (250)	0.00	0.00	236.35	Structure - (292) (1)	0.00	0.00	231.01	Structure - (331) (1)	0.00	0.00	227.86
Structure - (250) (1)	51.80	0.00	235.86	Structure - (293)	0.00	0.00	233.92	Structure - (332)	0.00	0.00	235.00
Structure - (251)	158.75	0.00	236.33	Structure - (293) (1)	0.00	0.00	230.07	Structure - (333)	0.00	0.00	234.55
Structure - (252)	157.19	0.00	235.63	Structure - (294)	0.00	0.00	233.80	Structure - (333) (1)	0.00	0.00	228.11
Structure - (253)	156.50	0.00	235.02	Structure - (294) (1)B	0.00	0.00	229.80	Structure - (334)	51.80	51.80	248.44
Structure - (253) (1)	0.00	0.00	236.19	Structure - (295)	0.00	0.00	241.50	Structure - (334) (1)	52.69	0.00	226.48
Structure - (254)	156.20	0.00	234.41	Structure - (295) (1)	0.00	0.00	229.31	Structure - (335)	64.38	0.00	247.51
Structure - (254) (1)	0.00	0.00	231.61	Structure - (296)	0.00	0.00	239.39	Structure - (335) (1)	0.00	0.00	224.13
Structure - (255)	0.00	0.00	236.07	Structure - (296) (1)	0.00	0.00	229.01	Structure - (336)	56.53	0.00	246.19
Structure - (255) (1)	0.00	0.00	232.31	Structure - (297)	0.00	0.00	239.43	Structure - (336) (1)A	0.00	0.00	223.50
Structure - (256)	158.02	0.00	235.83	Structure - (297) (1)	0.00	0.00	224.15	Structure - (336) (1)B	0.00	0.00	223.50
Structure - (256) (1)	0.00	0.00	227.74	Structure - (298)	0.00	0.00	241.50	Structure - (337)	54.55	0.00	245.35
Structure - (257)	156.19	0.00	234.89	Structure - (298) (1)	0.00	0.00	223.98	Structure - (337) (1)	0.00	0.00	222.92
Structure - (257) (1)	0.00	0.00	229.25	Structure - (299)	0.00	0.00	238.69	Structure - (338)	53.37	0.00	244.32
Structure - (258)	0.00	0.00	244.81	Structure - (3)	0.00	0.00	247.14	Structure - (338) (1)	0.00	0.00	222.38



## Junction Results

Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained	Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained	Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained
	(gpm)	(gpm)	(ft)		(gpm)	(gpm)	(ft)		(gpm)	(gpm)	(ft)
Structure - (339)	105.02	0.00	243.63	Structure - (379) (1)	0.00	0.00	221.58	Structure - (419) (1)	0.00	0.00	220.96
Structure - (339) (1)	0.00	0.00	221.82	Structure - (380)	415.11	0.00	230.51	Structure - (420)	55.76	0.00	238.09
Structure - (340)	103.76	0.00	242.71	Structure - (380) (1)	0.00	0.00	222.56	Structure - (420) (1)	0.00	0.00	220.32
Structure - (340) (1)	0.00	0.00	222.15	Structure - (381)	156.14	0.00	233.84	Structure - (421)	0.00	0.00	219.54
Structure - (341)	103.81	0.00	241.50	Structure - (381) (1)	52.20	52.20	223.75	Structure - (422)	472.14	0.00	219.34
Structure - (341) (1)	52.20	52.20	221.97	Structure - (382)	156.04	0.00	233.79	Structure - (424)	0.00	0.00	248.36
Structure - (342)	259.31	0.00	233.73	Structure - (382) (1)	57.74	0.00	222.82	Structure - (424) (1)	0.00	0.00	221.16
Structure - (342) (1)	63.45	0.00	221.27	Structure - (383)	259.30	0.00	232.92	Structure - (425)	0.00	0.00	249.76
Structure - (343)	58.23	0.00	246.71	Structure - (383) (1)	58.41	0.00	221.50	Structure - (425) (1)A	0.00	0.00	220.70
Structure - (343) (1)	58.80	0.00	223.44	Structure - (384)	364.44	0.00	231.60	Structure - (425) (1)B	0.00	0.00	220.70
Structure - (344)	55.39	0.00	245.55	Structure - (384) (1)	210.24	0.00	220.63	Structure - (426)	0.00	0.00	247.12
Structure - (344) (1)	109.92	0.00	220.42	Structure - (385)	0.00	0.00	239.14	Structure - (426) (1)	0.00	0.00	220.06
Structure - (345)	54.31	0.00	245.26	Structure - (385) (1)	59.44	0.00	221.70	Structure - (427)	0.00	0.00	244.62
Structure - (345) (1)	0.00	0.00	225.10	Structure - (386)	0.00	0.00	241.51	Structure - (427) (1)	0.00	0.00	219.64
Structure - (346)	53.65	0.00	244.47	Structure - (386) (1)	52.20	52.20	222.80	Structure - (428)	0.00	0.00	252.40
Structure - (346) (1)	63.02	0.00	225.48	Structure - (387)	52.83	0.00	240.41	Structure - (428) (1)	0.00	0.00	219.19
Structure - (347)	53.04	0.00	244.23	Structure - (387) (1)	0.00	0.00	224.13	Structure - (429)	0.00	0.00	247.58
Structure - (347) (1)	52.20	52.20	226.37	Structure - (388)	58.10	0.00	239.33	Structure - (429) (1)	0.00	0.00	218.69
Structure - (348)	52.60	0.00	243.71	Structure - (389)	107.60	0.00	238.64	Structure - (430)	51.80	0.00	246.96
Structure - (349)	104.21	0.00	243.09	Structure - (389) (1)	52.20	52.20	222.45	Structure - (430) (1)	0.00	0.00	218.45
Structure - (349) (1)	0.00	0.00	221.85	Structure - (39)	0.00	0.00	248.68	Structure - (431)	51.80	0.00	246.56
Structure - (35)	0.00	0.00	250.31	Structure - (390)	110.72	0.00	234.16	Structure - (431) (1)	0.00	0.00	220.49
Structure - (350)	103.66	0.00	242.53	Structure - (390) (1)	57.54	0.00	221.43	Structure - (432)	53.68	0.00	244.83
Structure - (350) (1)	0.00	0.00	221.25	Structure - (391)	0.00	0.00	244.02	Structure - (432) (1)	0.00	0.00	220.10
Structure - (351)	103.85	0.00	241.64	Structure - (391) (1)	266.09	0.00	220.34	Structure - (433)	0.00	0.00	250.11
Structure - (351) (1)	0.00	0.00	220.32	Structure - (392)	51.80	51.80	243.16	Structure - (433) (1)	0.00	0.00	219.54
Structure - (352)	103.73	0.00	234.51	Structure - (392) (1)	52.20	52.20	221.67	Structure - (434)	0.00	0.00	250.39
Structure - (352) (1)	0.00	0.00	219.78	Structure - (393)	0.00	0.00	242.03	Structure - (434) (1)	0.00	0.00	219.34
Structure - (353)	103.72	0.00	233.88	Structure - (393) (1)	323.98	0.00	220.04	Structure - (435)	0.00	0.00	250.47
Structure - (353) (1)	0.00	0.00	219.35	Structure - (394)	51.80	51.80	241.16	Structure - (435) (1)	471.92	0.00	219.21
Structure - (354)	0.00	0.00	218.86	Structure - (394) (1)	0.00	0.00	222.63	Structure - (436)	0.00	0.00	249.70
Structure - (355)	51.80	51.80	248.40	Structure - (395)	0.00	0.00	222.01	Structure - (436) (1)	471.77	0.00	219.00
Structure - (355) (1)	0.00	0.00	218.50	Structure - (396) (1)	0.00	0.00	222.62	Structure - (437)	0.00	0.00	249.42
Structure - (356)	64.15	0.00	247.30	Structure - (396)A	0.00	0.00	243.50	Structure - (437) (1)	471.56	0.00	218.77
Structure - (356) (1)	0.00	0.00	217.76	Structure - (396)B	0.00	0.00	243.50	Structure - (438)	0.00	0.00	249.00
Structure - (357)	55.17	0.00	245.06	Structure - (397)	0.00	0.00	242.27	Structure - (438) (1)	471.36	0.00	218.54
Structure - (357) (1)	0.00	0.00	217.28	Structure - (397) (1)	0.00	0.00	222.20	Structure - (439)	0.00	0.00	248.05
Structure - (358)	53.12	0.00	244.85	Structure - (398)	0.00	0.00	241.13	Structure - (439) (1)	0.00	0.00	220.34
Structure - (358) (1)	0.00	0.00	216.98	Structure - (398) (1)	0.00	0.00	221.01	Structure - (440)	0.00	0.00	247.58
Structure - (359)	0.00	0.00	245.19	Structure - (399)	0.00	0.00	241.03	Structure - (440) (1)	471.12	0.00	218.00
Structure - (359) (1)	578.67	0.00	217.03	Structure - (399) (1)	52.20	52.20	223.36	Structure - (441)	0.00	0.00	245.93
Structure - (36)	0.00	0.00	250.11	Structure - (40)	0.00	0.00	247.10	Structure - (441) (1)	52.20	52.20	217.93
Structure - (360)	0.00	0.00	246.14	Structure - (400)	0.00	0.00	239.60	Structure - (442)	54.89	0.00	242.47
Structure - (360) (1)	0.00	0.00	222.19	Structure - (400) (1)	63.75	0.00	221.38	Structure - (442) (1)	536.97	0.00	217.85
Structure - (361)	0.00	0.00	248.12	Structure - (401)	0.00	0.00	240.34	Structure - (443)	58.30	0.00	243.09
Structure - (361) (1)	0.00	0.00	220.23	Structure - (401) (1)	58.02	0.00	220.60	Structure - (443) (1)	528.12	0.00	217.39
Structure - (362)	58.90	0.00	246.45	Structure - (402)	0.00	0.00	239.27	Structure - (444)	0.00	0.00	247.41
Structure - (362) (1)	0.00	0.00	221.98	Structure - (402) (1)	473.18	0.00	219.64	Structure - (445)	0.00	0.00	248.06
Structure - (363)	56.86	0.00	245.92	Structure - (403)	0.00	0.00	238.75	Structure - (445) (1)	582.67	0.00	216.62
Structure - (363) (1)	0.00	0.00	222.70	Structure - (403) (1)	0.00	0.00	223.87	Structure - (446)	0.00	0.00	248.81
Structure - (364)	55.84	0.00	245.27	Structure - (404)	0.00	0.00	237.87	Structure - (446) (1)	578.50	0.00	216.50
Structure - (364) (1)	52.20	52.20	219.57	Structure - (404) (1)	0.00	0.00	223.00	Structure - (447)	577.17	0.00	216.38
Structure - (365)	54.49	0.00	244.98	Structure - (405)	0.00	0.00	237.57	Structure - (448)	933.27	0.00	230.17
Structure - (366)	54.31	0.00	244.97	Structure - (405) (1)	58.55	0.00	222.49	Structure - (448) (1)	576.10	0.00	214.78
Structure - (366) (1)	0.00	0.00	222.55	Structure - (406)	0.00	0.00	236.81	Structure - (449)	936.66	0.00	229.00
Structure - (367)	53.99	0.00	244.94	Structure - (406) (1)	52.20	52.20	223.39	Structure - (449) (1)	575.23	0.00	214.62
Structure - (367) (1)	0.00	0.00	222.39	Structure - (407)	53.01	0.00	236.00	Structure - (450)	936.01	0.00	228.60
Structure - (368)	53.72	0.00	244.91	Structure - (407) (1)	0.00	0.00	222.63	Structure - (450) (1)	574.40	0.00	214.24
Structure - (368) (1)	0.00	0.00	222.29	Structure - (408)	53.21	0.00	235.41	Structure - (451)	935.85	0.00	228.24
Structure - (369)	53.65	0.00	244.90	Structure - (408) (1)	58.19	0.00	221.75	Structure - (451) (1)	574.33	0.00	214.22
Structure - (369) (1)	52.20	52.20	229.06	Structure - (409)	53.46	0.00	236.01	Structure - (452)	935.55	0.00	227.76
Structure - (370)	53.12	0.00	244.86	Structure - (409) (1)	52.20	52.20	222.18	Structure - (453)	982.68	0.00	227.27
Structure - (370) (1)	63.26	0.00	227.90	Structure - (41)	0.00	0.00	245.56	Structure - (453) (1)	574.83	0.00	214.46
Structure - (371)	52.79	0.00	244.31	Structure - (410)	53.93	0.00	236.72	Structure - (454)	0.00	0.00	231.34
Structure - (371) (1)	58.08	0.00	226.88	Structure - (410) (1)	112.37	0.00	221.32	Structure - (454) (1)	574.49	0.00	214.32
Structure - (372)	52.69	0.00	243.99	Structure - (411)	54.79	0.00	237.63	Structure - (455)	22.40	22.40	231.10
Structure - (372) (1)	55.83	0.00	225.60	Structure - (411) (1)	0.00	0.00	221.45	Structure - (455) (1)	574.39	0.00	213.07
Structure - (373)	0.00	0.00	245.27	Structure - (412) (1)	111.80	0.00	220.67	Structure - (456)	22.40	0.00	231.08
Structure - (373) (1)	55.02	0.00	223.23	Structure - (413)	57.39	0.00	239.32	Structure - (456) (1)	574.44	0.00	212.01
Structure - (374)	0.00	0.00	234.33	Structure - (413) (1)	108.39	0.00	220.25	Structure - (457)	26.53	0.00	230.91
Structure - (374) (1)	52.20	52.20	224.04	Structure - (414)	61.81	0.00	240.23	Structure - (458)	25.39	0.00	230.52
Structure - (375)	259.32	0.00	233.20	Structure - (414) (1)	106.93	0.00	220.00	Structure - (458) (1)	26.10	26.10	222.57
Structure - (375) (1)A	62.89	0.00	222.94	Structure - (415)	51.80	51.80	240.96	Structure - (459)	24.54	0.00	230.12
Structure - (375) (1)B	0.00	0.00	222.72	Structure - (415) (1)	105.81	0.00	219.62	Structure - (459) (1)A	0.00	0.00	222.37
Structure - (376)	259.38	0.00	232.60	Structure - (416)	0.00	0.00	240.11	Structure - (459) (1)B	26.10	0.00	222.51
Structure - (376) (1)	58.61	0.00	222.09	Structure - (416) (1)	0.00	0.00	222.75	Structure - (460)	24.10	0.00	229.72
Structure - (377)	366.40	0.00	232.83	Structure - (417)	0.00	0.00	241.24	Structure - (460) (1)	78.56	0.00	220.98
Structure - (377) (1)	56.66	0.00	221.41	Structure - (417) (1)	0.00	0.00	221.45	Structure - (461)	23.82	0.00	229.32
Structure - (378)	415.59	0.00	234.61	Structure - (418)	0.00	0.00	242.37	Structure - (461) (1)	87.35	0.00	219.75
Structure - (378) (1)	110.05	0.00	220.77	Structure - (418) (1)	0.00	0.00	220.18	Structure - (462)	23.62	0.00	228.93
Structure - (379)	415.22	0.00	231.02	Structure - (419)	0.00	0.00	241.63	Structure - (462) (1)	84.07	0.00	218.51

## Junction Results

Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained	Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained	Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained
	(gpm)	(gpm)	(ft)		(gpm)	(gpm)	(ft)		(gpm)	(gpm)	(ft)
Structure - (463)	23.47	0.00	228.53	Structure - (503)	0.00	0.00	238.27	Structure - (545)	0.00	0.00	227.26
Structure - (463) (1)	82.02	0.00	217.27	Structure - (503) (1)	0.00	0.00	218.14	Structure - (546)	3.20	3.20	228.03
Structure - (464)	23.35	0.00	228.13	Structure - (504)	0.00	0.00	239.46	Structure - (547)	58.89	0.00	220.62
Structure - (464) (1)	131.80	0.00	216.61	Structure - (504) (1)	52.20	52.20	218.72	Structure - (549)	0.00	0.00	234.45
Structure - (465)	23.26	0.00	227.71	Structure - (505)	981.51	0.00	226.97	Structure - (55)	0.00	0.00	249.76
Structure - (465) (1)	52.20	52.20	221.14	Structure - (506)	980.92	0.00	226.66	Structure - (55) (1)	105.04	0.00	230.81
Structure - (466)	44.80	22.40	227.37	Structure - (506) (1)	218.86	0.00	217.23	Structure - (550)	0.00	0.00	232.99
Structure - (467)	51.59	0.00	226.98	Structure - (507)	979.58	0.00	226.30	Structure - (551)	42.40	42.40	237.80
Structure - (467) (1)	52.20	52.20	221.78	Structure - (507) (1)	215.94	0.00	213.85	Structure - (552)	52.46	0.00	236.67
Structure - (468)	0.00	0.00	236.67	Structure - (508)	978.81	0.00	225.81	Structure - (553)	47.19	0.00	235.84
Structure - (468) (1)	64.35	0.00	220.88	Structure - (508) (1)	212.84	0.00	213.08	Structure - (554)	45.09	0.00	234.77
Structure - (469)	0.00	0.00	236.81	Structure - (509)	978.58	0.00	225.33	Structure - (555)	44.48	0.00	234.22
Structure - (469) (1)	58.47	0.00	219.88	Structure - (509) (1)	214.04	0.00	212.23	Structure - (556)	44.29	0.00	233.61
Structure - (470)	0.00	0.00	235.58	Structure - (51)	58.32	0.00	246.83	Structure - (557)	0.00	0.00	235.53
Structure - (470) (1)	55.73	0.00	218.88	Structure - (51) (1)	63.21	0.00	235.04	Structure - (558)	0.00	0.00	235.94
Structure - (471)	0.00	0.00	235.51	Structure - (510)	978.41	0.00	224.39	Structure - (559)	0.00	0.00	235.52
Structure - (471) (1)	54.74	0.00	217.91	Structure - (511)	978.24	0.00	224.37	Structure - (56)	0.00	0.00	250.23
Structure - (472)	0.00	0.00	235.15	Structure - (511) (1)	56.83	0.00	219.53	Structure - (56) (1)	104.92	0.00	230.14
Structure - (472) (1)	54.26	0.00	217.43	Structure - (512)	978.13	0.00	223.89	Structure - (560)	45.37	0.00	235.38
Structure - (473)	0.00	0.00	234.85	Structure - (512) (1)	54.57	0.00	218.38	Structure - (562)	51.80	51.80	226.62
Structure - (473) (1)	0.00	0.00	220.69	Structure - (513)	978.06	0.00	223.41	Structure - (563)	0.00	0.00	226.33
Structure - (474)	0.00	0.00	234.55	Structure - (513) (1)	0.00	0.00	218.31	Structure - (564)	51.80	51.80	226.03
Structure - (474) (1)	0.00	0.00	219.83	Structure - (514)	978.00	0.00	236.62	Structure - (565)	163.20	163.20	225.63
Structure - (475)	0.00	0.00	234.34	Structure - (514) (1)	0.00	0.00	217.42	Structure - (566)	51.80	51.80	225.12
Structure - (475) (1)	0.00	0.00	217.70	Structure - (515)	979.08	0.00	226.04	Structure - (567)	42.40	42.40	224.33
Structure - (476)	0.00	0.00	233.98	Structure - (515) (1)	215.90	0.00	213.66	Structure - (568)	51.80	51.80	224.41
Structure - (476) (1)	9.80	0.00	227.85	Structure - (516)	978.95	0.00	225.95	Structure - (569)	163.20	163.20	224.30
Structure - (477)	0.00	0.00	233.39	Structure - (516) (1)	213.45	0.00	213.25	Structure - (57)	0.00	0.00	250.69
Structure - (477) (1)	141.40	0.00	214.89	Structure - (517)	3557.20	0.00	236.53	Structure - (57) (1)	104.36	0.00	228.39
Structure - (478)	0.00	0.00	232.91	Structure - (518)	73.95	0.00	225.41	Structure - (570)	51.80	51.80	223.46
Structure - (478) (1)	182.70	42.40	214.33	Structure - (518) (1)	51.80	51.80	223.58	Structure - (571)	0.00	0.00	221.70
Structure - (479)	0.00	0.00	232.91	Structure - (519) (1)	66.57	0.00	222.52	Structure - (572)	51.80	51.80	222.24
Structure - (479) (1)	190.77	0.00	213.66	Structure - (519)B	67.20	22.40	225.77	Structure - (573)	0.00	0.00	225.24
Structure - (480)	0.00	0.00	232.36	Structure - (52)	57.58	0.00	247.64	Structure - (574)	0.00	0.00	224.53
Structure - (480) (1)	187.11	0.00	212.91	Structure - (52) (1)	57.68	0.00	233.87	Structure - (575)	0.00	0.00	224.03
Structure - (481)	0.00	0.00	231.91	Structure - (520) (1)	58.56	0.00	221.86	Structure - (576)	42.40	42.40	223.67
Structure - (481) (1)	225.10	42.40	212.77	Structure - (521)	46.74	0.00	230.84	Structure - (577)	0.00	0.00	225.17
Structure - (482)	0.00	0.00	231.41	Structure - (521) (1)	0.00	0.00	223.34	Structure - (578)	0.00	0.00	228.06
Structure - (482) (1)	233.54	0.00	212.16	Structure - (522)	44.80	22.40	233.25	Structure - (579)	0.00	0.00	227.19
Structure - (483)	0.00	0.00	236.31	Structure - (522) (1)	0.00	0.00	222.82	Structure - (58)	107.55	0.00	227.42
Structure - (483) (1)	841.70	42.40	211.73	Structure - (523)	29.56	0.00	233.91	Structure - (580)	0.00	0.00	240.14
Structure - (484)	0.00	0.00	235.78	Structure - (523) (1)	0.00	0.00	222.03	Structure - (581)	51.80	51.80	235.87
Structure - (484) (1)	9.80	0.00	215.85	Structure - (524)	22.40	22.40	234.50	Structure - (582)	51.80	51.80	230.26
Structure - (485)	141.47	0.00	215.17	Structure - (524) (1)	0.00	0.00	223.74	Structure - (583)	51.80	51.80	233.59
Structure - (486)	0.00	0.00	238.80	Structure - (525) (1)	0.00	0.00	222.75	Structure - (585)	0.00	0.00	230.18
Structure - (486) (1)	9.80	9.80	229.60	Structure - (526)	51.82	0.00	232.25	Structure - (586)	51.80	51.80	230.11
Structure - (487)	0.00	0.00	237.97	Structure - (526) (1)	0.00	0.00	221.97	Structure - (587)	52.20	52.20	218.78
Structure - (487) (1)	52.20	52.20	222.41	Structure - (527)	92.64	92.64	231.35	Structure - (588)	59.35	0.00	217.73
Structure - (488)	0.00	0.00	237.25	Structure - (527) (1)	0.00	0.00	222.45	Structure - (589)	55.38	0.00	217.56
Structure - (488) (1)	53.54	0.00	222.05	Structure - (528)	115.92	0.00	230.84	Structure - (59)	0.00	0.00	252.63
Structure - (489)	0.00	0.00	237.62	Structure - (528) (1)	0.00	0.00	223.16	Structure - (59) (1)	159.01	0.00	225.52
Structure - (489) (1)	58.82	0.00	221.04	Structure - (529)	103.19	0.00	230.30	Structure - (592)	0.00	0.00	226.74
Structure - (490)	0.00	0.00	238.30	Structure - (529) (1)	0.00	0.00	221.95	Structure - (60)	0.00	0.00	251.22
Structure - (490) (1)	56.33	0.00	220.42	Structure - (53)	55.48	0.00	232.65	Structure - (606)	0.00	0.00	217.80
Structure - (491)	0.00	0.00	238.99	Structure - (530)	99.27	0.00	230.02	Structure - (609)	51.80	51.80	229.93
Structure - (491) (1)	55.19	0.00	219.69	Structure - (530) (1)	0.00	0.00	222.62	Structure - (61)	0.00	0.00	250.29
Structure - (492)	0.00	0.00	233.54	Structure - (531)	97.21	0.00	230.00	Structure - (610)	0.00	0.00	232.60
Structure - (492) (1)	54.47	0.00	218.76	Structure - (531) (1)	0.00	0.00	221.10	Structure - (611)	0.00	0.00	233.54
Structure - (493)	0.00	0.00	234.06	Structure - (533)	101.15	0.00	230.17	Structure - (612)	51.80	51.80	235.21
Structure - (493) (1)	54.33	0.00	218.66	Structure - (533) (1)	0.00	0.00	220.13	Structure - (615)	0.00	0.00	222.64
Structure - (494)	0.00	0.00	234.79	Structure - (534)	1113.70	92.64	229.99	Structure - (62)	0.00	0.00	249.83
Structure - (494) (1)	106.19	0.00	218.01	Structure - (534) (1)	0.00	0.00	227.83	Structure - (620)	0.00	0.00	217.86
Structure - (495)	0.00	0.00	235.03	Structure - (535)	359.80	359.80	233.13	Structure - (622)	0.00	0.00	224.20
Structure - (495) (1)	105.79	0.00	216.78	Structure - (535) (1)	0.00	0.00	224.40	Structure - (623)	0.00	0.00	224.99
Structure - (496)	0.00	0.00	235.45	Structure - (536)	488.19	92.64	230.47	Structure - (626)	0.00	0.00	222.26
Structure - (496) (1)	105.21	0.00	216.15	Structure - (536) (1)	0.00	0.00	223.13	Structure - (627)	109.07	0.00	219.10
Structure - (497)	0.00	0.00	235.73	Structure - (537)	835.78	383.34	230.43	Structure - (63)	0.00	0.00	247.74
Structure - (497) (1)	104.91	0.00	215.34	Structure - (537) (1)	0.00	0.00	224.05	Structure - (65)	0.00	0.00	226.29
Structure - (498)	0.00	0.00	235.89	Structure - (538)	961.07	92.64	229.89	Structure - (66)	51.80	51.80	243.40
Structure - (498) (1)	169.15	0.00	217.70	Structure - (538) (1)	0.00	0.00	223.28	Structure - (66) (1)	58.76	0.00	235.29
Structure - (499)	0.00	0.00	236.29	Structure - (539)	963.57	0.00	229.78	Structure - (67)	51.80	0.00	243.33
Structure - (499) (1)	0.00	0.00	221.78	Structure - (539) (1)	65.45	0.00	225.21	Structure - (67) (1)	57.43	0.00	234.10
Structure - (5)	0.00	0.00	245.52	Structure - (54)	0.00	0.00	249.28	Structure - (68)	55.94	0.00	242.79
Structure - (50)	51.80	51.80	249.47	Structure - (54) (1)	54.26	0.00	231.61	Structure - (68) (1)	55.74	0.00	233.06
Structure - (50) (1)	51.80	51.80	236.02	Structure - (540)	1206.34	92.64	229.76	Structure - (69)	159.23	0.00	243.16
Structure - (500)	0.00	0.00	237.34	Structure - (540) (1)	58.01	0.00	224.52	Structure - (69) (1)	54.48	0.00	231.95
Structure - (500) (1)	52.20	52.20	222.23	Structure - (541)	1206.89	0.00	223.37	Structure - (7)	53.10	0.00	244.10
Structure - (501)	0.00	0.00	237.61	Structure - (541) (1)	94.20	42.40	223.91	Structure - (70)	157.53	0.00	241.78
Structure - (501) (1)	54.70	0.00	219.15	Structure - (542)	51.80	51.80	225.95	Structure - (70) (1)	53.76	0.00	230.93
Structure - (502)	0.00	0.00	238.11	Structure - (543)	0.00	0.00	224.65	Structure - (71)	156.42	0.00	241.52
Structure - (502) (1)	0.00	0.00	219.50	Structure - (544)	0.00	0.00	227.64	Structure - (71) (1)	52.81	0.00	229.79

## Junction Results

Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained
	(gpm)	(gpm)	(ft)
Structure - (72)	156.38	0.00	240.92
Structure - (72) (1)	52.34	0.00	228.23
Structure - (73)	156.49	0.00	240.40
Structure - (73) (1)	52.10	0.00	227.70
Structure - (74)	156.66	0.00	239.86
Structure - (74) (1)	52.03	0.00	226.59
Structure - (75)	156.62	0.00	239.31
Structure - (75) (1)	210.61	0.00	224.81
Structure - (76)	156.84	0.00	238.76
Structure - (76) (1)	0.00	0.00	226.47
Structure - (77)	156.69	0.00	238.22
Structure - (78)	157.39	0.00	237.67
Structure - (78) (1)	60.08	0.00	233.41
Structure - (79)	157.14	0.00	237.49
Structure - (79) (1)	57.57	0.00	232.29
Structure - (80)	157.02	0.00	237.18
Structure - (80) (1)	55.31	0.00	231.23
Structure - (81)	54.36	0.00	230.11
Structure - (82)	53.87	0.00	229.11
Structure - (83)	53.11	0.00	228.04
Structure - (84)	52.16	0.00	226.95
Structure - (85)	52.10	0.00	225.86
Structure - (86)	262.33	0.00	224.77
Structure - (87)	51.80	0.00	234.78
Structure - (88)	55.58	0.00	233.84
Structure - (89)	55.52	0.00	232.72
Structure - (90)	54.67	0.00	231.60
Structure - (91)	54.00	0.00	230.55
Structure - (92)	0.00	0.00	250.87
Structure - (92) (1)	53.65	0.00	229.38
Structure - (93)	0.00	0.00	248.68
Structure - (93) (1)	53.12	0.00	228.34
Structure - (94)	312.42	0.00	237.05
Structure - (94) (1)	52.78	0.00	227.33
Structure - (95)	156.85	0.00	237.06
Structure - (95) (1)	52.22	0.00	226.33
Structure - (96)	156.83	0.00	236.85
Structure - (96) (1)	52.23	0.00	225.29
Structure - (97)	51.80	51.80	251.85
Structure - (97) (1)	314.18	0.00	224.16
Structure - (97.5)	63.58	0.00	248.12
Structure - (98)	57.76	0.00	245.75
Structure - (98) (1)	51.80	51.80	234.04
Structure - (99)	55.48	0.00	243.63
Structure - (294) (1)A	0.00	0.00	229.91

Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained
	(gpm)	(gpm)	(ft)

Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained
	(gpm)	(gpm)	(ft)

## Pipe Results

Element ID	Peak Flow (gpm)	Peak Flow Velocity (ft/sec)	Peak Flow Depth/ Total Depth Ratio	Element ID	Peak Flow (gpm)	Peak Flow Velocity (ft/sec)	Peak Flow Depth/ Total Depth Ratio	Element ID	Peak Flow (gpm)	Peak Flow Velocity (ft/sec)	Peak Flow Depth/ Total Depth Ratio
Link-02	108.18	1.52	0.15	Pipe - (114) (1)	138.13	2.08	0.44	Pipe - (16)	0.00	0.00	0.00
Link-03	108.43	1.80	0.13	Pipe - (115)	0.00	0.00	0.00	Pipe - (160)	0.00	0.00	0.00
Link-04	106.94	1.49	0.15	Pipe - (115) (1)	186.62	2.23	0.54	Pipe - (160) (1)	99.48	1.92	0.38
Link-05	106.65	1.42	0.16	Pipe - (116)	311.47	2.08	0.44	Pipe - (161)	0.00	0.00	0.00
Link-06	0.00	0.00	0.00	Pipe - (116) (1)	183.01	2.17	0.54	Pipe - (161) (1)	97.61	1.87	0.37
Link-07	0.00	0.00	0.00	Pipe - (117)	311.26	2.08	0.44	Pipe - (162)	0.00	0.00	0.00
Link-08	0.00	0.00	0.00	Pipe - (117) (1)	181.83	2.17	0.53	Pipe - (162) (1)	97.00	1.86	0.38
Link-09	0.00	0.00	0.00	Pipe - (118)	0.00	0.00	0.00	Pipe - (163)	311.18	2.08	0.44
Link-10	0.00	0.00	0.00	Pipe - (118) (1)	52.69	1.74	0.27	Pipe - (163) (1)	96.53	1.85	0.37
Link-11	0.00	0.00	0.00	Pipe - (119)	0.00	0.00	0.00	Pipe - (164)	311.23	2.08	0.44
Link-12	0.00	0.00	0.00	Pipe - (119) (1)	47.28	1.43	0.28	Pipe - (164) (1)	96.00	1.85	0.37
Link-13	0.00	0.00	0.00	Pipe - (120)	311.77	2.09	0.44	Pipe - (165)	0.00	0.00	0.00
Link-14	104.97	3.68	0.08	Pipe - (120) (1)	44.43	1.76	0.25	Pipe - (165) (1)	95.80	1.85	0.37
Link-15	104.99	1.31	0.16	Pipe - (121)	0.00	0.00	0.00	Pipe - (166)	0.00	0.00	0.00
Link-16	0.00	0.00	0.00	Pipe - (121) (1)	0.00	0.00	0.00	Pipe - (166) (1)	95.22	1.88	0.36
Link-17	0.00	0.00	0.00	Pipe - (122)	311.64	2.09	0.44	Pipe - (167)	0.00	0.00	0.00
Link-18	0.00	0.00	0.00	Pipe - (122) (1)	0.00	0.00	0.00	Pipe - (167) (1)	94.86	1.72	0.39
Link-19	0.00	0.00	0.00	Pipe - (123)	0.00	0.00	0.00	Pipe - (168)	0.00	0.00	0.00
Link-20	0.00	0.00	0.00	Pipe - (124)	0.00	0.00	0.00	Pipe - (168) (1)	94.75	1.83	0.37
Link-21	0.00	0.00	0.00	Pipe - (125)	0.00	0.00	0.00	Pipe - (169)	0.00	0.00	0.00
Link-22	0.00	0.00	0.00	Pipe - (126)	0.00	0.00	0.00	Pipe - (169) (1)	94.69	1.78	0.38
Link-23	0.00	0.00	0.00	Pipe - (126) (1)	0.00	0.00	0.00	Pipe - (170)	0.00	0.00	0.00
Link-24	0.00	0.00	0.00	Pipe - (127)	0.00	0.00	0.00	Pipe - (170) (1)	59.30	1.99	0.28
Link-25	0.00	0.00	0.00	Pipe - (128)	0.00	0.00	0.00	Pipe - (171)	0.00	0.00	0.00
Link-26	0.00	0.00	0.00	Pipe - (129)	0.00	0.00	0.00	Pipe - (171) (1)	57.78	1.78	0.28
Link-27	0.00	0.00	0.00	Pipe - (13) (1)	0.00	0.00	0.00	Pipe - (172)	54.51	1.94	0.25
Link-28	0.00	0.00	0.00	Pipe - (130)	0.00	0.00	0.00	Pipe - (172) (1)	55.86	1.69	0.28
Link-29	0.00	0.00	0.00	Pipe - (131)	0.00	0.00	0.00	Pipe - (173)	53.70	1.90	0.24
Link-30	0.00	0.00	0.00	Pipe - (131) (1)	0.00	0.00	0.00	Pipe - (173) (1)	54.53	1.65	0.27
Link-31	0.00	0.00	0.00	Pipe - (132)	0.00	0.00	0.00	Pipe - (174)	52.98	1.71	0.25
Link-32	58.54	1.58	0.11	Pipe - (133)	0.00	0.00	0.00	Pipe - (174) (1)	53.73	1.59	0.28
Link-33	55.99	1.47	0.10	Pipe - (133) (1)	0.00	0.00	0.00	Pipe - (175)	52.74	1.87	0.25
Link-34	53.35	1.07	0.12	Pipe - (134)	0.00	0.00	0.00	Pipe - (175) (1)	53.07	1.55	0.28
Link-35	54.04	1.15	0.12	Pipe - (135)	0.00	0.00	0.00	Pipe - (176)	0.00	0.00	0.00
Link-36	0.00	0.00	0.00	Pipe - (136)	0.00	0.00	0.00	Pipe - (176) (1)	52.53	1.57	0.27
Link-37	57.93	1.58	0.10	Pipe - (136) (1)	0.00	0.00	0.00	Pipe - (177)	59.22	3.00	0.21
Link-38	54.97	1.31	0.12	Pipe - (137)	0.00	0.00	0.00	Pipe - (177) (1)	52.39	1.54	0.27
Link-42	108.04	1.61	0.14	Pipe - (137) (1)	0.00	0.00	0.00	Pipe - (178)	55.01	2.47	0.21
Link-43	57.33	1.36	0.11	Pipe - (138)	0.00	0.00	0.00	Pipe - (178) (1)	94.62	1.82	0.37
Link-44	1976.05	2.58	1.00	Pipe - (139)	0.00	0.00	0.00	Pipe - (179)	0.00	0.00	0.00
Link-45	0.00	0.00	0.00	Pipe - (139) (1)	0.00	0.00	0.00	Pipe - (179) (1)	105.80	1.94	0.38
Link-46	0.00	0.00	0.00	Pipe - (14)	0.00	0.00	0.00	Pipe - (18)	0.00	0.00	0.00
Link-47	0.00	0.00	0.00	Pipe - (140)	0.00	0.00	0.00	Pipe - (180)	415.05	2.24	0.52
Link-48	0.00	0.00	0.00	Pipe - (140) (1)	0.00	0.00	0.00	Pipe - (180) (1)	67.16	2.21	0.27
Link-50	0.00	0.00	0.00	Pipe - (141)	0.00	0.00	0.00	Pipe - (181)	415.21	2.25	0.52
Link-51	0.00	0.00	0.00	Pipe - (141) (1)	0.00	0.00	0.00	Pipe - (181) (1)	58.64	1.59	0.30
Link-52	0.00	0.00	0.00	Pipe - (142)	311.72	2.09	0.44	Pipe - (182)	415.10	2.25	0.52
Link-53	0.00	0.00	0.00	Pipe - (142) (1)	0.00	0.00	0.00	Pipe - (182) (1)	56.54	1.62	0.28
Link-54	0.00	0.00	0.00	Pipe - (143)	311.43	2.08	0.44	Pipe - (183)	415.16	2.25	0.52
Link-55	0.00	0.00	0.00	Pipe - (143) (1)	0.00	0.00	0.00	Pipe - (183) (1)	55.53	1.62	0.28
Link-56	0.00	0.00	0.00	Pipe - (144)	0.00	0.00	0.00	Pipe - (184)	415.25	2.25	0.52
Link-57	0.00	0.00	0.00	Pipe - (145)	311.30	2.08	0.44	Pipe - (184) (1)	54.87	1.58	0.28
Link-59	0.00	0.00	0.00	Pipe - (145) (1)	0.00	0.00	0.00	Pipe - (185)	415.31	2.25	0.52
Link-60	0.00	0.00	0.00	Pipe - (146)	61.76	2.56	0.23	Pipe - (185) (1)	54.40	1.60	0.27
Link-61	0.00	0.00	0.00	Pipe - (147)	66.29	1.87	0.30	Pipe - (186)	415.17	2.24	0.52
Link-63	0.00	0.00	0.00	Pipe - (147) (1)	57.79	2.15	0.24	Pipe - (186) (1)	53.58	1.56	0.28
Link-65	1782.51	32.42	0.12	Pipe - (148)	59.55	2.71	0.20	Pipe - (187)	522.56	2.36	0.60
Pipe - (100)	0.00	0.00	0.00	Pipe - (148) (1)	55.85	1.71	0.27	Pipe - (187) (1)	0.00	0.00	0.00
Pipe - (100) (1)	0.00	0.00	0.00	Pipe - (149)	57.85	1.38	0.32	Pipe - (188)	521.30	2.37	0.60
Pipe - (101)	158.10	2.47	0.43	Pipe - (149) (1)	54.86	1.68	0.27	Pipe - (188) (1)	0.00	0.00	0.00
Pipe - (101) (1)	0.00	0.00	0.00	Pipe - (15)	0.00	0.00	0.00	Pipe - (189)	520.26	2.38	0.60
Pipe - (102)	157.02	2.43	0.43	Pipe - (150)	56.71	1.46	0.30	Pipe - (189) (1)	0.00	0.00	0.00
Pipe - (102) (1)	0.00	0.00	0.00	Pipe - (150) (1)	53.92	1.55	0.28	Pipe - (19)	0.00	0.00	0.00
Pipe - (104)	312.11	2.09	0.44	Pipe - (151)	55.92	1.37	0.31	Pipe - (190)	519.88	2.36	0.60
Pipe - (105)	0.00	0.00	0.00	Pipe - (151) (1)	53.12	1.61	0.27	Pipe - (190) (1)	200.15	2.26	0.40
Pipe - (106)	0.00	0.00	0.00	Pipe - (152)	55.09	1.73	0.26	Pipe - (191)	519.80	2.37	0.60
Pipe - (107)	311.80	2.08	0.44	Pipe - (152) (1)	52.64	1.61	0.27	Pipe - (191) (1)	0.00	0.00	0.00
Pipe - (107) (1)	103.67	2.26	0.36	Pipe - (153)	54.38	1.76	0.26	Pipe - (192)	0.00	0.00	0.00
Pipe - (108)	0.00	0.00	0.00	Pipe - (153) (1)	52.39	1.54	0.27	Pipe - (192) (1)	0.00	0.00	0.00
Pipe - (108) (1)	101.54	2.02	0.38	Pipe - (154)	53.57	1.73	0.25	Pipe - (193)	0.00	0.00	0.00
Pipe - (109)	0.00	0.00	0.00	Pipe - (154) (1)	52.09	1.52	0.28	Pipe - (193) (1)	0.00	0.00	0.00
Pipe - (109) (1)	100.03	1.91	0.38	Pipe - (155)	53.41	1.70	0.26	Pipe - (194)	0.00	0.00	0.00
Pipe - (110)	311.61	2.09	0.44	Pipe - (155) (1)	52.07	1.54	0.27	Pipe - (194) (1)	0.00	0.00	0.00
Pipe - (110) (1)	98.50	1.90	0.38	Pipe - (156)	53.32	1.85	0.24	Pipe - (195)	0.00	0.00	0.00
Pipe - (111)	311.52	2.08	0.44	Pipe - (156) (1)	52.01	1.60	0.26	Pipe - (195) (1)	64.02	1.84	0.30
Pipe - (111) (1)	144.75	2.21	0.45	Pipe - (157)	0.00	0.00	0.00	Pipe - (196)	0.00	0.00	0.00
Pipe - (112)	0.00	0.00	0.00	Pipe - (157) (1)	0.00	0.00	0.00	Pipe - (196) (1)	57.80	1.52	0.31
Pipe - (112) (1)	140.87	2.03	0.46	Pipe - (158)	0.00	0.00	0.00	Pipe - (197)	0.00	0.00	0.00
Pipe - (113)	0.00	0.00	0.00	Pipe - (158) (1)	0.00	0.00	0.00	Pipe - (198)	0.00	0.00	0.00
Pipe - (113) (1)	138.93	2.04	0.46	Pipe - (159)	0.00	0.00	0.00	Pipe - (198) (1)	0.00	0.00	0.00
Pipe - (114)	0.00	0.00	0.00	Pipe - (159) (1)	102.95	1.92	0.40	Pipe - (199)	0.00	0.00	0.00

## Pipe Results

Element ID	Peak Flow (gpm)	Peak Flow Velocity (ft/sec)	Peak Flow Depth/ Total Depth Ratio	Element ID	Peak Flow (gpm)	Peak Flow Velocity (ft/sec)	Peak Flow Depth/ Total Depth Ratio	Element ID	Peak Flow (gpm)	Peak Flow Velocity (ft/sec)	Peak Flow Depth/ Total Depth Ratio
Pipe - (199) (1)	63.91	1.87	0.30	Pipe - (243) (1)	539.32	2.40	0.43	Pipe - (282) (1)	0.00	0.00	0.00
Pipe - (2) (1)	0.00	0.00	0.00	Pipe - (244)	156.20	1.74	0.30	Pipe - (283)	0.00	0.00	0.00
Pipe - (20)	51.80	2.06	0.25	Pipe - (244) (1)	589.81	2.45	0.45	Pipe - (283) (1)	0.00	0.00	0.00
Pipe - (200)	0.00	0.00	0.00	Pipe - (245)	58.17	1.77	0.45	Pipe - (284)	0.00	0.00	0.00
Pipe - (200) (1)	57.82	1.54	0.31	Pipe - (245) (1)	589.44	2.45	0.45	Pipe - (284) (1)	0.00	0.00	0.00
Pipe - (201)	0.00	0.00	0.00	Pipe - (246)	0.00	0.00	0.00	Pipe - (285)	0.00	0.00	0.00
Pipe - (201) (1)	193.02	2.58	0.54	Pipe - (246) (1)	951.46	2.84	0.60	Pipe - (285) (1)	0.00	0.00	0.00
Pipe - (202)	0.00	0.00	0.00	Pipe - (247)	0.00	0.00	0.00	Pipe - (286)	0.00	0.00	0.00
Pipe - (202) (1)	180.87	2.20	0.56	Pipe - (247) (1)	962.49	3.08	0.56	Pipe - (286) (1)	0.00	0.00	0.00
Pipe - (203)	0.00	0.00	0.00	Pipe - (248)	57.64	1.77	0.28	Pipe - (287)	0.00	0.00	0.00
Pipe - (203) (1)	63.08	2.08	0.27	Pipe - (248) (1)	956.18	2.78	0.60	Pipe - (287) (1)	0.00	0.00	0.00
Pipe - (204)	0.00	0.00	0.00	Pipe - (249)	55.72	1.68	0.28	Pipe - (288)	0.00	0.00	0.00
Pipe - (204) (1)	58.01	1.73	0.28	Pipe - (249) (1)	0.00	0.00	0.00	Pipe - (288) (1)	0.00	0.00	0.00
Pipe - (205)	0.00	0.00	0.00	Pipe - (250)	55.51	4.59	0.13	Pipe - (289)	0.00	0.00	0.00
Pipe - (205) (1)	52.51	1.86	0.26	Pipe - (250) (1)	59.08	1.96	0.27	Pipe - (289) (1)	0.00	0.00	0.00
Pipe - (206)	0.00	0.00	0.00	Pipe - (251)	55.49	3.56	0.16	Pipe - (29)	0.00	0.00	0.00
Pipe - (206) (1)	47.31	1.54	0.27	Pipe - (251) (1)	57.94	1.85	0.28	Pipe - (290)	0.00	0.00	0.00
Pipe - (207)	0.00	0.00	0.00	Pipe - (252)	0.00	0.00	0.00	Pipe - (290) (1)	0.00	0.00	0.00
Pipe - (207) (1)	62.76	2.22	0.26	Pipe - (252) (1)	55.80	1.48	0.30	Pipe - (291)	0.00	0.00	0.00
Pipe - (208)	61.02	3.15	0.20	Pipe - (253)	58.11	3.11	0.30	Pipe - (291) (1)	0.00	0.00	0.00
Pipe - (208) (1)	57.97	1.84	0.27	Pipe - (253) (1)	54.54	1.39	0.31	Pipe - (292)	0.00	0.00	0.00
Pipe - (209)	57.30	2.40	0.22	Pipe - (254)	56.12	2.58	0.21	Pipe - (292) (1)	0.00	0.00	0.00
Pipe - (209) (1)	188.72	3.19	0.45	Pipe - (254) (1)	53.83	1.37	0.31	Pipe - (293)	0.00	0.00	0.00
Pipe - (21)	51.80	1.93	0.25	Pipe - (255)	53.45	2.44	0.21	Pipe - (294)	0.00	0.00	0.00
Pipe - (210)	55.17	2.02	0.24	Pipe - (255) (1)	51.80	1.79	0.27	Pipe - (295)	0.00	0.00	0.00
Pipe - (210) (1)	180.41	2.73	0.47	Pipe - (256)	54.97	1.79	0.27	Pipe - (296)	0.00	0.00	0.00
Pipe - (211)	54.92	1.99	0.24	Pipe - (256) (1)	0.00	0.00	0.00	Pipe - (297)	0.00	0.00	0.00
Pipe - (211) (1)	63.04	2.20	0.26	Pipe - (257)	54.29	1.60	0.27	Pipe - (298)	0.00	0.00	0.00
Pipe - (212)	53.92	1.97	0.24	Pipe - (257) (1)	0.00	0.00	0.00	Pipe - (299)	0.00	0.00	0.00
Pipe - (212) (1)	57.97	1.82	0.27	Pipe - (258)	53.95	1.59	0.27	Pipe - (299) (1)	0.00	0.00	0.00
Pipe - (213)	0.00	0.00	0.00	Pipe - (258) (1)	0.00	0.00	0.00	Pipe - (3)	0.00	0.00	0.00
Pipe - (214)	0.00	0.00	0.00	Pipe - (259)	53.06	1.64	0.27	Pipe - (30)	0.00	0.00	0.00
Pipe - (215)	64.09	3.09	0.21	Pipe - (259) (1)	0.00	0.00	0.00	Pipe - (300)	0.00	0.00	0.00
Pipe - (215) (1)	63.66	2.04	0.28	Pipe - (26)	0.00	0.00	0.00	Pipe - (300) (1)	0.00	0.00	0.00
Pipe - (216)	58.22	2.20	0.24	Pipe - (260)	108.71	3.59	0.25	Pipe - (301)	0.00	0.00	0.00
Pipe - (216) (1)	58.03	1.67	0.29	Pipe - (260) (1)	0.00	0.00	0.00	Pipe - (301) (1)	0.00	0.00	0.00
Pipe - (217)	55.96	1.45	0.31	Pipe - (261)	107.67	3.61	0.25	Pipe - (302)	0.00	0.00	0.00
Pipe - (218)	56.87	1.86	0.25	Pipe - (261) (1)	0.00	0.00	0.00	Pipe - (302) (1)	0.00	0.00	0.00
Pipe - (218) (1)	54.80	1.41	0.31	Pipe - (262)	106.92	3.58	0.25	Pipe - (303)	0.00	0.00	0.00
Pipe - (219)	0.00	0.00	0.00	Pipe - (262) (1)	0.00	0.00	0.00	Pipe - (303) (1)	0.00	0.00	0.00
Pipe - (219) (1)	107.34	1.64	0.44	Pipe - (263)	106.62	3.57	0.25	Pipe - (304)	0.00	0.00	0.00
Pipe - (22)	54.31	1.95	0.25	Pipe - (263) (1)	0.00	0.00	0.00	Pipe - (304) (1)	0.00	0.00	0.00
Pipe - (220)	0.00	0.00	0.00	Pipe - (264)	106.34	1.71	0.42	Pipe - (305)	0.00	0.00	0.00
Pipe - (220) (1)	284.22	2.09	0.91	Pipe - (264) (1)	0.00	0.00	0.00	Pipe - (305) (1)	0.00	0.00	0.00
Pipe - (221)	0.00	0.00	0.00	Pipe - (265)	106.47	1.78	0.42	Pipe - (306)	0.00	0.00	0.00
Pipe - (221) (1)	284.26	2.08	1.00	Pipe - (265) (1)	0.00	0.00	0.00	Pipe - (306) (1)	0.00	0.00	0.00
Pipe - (222)	108.51	2.31	0.35	Pipe - (266)	0.00	0.00	0.00	Pipe - (307)	0.00	0.00	0.00
Pipe - (222) (1)	283.17	2.01	1.00	Pipe - (266) (1)	0.00	0.00	0.00	Pipe - (307) (1)	0.00	0.00	0.00
Pipe - (223)	291.04	2.04	1.00	Pipe - (267)	0.00	0.00	0.00	Pipe - (308)	0.00	0.00	0.00
Pipe - (224)	290.25	2.02	1.00	Pipe - (267) (1)	0.00	0.00	0.00	Pipe - (309)	0.00	0.00	0.00
Pipe - (225)	284.28	1.84	1.00	Pipe - (268)	61.92	3.29	0.30	Pipe - (309) (1)	0.00	0.00	0.00
Pipe - (226)	317.97	2.11	0.60	Pipe - (268) (1)	0.00	0.00	0.00	Pipe - (310)	0.00	0.00	0.00
Pipe - (227)	316.95	2.10	0.60	Pipe - (269)	57.83	2.17	0.37	Pipe - (310) (1)	0.00	0.00	0.00
Pipe - (228)	370.01	2.16	0.66	Pipe - (269) (1)	0.00	0.00	0.00	Pipe - (311)	0.00	0.00	0.00
Pipe - (229)	369.41	2.16	0.66	Pipe - (27)	0.00	0.00	0.00	Pipe - (311) (1)	0.00	0.00	0.00
Pipe - (23)	53.68	1.85	0.25	Pipe - (270)	55.85	1.74	0.27	Pipe - (312)	0.00	0.00	0.00
Pipe - (230) (1)	368.59	2.17	0.66	Pipe - (270) (1)	0.00	0.00	0.00	Pipe - (312) (1)	0.00	0.00	0.00
Pipe - (231)	0.00	0.00	0.00	Pipe - (271)	0.00	0.00	0.00	Pipe - (313)	0.00	0.00	0.00
Pipe - (231) (1)	368.17	2.17	0.66	Pipe - (271) (1)	0.00	0.00	0.00	Pipe - (313) (1)	0.00	0.00	0.00
Pipe - (232)	0.00	0.00	0.00	Pipe - (272)	0.00	0.00	0.00	Pipe - (314)	0.00	0.00	0.00
Pipe - (232) (1)	368.02	2.18	0.66	Pipe - (272) (1)	0.00	0.00	0.00	Pipe - (315)	0.00	0.00	0.00
Pipe - (233)	0.00	0.00	0.00	Pipe - (273)	0.00	0.00	0.00	Pipe - (315) (1)	0.00	0.00	0.00
Pipe - (234)	0.00	0.00	0.00	Pipe - (273) (1)	0.00	0.00	0.00	Pipe - (316)	0.00	0.00	0.00
Pipe - (235)	0.00	0.00	0.00	Pipe - (274)	0.00	0.00	0.00	Pipe - (316) (1)	0.00	0.00	0.00
Pipe - (235) (1)	52.24	1.46	0.21	Pipe - (274) (1)	0.00	0.00	0.00	Pipe - (317)	0.00	0.00	0.00
Pipe - (236)	0.00	0.00	0.00	Pipe - (275)	0.00	0.00	0.00	Pipe - (317) (1)	57.67	1.67	0.29
Pipe - (236) (1)	158.78	1.82	0.39	Pipe - (275) (1)	0.00	0.00	0.00	Pipe - (318)	64.38	2.05	0.28
Pipe - (237)	0.00	0.00	0.00	Pipe - (276)	0.00	0.00	0.00	Pipe - (318) (1)	55.76	1.51	0.30
Pipe - (237) (1)	210.63	1.99	0.45	Pipe - (276) (1)	0.00	0.00	0.00	Pipe - (319)	58.23	1.75	0.28
Pipe - (238)	0.00	0.00	0.00	Pipe - (277)	0.00	0.00	0.00	Pipe - (319) (1)	54.45	1.47	0.30
Pipe - (238) (1)	262.33	2.01	0.53	Pipe - (277) (1)	0.00	0.00	0.00	Pipe - (32)	0.00	0.00	0.00
Pipe - (239)	0.00	0.00	0.00	Pipe - (278)	0.00	0.00	0.00	Pipe - (320)	56.53	1.67	0.27
Pipe - (239) (1)	314.15	2.32	0.41	Pipe - (278) (1)	0.00	0.00	0.00	Pipe - (320) (1)	54.15	1.34	0.31
Pipe - (24)	53.10	1.77	0.26	Pipe - (279)	0.00	0.00	0.00	Pipe - (321)	55.39	1.57	0.28
Pipe - (240)	158.02	1.74	0.31	Pipe - (279) (1)	0.00	0.00	0.00	Pipe - (321) (1)	53.48	1.35	0.31
Pipe - (240) (1)	314.14	2.09	0.44	Pipe - (28)	0.00	0.00	0.00	Pipe - (322)	54.55	1.36	0.31
Pipe - (241)	157.19	1.73	0.31	Pipe - (280)	0.00	0.00	0.00	Pipe - (323)	54.31	1.55	0.28
Pipe - (241) (1)	539.63	2.97	0.51	Pipe - (280) (1)	0.00	0.00	0.00	Pipe - (324)	53.65	1.71	0.26
Pipe - (242)	156.50	1.77	0.30	Pipe - (281)	0.00	0.00	0.00	Pipe - (325)	53.37	1.54	0.27
Pipe - (242) (1)	539.20	2.49	0.42	Pipe - (281) (1)	0.00	0.00	0.00	Pipe - (326)	53.04	1.52	0.28
Pipe - (243)	156.19	1.73	0.30	Pipe - (282)	0.00	0.00	0.00	Pipe - (326) (1)	0.00	0.00	0.00

## Pipe Results

Element ID	Peak Flow (gpm)	Peak Flow Velocity (ft/sec)	Peak Flow Depth/ Total Depth Ratio	Element ID	Peak Flow (gpm)	Peak Flow Velocity (ft/sec)	Peak Flow Depth/ Total Depth Ratio	Element ID	Peak Flow (gpm)	Peak Flow Velocity (ft/sec)	Peak Flow Depth/ Total Depth Ratio
Pipe - (327)	52.60	1.55	0.27	Pipe - (368) (1)	0.00	0.00	0.00	Pipe - (408)	0.00	0.00	0.00
Pipe - (327) (1)	0.00	0.00	0.00	Pipe - (369)	415.22	2.20	0.29	Pipe - (408) (1)	0.00	0.00	0.00
Pipe - (328)	52.54	1.62	0.26	Pipe - (369) (1)	0.00	0.00	0.00	Pipe - (409)	933.27	2.74	0.45
Pipe - (328) (1)	0.00	0.00	0.00	Pipe - (37)	0.00	0.00	0.00	Pipe - (409) (1)	59.12	2.37	0.37
Pipe - (329)	104.21	1.84	0.40	Pipe - (370)	415.11	2.21	0.29	Pipe - (41)	0.00	0.00	0.00
Pipe - (329) (1)	0.00	0.00	0.00	Pipe - (370) (1)	0.00	0.00	0.00	Pipe - (410)	936.66	2.79	0.44
Pipe - (33)	0.00	0.00	0.00	Pipe - (371)	414.93	2.23	0.28	Pipe - (410) (1)	0.00	0.00	0.00
Pipe - (330)	103.76	1.83	0.39	Pipe - (371) (1)	0.00	0.00	0.00	Pipe - (411)	936.01	2.74	0.45
Pipe - (330) (1)	0.00	0.00	0.00	Pipe - (372)	0.00	0.00	0.00	Pipe - (412)	935.85	2.75	0.45
Pipe - (331)	103.66	1.82	0.39	Pipe - (372) (1)	0.00	0.00	0.00	Pipe - (412) (1)	58.19	1.58	0.31
Pipe - (331) (1)	109.07	1.73	0.44	Pipe - (373)	0.00	0.00	0.00	Pipe - (413)	935.55	2.76	0.45
Pipe - (332)	103.85	1.89	0.39	Pipe - (373) (1)	0.00	0.00	0.00	Pipe - (413) (1)	56.28	1.47	0.31
Pipe - (333)	103.81	1.89	0.38	Pipe - (374)	58.10	1.94	0.26	Pipe - (414)	936.67	2.76	0.45
Pipe - (333) (1)	0.00	0.00	0.00	Pipe - (374) (1)	0.00	0.00	0.00	Pipe - (414) (1)	111.80	1.72	0.44
Pipe - (334)	103.73	2.39	0.32	Pipe - (375)	55.86	1.79	0.27	Pipe - (415)	0.00	0.00	0.00
Pipe - (334) (1)	0.00	0.00	0.00	Pipe - (375) (1)	0.00	0.00	0.00	Pipe - (415) (1)	108.39	1.62	0.32
Pipe - (335)	103.72	2.46	0.31	Pipe - (376)	54.16	3.57	0.18	Pipe - (416)	22.40	1.12	0.07
Pipe - (335) (1)	0.00	0.00	0.00	Pipe - (376) (1)	110.72	2.11	0.38	Pipe - (416) (1)	106.93	1.60	0.32
Pipe - (336)	103.69	2.35	0.33	Pipe - (377)	107.39	2.02	0.38	Pipe - (417)	26.53	1.20	0.07
Pipe - (337)	0.00	0.00	0.00	Pipe - (377) (1)	63.26	2.29	0.26	Pipe - (417) (1)	105.81	1.60	0.32
Pipe - (338)	0.00	0.00	0.00	Pipe - (378)	0.00	0.00	0.00	Pipe - (418)	25.39	1.11	0.07
Pipe - (339)	64.15	2.16	0.27	Pipe - (378) (1)	58.08	1.85	0.27	Pipe - (418) (1)	105.32	1.59	0.32
Pipe - (339) (1)	0.00	0.00	0.00	Pipe - (379)	52.83	3.52	0.26	Pipe - (419)	24.54	1.03	0.07
Pipe - (34)	0.00	0.00	0.00	Pipe - (379) (1)	55.83	1.83	0.26	Pipe - (419) (1)	0.00	0.00	0.00
Pipe - (340)	58.90	1.99	0.25	Pipe - (38)	0.00	0.00	0.00	Pipe - (42)	58.32	3.11	0.20
Pipe - (340) (1)	52.69	1.40	0.29	Pipe - (380)	0.00	0.00	0.00	Pipe - (42) (1)	63.21	2.16	0.27
Pipe - (341)	56.86	1.94	0.25	Pipe - (380) (1)	55.02	2.39	0.21	Pipe - (420)	24.10	0.98	0.07
Pipe - (341) (1)	52.47	1.40	0.30	Pipe - (381)	55.69	3.31	0.28	Pipe - (420) (1)	0.00	0.00	0.00
Pipe - (342)	55.84	1.89	0.25	Pipe - (381) (1)	54.99	2.85	0.13	Pipe - (421)	23.82	0.98	0.07
Pipe - (342) (1)	57.80	2.05	0.41	Pipe - (382) (1)	62.89	2.29	0.26	Pipe - (421) (1)	0.00	0.00	0.00
Pipe - (343)	55.17	1.90	0.24	Pipe - (383)	0.00	0.00	0.00	Pipe - (422)	23.62	0.97	0.07
Pipe - (343) (1)	0.00	0.00	0.00	Pipe - (383) (1)	58.61	1.62	0.30	Pipe - (422) (1)	0.00	0.00	0.00
Pipe - (344)	54.49	1.37	0.31	Pipe - (384)	0.00	0.00	0.00	Pipe - (423)	23.47	0.96	0.07
Pipe - (345)	54.31	1.32	0.31	Pipe - (384) (1)	56.66	1.64	0.28	Pipe - (423) (1)	0.00	0.00	0.00
Pipe - (345) (1)	0.00	0.00	0.00	Pipe - (385)	0.00	0.00	0.00	Pipe - (424)	23.35	0.95	0.07
Pipe - (346)	53.99	1.33	0.31	Pipe - (385) (1)	55.30	1.61	0.28	Pipe - (424) (1)	0.00	0.00	0.00
Pipe - (346) (1)	0.00	0.00	0.00	Pipe - (386)	0.00	0.00	0.00	Pipe - (425)	23.26	0.95	0.07
Pipe - (347)	53.72	1.33	0.31	Pipe - (386) (1)	0.00	0.00	0.00	Pipe - (425) (1)	109.10	1.65	0.32
Pipe - (347) (1)	0.00	0.00	0.00	Pipe - (387)	0.00	0.00	0.00	Pipe - (426)	23.18	0.95	0.07
Pipe - (348)	53.65	1.32	0.31	Pipe - (387) (1)	0.00	0.00	0.00	Pipe - (426) (1)	210.46	1.93	0.46
Pipe - (348) (1)	0.00	0.00	0.00	Pipe - (388)	0.00	0.00	0.00	Pipe - (427)	51.59	1.37	0.10
Pipe - (349)	53.12	1.33	0.31	Pipe - (388) (1)	0.00	0.00	0.00	Pipe - (427) (1)	263.89	2.04	0.53
Pipe - (349) (1)	0.00	0.00	0.00	Pipe - (389)	0.00	0.00	0.00	Pipe - (428)	50.28	1.45	0.09
Pipe - (35)	0.00	0.00	0.00	Pipe - (389) (1)	57.74	2.39	0.24	Pipe - (428) (1)	319.74	2.11	0.60
Pipe - (350)	53.12	1.31	0.30	Pipe - (39)	0.00	0.00	0.00	Pipe - (429)	0.00	0.00	0.00
Pipe - (350) (1)	63.45	2.01	0.28	Pipe - (390)	0.00	0.00	0.00	Pipe - (429) (1)	0.00	0.00	0.00
Pipe - (351)	52.79	1.55	0.27	Pipe - (390) (1)	58.41	1.86	0.27	Pipe - (43)	57.58	2.17	0.24
Pipe - (351) (1)	58.80	1.45	0.32	Pipe - (391)	0.00	0.00	0.00	Pipe - (43) (1)	57.68	1.79	0.27
Pipe - (352)	52.69	1.54	0.27	Pipe - (391) (1)	56.70	1.66	0.28	Pipe - (430)	0.00	0.00	0.00
Pipe - (352) (1)	56.26	1.73	0.27	Pipe - (392)	0.00	0.00	0.00	Pipe - (431)	0.00	0.00	0.00
Pipe - (353)	52.49	1.52	0.27	Pipe - (392) (1)	59.44	2.44	0.24	Pipe - (431) (1)	0.00	0.00	0.00
Pipe - (353) (1)	0.00	0.00	0.00	Pipe - (393)	52.79	1.50	0.28	Pipe - (432)	0.00	0.00	0.00
Pipe - (354)	0.00	0.00	0.00	Pipe - (393) (1)	57.76	2.08	0.24	Pipe - (432) (1)	0.00	0.00	0.00
Pipe - (354) (1)	63.02	2.17	0.40	Pipe - (394)	0.00	0.00	0.00	Pipe - (433)	0.00	0.00	0.00
Pipe - (355)	0.00	0.00	0.00	Pipe - (394) (1)	57.54	2.51	0.23	Pipe - (433) (1)	0.00	0.00	0.00
Pipe - (355) (1)	57.86	3.09	0.28	Pipe - (395)	0.00	0.00	0.00	Pipe - (434)	0.00	0.00	0.00
Pipe - (356)	0.00	0.00	0.00	Pipe - (395) (1)	57.75	2.05	0.25	Pipe - (434) (1)	0.00	0.00	0.00
Pipe - (356) (1)	109.62	1.78	0.44	Pipe - (396)	0.00	0.00	0.00	Pipe - (435)	0.00	0.00	0.00
Pipe - (357)	0.00	0.00	0.00	Pipe - (396) (1)	62.47	2.52	0.24	Pipe - (435) (1)	0.00	0.00	0.00
Pipe - (357) (1)	0.00	0.00	0.00	Pipe - (397)	0.00	0.00	0.00	Pipe - (436)	0.00	0.00	0.00
Pipe - (358)	0.00	0.00	0.00	Pipe - (397) (1)	0.00	0.00	0.00	Pipe - (436) (1)	0.00	0.00	0.00
Pipe - (358) (1)	0.00	0.00	0.00	Pipe - (398)	61.81	2.08	0.27	Pipe - (437)	0.00	0.00	0.00
Pipe - (359) (1)	0.00	0.00	0.00	Pipe - (398) (1)	0.00	0.00	0.00	Pipe - (437) (1)	0.00	0.00	0.00
Pipe - (36)	0.00	0.00	0.00	Pipe - (399)	57.39	1.74	0.28	Pipe - (438)	0.00	0.00	0.00
Pipe - (360)	156.14	1.64	0.18	Pipe - (399) (1)	0.00	0.00	0.00	Pipe - (438) (1)	0.00	0.00	0.00
Pipe - (360) (1)	0.00	0.00	0.00	Pipe - (4)	0.00	0.00	0.00	Pipe - (439)	0.00	0.00	0.00
Pipe - (361)	156.04	1.64	0.18	Pipe - (40)	0.00	0.00	0.00	Pipe - (439) (1)	0.00	0.00	0.00
Pipe - (361) (1)	0.00	0.00	0.00	Pipe - (400)	55.76	1.70	0.28	Pipe - (44)	0.00	0.00	0.00
Pipe - (362)	155.95	1.64	0.18	Pipe - (400) (1)	0.00	0.00	0.00	Pipe - (44) (1)	55.48	1.73	0.27
Pipe - (362) (1)	0.00	0.00	0.00	Pipe - (401)	54.79	1.56	0.28	Pipe - (440)	0.00	0.00	0.00
Pipe - (363)	259.32	1.96	0.23	Pipe - (401) (1)	0.00	0.00	0.00	Pipe - (440) (1)	0.00	0.00	0.00
Pipe - (363) (1)	0.00	0.00	0.00	Pipe - (402)	53.93	1.62	0.27	Pipe - (441)	0.00	0.00	0.00
Pipe - (364)	259.30	1.93	0.23	Pipe - (402) (1)	63.75	2.59	0.24	Pipe - (441) (1)	0.00	0.00	0.00
Pipe - (364) (1)	0.00	0.00	0.00	Pipe - (403)	53.46	1.56	0.28	Pipe - (442)	0.00	0.00	0.00
Pipe - (365)	259.38	1.94	0.23	Pipe - (403) (1)	58.02	1.70	0.28	Pipe - (442) (1)	0.00	0.00	0.00
Pipe - (365) (1)	0.00	0.00	0.00	Pipe - (404)	53.21	1.58	0.27	Pipe - (443)	0.00	0.00	0.00
Pipe - (366)	259.97	1.96	0.23	Pipe - (404) (1)	56.51	1.69	0.28	Pipe - (443) (1)	472.14	2.33	0.56
Pipe - (366) (1)	0.00	0.00	0.00	Pipe - (405)	58.55	2.42	0.36	Pipe - (444)	0.00	0.00	0.00
Pipe - (367)	364.44	2.14	0.27	Pipe - (406)	53.01	1.52	0.28	Pipe - (444) (1)	471.92	2.32	0.56
Pipe - (367) (1)	0.00	0.00	0.00	Pipe - (406) (1)	0.00	0.00	0.00	Pipe - (445)	0.00	0.00	0.00
Pipe - (368)	363.97	2.12	0.27	Pipe - (407)	0.00	0.00	0.00	Pipe - (445) (1)	471.77	2.32	0.56



## Pipe Results

Element ID	Peak Flow (gpm)	Peak Flow Velocity (ft/sec)	Peak Flow Depth/ Total Depth Ratio	Element ID	Peak Flow (gpm)	Peak Flow Velocity (ft/sec)	Peak Flow Depth/ Total Depth Ratio	Element ID	Peak Flow (gpm)	Peak Flow Velocity (ft/sec)	Peak Flow Depth/ Total Depth Ratio
Pipe - (446)	0.00	0.00	0.00	Pipe - (484) (1)	9.80	1.15	0.15	Pipe - (540)	0.00	0.00	0.00
Pipe - (446) (1)	471.56	2.32	0.56	Pipe - (485)	29.56	1.50	0.20	Pipe - (541)	0.00	0.00	0.00
Pipe - (447)	0.00	0.00	0.00	Pipe - (485) (1)	9.80	2.42	0.09	Pipe - (542)	0.00	0.00	0.00
Pipe - (447) (1)	471.36	2.31	0.56	Pipe - (486)	0.00	0.00	0.00	Pipe - (543)	65.45	1.86	0.30
Pipe - (448)	0.00	0.00	0.00	Pipe - (486) (1)	9.80	2.27	0.10	Pipe - (544)	58.01	1.52	0.31
Pipe - (448) (1)	471.12	2.32	0.56	Pipe - (487)	115.92	2.10	0.23	Pipe - (545)	55.91	1.42	0.31
Pipe - (449)	0.00	0.00	0.00	Pipe - (487) (1)	141.40	2.96	0.53	Pipe - (546)	103.43	1.84	0.40
Pipe - (449) (1)	470.96	2.31	0.56	Pipe - (488)	103.19	1.70	0.24	Pipe - (547)	0.00	0.00	0.00
Pipe - (45)	0.00	0.00	0.00	Pipe - (488) (1)	131.67	3.19	0.31	Pipe - (548)	0.00	0.00	0.00
Pipe - (45) (1)	54.26	1.60	0.28	Pipe - (489)	101.15	1.55	0.24	Pipe - (549)	0.00	0.00	0.00
Pipe - (450)	0.00	0.00	0.00	Pipe - (489) (1)	141.24	1.79	0.51	Pipe - (55)	0.00	0.00	0.00
Pipe - (450) (1)	67.17	1.81	0.18	Pipe - (49)	0.00	0.00	0.00	Pipe - (55) (1)	0.00	0.00	0.00
Pipe - (451)	0.00	0.00	0.00	Pipe - (49) (1)	104.08	1.82	0.40	Pipe - (550)	0.00	0.00	0.00
Pipe - (451) (1)	528.12	2.38	0.61	Pipe - (490)	99.27	1.54	0.24	Pipe - (551)	3.96	1.08	0.06
Pipe - (452)	0.00	0.00	0.00	Pipe - (490) (1)	190.77	1.97	0.61	Pipe - (552)	0.00	0.00	0.00
Pipe - (452) (1)	525.98	2.38	0.60	Pipe - (491)	97.21	1.56	0.24	Pipe - (553)	0.00	0.00	0.00
Pipe - (453)	0.00	0.00	0.00	Pipe - (491) (1)	187.11	1.91	0.61	Pipe - (554)	52.46	2.06	0.24
Pipe - (453) (1)	582.67	2.47	0.45	Pipe - (492)	97.02	1.50	0.24	Pipe - (555)	47.19	1.58	0.26
Pipe - (454)	0.00	0.00	0.00	Pipe - (492) (1)	187.27	3.86	0.35	Pipe - (556)	45.37	1.52	0.25
Pipe - (454) (1)	578.50	2.45	0.45	Pipe - (493)	441.87	3.94	0.22	Pipe - (556) (1)	45.09	1.46	0.25
Pipe - (455)	0.00	0.00	0.00	Pipe - (493) (1)	233.54	2.06	0.70	Pipe - (557)	44.48	1.48	0.25
Pipe - (455) (1)	577.17	2.44	0.45	Pipe - (494)	480.48	2.50	0.31	Pipe - (558)	44.29	1.55	0.24
Pipe - (456)	0.00	0.00	0.00	Pipe - (494) (1)	229.80	1.94	0.72	Pipe - (559)	43.60	1.56	0.24
Pipe - (456) (1)	576.10	3.46	0.34	Pipe - (495)	914.75	3.09	0.42	Pipe - (56)	0.00	0.00	0.00
Pipe - (457)	0.00	0.00	0.00	Pipe - (495) (1)	53.54	2.00	0.26	Pipe - (56) (1)	0.00	0.00	0.00
Pipe - (457) (1)	575.23	2.42	0.64	Pipe - (496)	963.57	2.88	0.45	Pipe - (560)	0.00	0.00	0.00
Pipe - (458)	0.00	0.00	0.00	Pipe - (496) (1)	58.82	1.93	0.27	Pipe - (561)	0.00	0.00	0.00
Pipe - (458) (1)	574.83	2.42	0.64	Pipe - (497)	943.13	2.79	0.45	Pipe - (562)	0.00	0.00	0.00
Pipe - (459)	0.00	0.00	0.00	Pipe - (497) (1)	56.33	1.69	0.27	Pipe - (563)	59.35	2.41	0.24
Pipe - (459) (1)	574.49	2.41	0.64	Pipe - (498)	1128.68	2.93	0.49	Pipe - (564)	55.38	1.91	0.25
Pipe - (46)	0.00	0.00	0.00	Pipe - (498) (1)	55.19	1.70	0.27	Pipe - (565)	54.25	1.92	0.24
Pipe - (46) (1)	52.92	1.57	0.28	Pipe - (499)	1206.89	6.25	0.29	Pipe - (57)	53.05	1.81	0.14
Pipe - (460)	0.00	0.00	0.00	Pipe - (499) (1)	54.47	1.63	0.28	Pipe - (57) (1)	58.76	2.10	0.26
Pipe - (460) (1)	574.40	2.41	0.64	Pipe - (5)	0.00	0.00	0.00	Pipe - (579)	54.67	1.68	0.27
Pipe - (461)	0.00	0.00	0.00	Pipe - (50)	0.00	0.00	0.00	Pipe - (58)	55.73	2.19	0.13
Pipe - (461) (1)	574.33	2.41	0.64	Pipe - (50) (1)	107.16	2.29	0.34	Pipe - (58) (1)	57.43	1.88	0.27
Pipe - (462)	0.00	0.00	0.00	Pipe - (500)	1213.10	2.96	0.52	Pipe - (580)	841.70	3.18	0.70
Pipe - (462) (1)	574.39	2.77	0.57	Pipe - (500) (1)	54.33	1.53	0.28	Pipe - (582)	214.21	2.34	0.57
Pipe - (463)	0.00	0.00	0.00	Pipe - (501)	53.53	1.54	0.28	Pipe - (583)	1320.60	3.63	0.63
Pipe - (463) (1)	574.44	2.84	0.56	Pipe - (502)	105.79	2.18	0.35	Pipe - (586)	0.00	0.00	0.00
Pipe - (464)	0.00	0.00	0.00	Pipe - (503)	105.21	1.72	0.42	Pipe - (588)	0.00	0.00	0.00
Pipe - (464) (1)	574.42	3.27	0.50	Pipe - (504)	104.91	1.93	0.38	Pipe - (589)	0.00	0.00	0.00
Pipe - (465)	981.51	3.49	0.25	Pipe - (505)	104.87	1.88	0.39	Pipe - (59)	51.80	1.52	0.18
Pipe - (466)	980.92	2.98	0.28	Pipe - (506)	0.00	0.00	0.00	Pipe - (59) (1)	55.74	1.66	0.28
Pipe - (467)	979.58	2.73	0.30	Pipe - (507)	58.89	2.72	0.22	Pipe - (591)	109.01	1.86	0.40
Pipe - (467) (1)	26.10	1.07	0.21	Pipe - (508)	56.83	2.28	0.23	Pipe - (593)	0.00	0.00	0.00
Pipe - (468)	979.08	2.72	0.30	Pipe - (509)	54.70	2.14	0.23	Pipe - (594)	0.00	0.00	0.00
Pipe - (468) (1)	26.10	1.67	0.16	Pipe - (51)	0.00	0.00	0.00	Pipe - (6)	0.00	0.00	0.00
Pipe - (469)	978.95	2.72	0.30	Pipe - (510)	54.57	1.70	0.28	Pipe - (60)	58.30	1.59	0.18
Pipe - (469) (1)	87.35	2.06	0.34	Pipe - (511)	53.81	1.56	0.28	Pipe - (60) (1)	54.48	1.64	0.27
Pipe - (47)	0.00	0.00	0.00	Pipe - (512)	0.00	0.00	0.00	Pipe - (61)	55.94	1.42	0.18
Pipe - (47) (1)	104.92	1.63	0.44	Pipe - (513)	0.00	0.00	0.00	Pipe - (61) (1)	53.76	1.57	0.28
Pipe - (470)	978.81	2.72	0.30	Pipe - (514)	0.00	0.00	0.00	Pipe - (62)	54.89	1.38	0.18
Pipe - (470) (1)	84.07	1.87	0.34	Pipe - (515)	0.00	0.00	0.00	Pipe - (62) (1)	52.81	1.61	0.27
Pipe - (471)	978.58	2.76	0.30	Pipe - (516)	64.75	2.11	0.27	Pipe - (63)	54.13	1.34	0.18
Pipe - (471) (1)	82.02	1.78	0.34	Pipe - (517)	164.61	2.09	0.50	Pipe - (63) (1)	52.34	1.79	0.25
Pipe - (472)	978.41	2.75	0.30	Pipe - (518)	215.94	2.20	0.60	Pipe - (64)	157.53	1.86	0.30
Pipe - (472) (1)	81.15	1.75	0.34	Pipe - (519)	215.90	2.57	0.53	Pipe - (64) (1)	52.10	1.35	0.30
Pipe - (473)	978.24	2.73	0.30	Pipe - (52)	0.00	0.00	0.00	Pipe - (65)	156.42	1.74	0.30
Pipe - (473) (1)	52.46	2.01	0.24	Pipe - (520)	213.45	2.60	0.52	Pipe - (65) (1)	52.03	1.56	0.27
Pipe - (474)	978.13	2.73	0.30	Pipe - (521)	212.84	2.58	0.52	Pipe - (66)	156.38	1.80	0.30
Pipe - (474) (1)	64.35	2.08	0.28	Pipe - (522)	214.04	2.14	0.63	Pipe - (66) (1)	51.94	1.84	0.24
Pipe - (475)	978.06	2.73	0.30	Pipe - (523)	66.57	1.90	0.45	Pipe - (67)	156.49	1.79	0.30
Pipe - (475) (1)	58.47	1.73	0.28	Pipe - (524)	58.56	1.51	0.48	Pipe - (67) (1)	0.00	0.00	0.00
Pipe - (476)	978.00	2.74	0.30	Pipe - (525)	58.38	1.37	0.49	Pipe - (68)	156.66	1.78	0.30
Pipe - (476) (1)	55.73	1.70	0.27	Pipe - (526)	0.00	0.00	0.00	Pipe - (68) (1)	0.00	0.00	0.00
Pipe - (477)	513.44	2.22	1.00	Pipe - (527)	0.00	0.00	0.00	Pipe - (69)	156.62	1.77	0.30
Pipe - (477) (1)	54.74	1.60	0.28	Pipe - (528)	0.00	0.00	0.00	Pipe - (69) (1)	60.08	2.08	0.27
Pipe - (478)	70.57	1.43	0.15	Pipe - (529)	0.00	0.00	0.00	Pipe - (70)	156.84	1.76	0.30
Pipe - (478) (1)	54.26	1.37	0.31	Pipe - (53)	0.00	0.00	0.00	Pipe - (70) (1)	57.57	1.82	0.27
Pipe - (479)	73.95	1.51	0.15	Pipe - (530)	0.00	0.00	0.00	Pipe - (71)	156.69	1.76	0.30
Pipe - (479) (1)	53.72	1.73	0.26	Pipe - (531)	0.00	0.00	0.00	Pipe - (71) (1)	55.31	1.67	0.28
Pipe - (48)	0.00	0.00	0.00	Pipe - (532)	0.00	0.00	0.00	Pipe - (72)	157.39	1.75	0.30
Pipe - (48) (1)	104.36	2.23	0.34	Pipe - (533)	0.00	0.00	0.00	Pipe - (72) (1)	54.36	1.65	0.27
Pipe - (481)	48.28	1.63	0.10	Pipe - (534)	0.00	0.00	0.00	Pipe - (73)	157.14	1.73	0.31
Pipe - (481) (1)	0.00	0.00	0.00	Pipe - (535)	0.00	0.00	0.00	Pipe - (73) (1)	53.87	1.57	0.28
Pipe - (482)	46.74	1.30	0.12	Pipe - (536)	0.00	0.00	0.00	Pipe - (74)	157.02	1.74	0.31
Pipe - (482) (1)	0.00	0.00	0.00	Pipe - (537)	0.00	0.00	0.00	Pipe - (74) (1)	53.11	1.59	0.27
Pipe - (483)	51.82	1.43	0.12	Pipe - (538)	0.00	0.00	0.00	Pipe - (75)	52.16	1.58	0.27
Pipe - (483) (1)	0.00	0.00	0.00	Pipe - (539)	0.00	0.00	0.00	Pipe - (76)	52.10	1.57	0.27
Pipe - (484)	25.21	1.20	0.15	Pipe - (54)	0.00	0.00	0.00	Pipe - (77)	52.00	1.56	0.27



Pipe Results

Element ID	Peak Flow	Peak Flow Velocity	Peak Flow Depth/ Total Depth Ratio
	(gpm)	(ft/sec)	
Pipe - (79)	51.80	2.24	0.23
Pipe - (80)	53.87	2.28	0.23
Pipe - (80) (1)	55.58	1.50	0.30
Pipe - (81)	55.52	1.74	0.27
Pipe - (82)	54.00	1.61	0.28
Pipe - (83)	156.85	1.73	0.31
Pipe - (83) (1)	53.65	1.63	0.27
Pipe - (84)	156.83	1.73	0.31
Pipe - (84) (1)	53.12	1.57	0.27
Pipe - (85)	156.70	1.72	0.30
Pipe - (85) (1)	52.78	1.54	0.28
Pipe - (86)	63.58	3.02	0.21
Pipe - (86) (1)	52.22	1.52	0.28
Pipe - (87)	57.76	2.50	0.21
Pipe - (87) (1)	52.23	1.54	0.27
Pipe - (88)	55.48	2.07	0.24
Pipe - (88) (1)	52.06	1.58	0.27
Pipe - (89)	54.50	1.95	0.24
Pipe - (89) (1)	0.00	0.00	0.00
Pipe - (90)	62.54	2.71	0.23
Pipe - (90) (1)	0.00	0.00	0.00
Pipe - (91)	57.65	2.64	0.21
Pipe - (91) (1)	0.00	0.00	0.00
Pipe - (92)	0.00	0.00	0.00
Pipe - (93)	106.61	2.29	0.34
Pipe - (93) (1)	0.00	0.00	0.00
Pipe - (94)	106.25	2.23	0.35
Pipe - (94) (1)	0.00	0.00	0.00
Pipe - (95)	105.46	2.21	0.35
Pipe - (95) (1)	0.00	0.00	0.00
Pipe - (96)	61.75	3.20	0.20
Pipe - (96) (1)	0.00	0.00	0.00
Pipe - (97)	58.25	1.92	0.26
Pipe - (97) (1)	0.00	0.00	0.00
Pipe - (98)	55.24	3.78	0.15
Pipe - (98) (1)	0.00	0.00	0.00
Pipe - (99)	159.42	2.55	0.43
Pipe - (99) (1)	0.00	0.00	0.00

Element ID	Peak Flow	Peak Flow Velocity	Peak Flow Depth/ Total Depth Ratio
	(gpm)	(ft/sec)	

Element ID	Peak Flow	Peak Flow Velocity	Peak Flow Depth/ Total Depth Ratio
	(gpm)	(ft/sec)	

## Appendix C

### Project Alternatives Cost Estimates

PROBABLE CONSTRUCTION COST ESTIMATE				Project No. 180377	
180377 Chowchilla-Fairmead				Quad Knopf	
Chowchilla, CA				2816 Park Avenue	
A1.3 Add New New Bar Screen Structure				Merced, CA 95348	
ITEM	QUANTITY		DESCRIPTION	UNIT PRICE	AMOUNT
SITE IMPROVEMENTS					
1	1	LS	MOBILIZATION	\$20,000.00	\$20,000
2	1	LS	DEMOLITON, REMOVAL AND DISPOSAL	\$15,000.00	\$15,000
3	1	EA	NEW BAR SCREEN STRUCTURE & PIPING	\$300,000.00	\$300,000
SUBTOTAL COST OF IMPROVEMENTS					\$335,000
Contingency 20%					\$67,000
TOTAL OF IMPROVEMENTS					\$402,000
Engineering (25%)					\$83,750.00
Total					\$485,750.00

PROBABLE CONSTRUCTION COST ESTIMATE				Project No. 180377	
180377 Chowchilla-Fairmead				Quad Knopf	
Chowchilla, CA				2816 Park Avenue	
A2.2 Replace Chain Scrapers				Merced, CA 95348	
ITEM	QUANTITY		DESCRIPTION	UNIT PRICE	AMOUNT
SITE IMPROVEMENTS					
1	1	LS	MOBILIZATION	\$15,000.00	\$15,000
2	1	LS	DEMOLITON, REMOVAL AND DISPOSAL	\$15,000.00	\$15,000
3	2	EA	NEW CHAIN SCRAPERS	\$300,000.00	\$600,000
SUBTOTAL COST OF IMPROVEMENTS					\$630,000
Contingency 20%					\$126,000
TOTAL OF IMPROVEMENTS					\$756,000
Engineering (10%)					\$63,000.00
Total					\$819,000.00

PROBABLE CONSTRUCTION COST ESTIMATE					Project No. 180377	
180377 Chowchilla-Fairmead					Quad Knopf	
Chowchilla, CA					2816 Park Avenue	
A3.2 Replace Timers and Sludge Pumps					Merced, CA 95348	
ITEM	QUANTITY		DESCRIPTION	UNIT PRICE	AMOUNT	
SITE IMPROVEMENTS						
1	1	LS	MOBILIZATION	\$15,000.00	\$15,000	
2	1	LS	DEMOLITON, REMOVAL AND DISPOSAL	\$15,000.00	\$15,000	
3	1	LS	NEW TIMERS	\$5,000.00	\$5,000	
4	1	LS	NEW SLUDGE PUMPS	\$40,000.00	\$40,000	
SUBTOTAL COST OF IMPROVEMENTS						
\$75,000						
Contingency 20%						
\$15,000						

***TOTAL OF IMPROVEMENTS*** ***\$90,000***

Engineering (15%) \$11,250.00

Total \$101,250.00

PROBABLE CONSTRUCTION COST ESTIMATE				Project No. 180377	
180377 Chowchilla-Fairmead				Quad Knopf	
Chowchilla, CA				2816 Park Avenue	
A4.2 Replace Main Air Transmission Line and Diffusers				Merced, CA 95348	
ITEM	QUANTITY		DESCRIPTION	UNIT PRICE	AMOUNT
SITE IMPROVEMENTS					
1	1	LS	MOBILIZATION	\$15,000.00	\$15,000
2	1	LS	DEMOLITON, REMOVAL AND DISPOSAL	\$15,000.00	\$15,000
3	1	LS	NEW AIR TRANSMISSION LINE	\$50,000.00	\$50,000
4	1	LS	NEW DIFFUSERS	\$100,000.00	\$100,000
5	1	LS	NEW DO SENSORS	\$25,000.00	\$25,000
6	1	LS	NEW VFDS ON BLOWERS	\$200,000.00	\$200,000
7	1	LS	NEW ELECTRICAL	\$100,000.00	\$100,000
SUBTOTAL COST OF IMPROVEMENTS					\$505,000
Contingency 20%					\$101,000
TOTAL OF IMPROVEMENTS					\$606,000
Engineering (15%)					\$75,750.00
Total					\$681,750.00

PROBABLE CONSTRUCTION COST ESTIMATE				Project No. 180377	
180377 Chowchilla-Fairmead				Quad Knopf	
Chowchilla, CA				2816 Park Avenue	
A5.2 Replace Blower Valves and Motors					
1	1	LS	MOBILIZATION	\$10,000.00	\$10,000
2	1	LS	DEMOLITON, REMOVAL AND DISPOSAL	\$15,000.00	\$15,000
3	1	LS	NEW BLOWER VALVES	\$50,000.00	\$50,000
4	1	LS	NEW BLOWER MOTORS	\$120,000.00	\$120,000
SUBTOTAL COST OF IMPROVEMENTS					\$195,000
Contingency 20%					\$39,000

***TOTAL OF IMPROVEMENTS*** ***\$234,000***

Engineering (15%) \$29,250.00

Total \$263,250.00



PROBABLE CONSTRUCTION COST ESTIMATE				Project No. 180377	
180377 Chowchilla-Fairmead				Quad Knopf	
Chowchilla, CA				2816 Park Avenue	
A6.2 Replace Hatches & Ladder				Merced, CA 95348	
ITEM	QUANTITY		DESCRIPTION	UNIT PRICE	AMOUNT
SITE IMPROVEMENTS					
1	1	LS	MOBILIZATION	\$5,000.00	\$5,000
2	1	LS	DEMOLITON, REMOVAL AND DISPOSAL	\$8,000.00	\$8,000
3	1	LS	NEW HATCHES & LADDER	\$25,000.00	\$25,000
SUBTOTAL COST OF IMPROVEMENTS					\$38,000
Contingency 20%					\$7,600
TOTAL OF IMPROVEMENTS					\$45,600
Engineering (10%)					\$3,800.00
Total					\$49,400.00

PROBABLE CONSTRUCTION COST ESTIMATE				Project No. 180377	
180377 Chowchilla-Fairmead				Quad Knopf	
Chowchilla, CA				2816 Park Avenue	
A7.2 Repair Digester Structure				Merced, CA 95348	
ITEM	QUANTITY		DESCRIPTION	UNIT PRICE	AMOUNT
SITE IMPROVEMENTS					
1	1	LS	MOBILIZATION	\$8,000.00	\$8,000
2	1	LS	DEMOLITON, REMOVAL AND DISPOSAL	\$5,000.00	\$5,000
3	1	EA	REPAIR DIGESTER STRUCTURE	\$25,000.00	\$25,000
SUBTOTAL COST OF IMPROVEMENTS					\$38,000
Contingency 20%					\$7,600

<b>TOTAL OF IMPROVEMENTS</b>	<b>\$45,600</b>
Engineering (10%)	\$3,800.00
Total	\$49,400.00

PROBABLE CONSTRUCTION COST ESTIMATE				Project No. 180377	
180377 Chowchilla-Fairmead				Quad Knopf	
Chowchilla, CA				2816 Park Avenue	
A8.2 Install New Screw Press & Shelter				Merced, CA 95348	
ITEM	QUANTITY		DESCRIPTION	UNIT PRICE	AMOUNT
SITE IMPROVEMENTS					
1	1	LS	MOBILIZATION	\$20,000.00	\$20,000
2	1	LS	DEMOLITON, REMOVAL AND DISPOSAL	\$10,000.00	\$10,000
3	1	EA	NEW SCREW PRESS, CONVEYOR, ETC.	\$500,000.00	\$500,000
4	1	EA	NEW SHELTER	\$350,000.00	\$350,000
SUBTOTAL COST OF IMPROVEMENTS					\$880,000
Contingency 20%					\$176,000

***TOTAL OF IMPROVEMENTS*** ***\$1,056,000***

Engineering (25%) \$220,000.00

Total \$1,276,000.00

PROBABLE CONSTRUCTION COST ESTIMATE					Project No. 180377	
180377 Chowchilla-Fairmead					Quad Knopf	
Chowchilla, CA					2816 Park Avenue	
A9.3 Install SCADA					Merced, CA 95348	
ITEM	QUANTITY		DESCRIPTION	UNIT PRICE	AMOUNT	
SITE IMPROVEMENTS						
1	1	LS	MOBILIZATION	\$15,000.00	\$15,000	
2	1	LS	DEMOLITON, REMOVAL AND DISPOSAL	\$5,000.00	\$5,000	
3	1	EA	NEW SCADA & MONITORING EQUIPMENT	\$350,000.00	\$350,000	
4	1	EA	NEW ELECTRICAL	\$75,000.00	\$75,000	
SUBTOTAL COST OF IMPROVEMENTS					\$445,000	
Contingency 20%					\$89,000	

***TOTAL OF IMPROVEMENTS*** ***\$534,000***

Engineering (25%) \$111,250.00

Total \$645,250.00

PROBABLE CONSTRUCTION COST ESTIMATE				Project No. 180377	
180377 Chowchilla-Fairmead				Quad Knopf	
Chowchilla, CA				2816 Park Avenue	
A10.2 Replace Gauges				Merced, CA 95348	
ITEM	QUANTITY		DESCRIPTION	UNIT PRICE	AMOUNT
SITE IMPROVEMENTS					
1	1	LS	MOBILIZATION	\$2,000.00	\$2,000
2	1	LS	DEMOLITON, REMOVAL AND DISPOSAL	\$1,000.00	\$1,000
3	1	EA	NEW GAUGES	\$5,000.00	\$5,000
SUBTOTAL COST OF IMPROVEMENTS					\$8,000
Contingency 20%					\$1,600
TOTAL OF IMPROVEMENTS					\$9,600
Engineering (15%)					\$1,200.00
Total					\$10,800.00

**PROBABLE CONSTRUCTION COST ESTIMATE**  
**180377 Chowchilla-Fairmead**  
**Chowchilla, CA**  
**A11.2 Upsize Main at Circle & Ventura**

**Project No. 180377**  
**Quad Knopf**  
**2816 Park Avenue**  
**Merced, CA 95348**

ITEM	QUANTITY		DESCRIPTION	UNIT PRICE	AMOUNT
SITE IMPROVEMENTS					
1	1	LS	MOBILIZATION	\$10,000.00	\$10,000
2	1	LS	SAWCUT, DEMOLITON, REMOVAL AND DISPOSAL	\$10,000.00	\$10,000
3	1	LS	TRAFFIC CONTROL	\$10,000.00	\$10,000
4	1,560	LF	NEW 10" SEWER PIPE	\$70.00	\$109,200
5	36	EA	NEW 4" SEWER SERVICE LATERAL	\$2,000.00	\$72,000
6	4	EA	NEW SEWER MANHOLE	\$6,000.00	\$24,000
7	1	LS	BYPASS PUMPING (CONSTRUCTION)	\$15,000.00	\$15,000
8	1	LS	SHORING, SHEETING & BRACING	\$10,000.00	\$10,000
9	9,120	SF	AC SECTION TRENCH REPLACEMENT	\$13.00	\$118,560
SUBTOTAL COST OF IMPROVEMENTS					\$378,760
Contingency 20%					\$75,752

**TOTAL OF IMPROVEMENTS** **\$454,512**

Engineering (15%) \$56,814.00

Total \$511,326.00

<b>PROBABLE CONSTRUCTION COST ESTIMATE</b>				<b>Project No. 180377</b>	
<b>180377 Chowchilla-Fairmead</b>				<b>Quad Knopf</b>	
<b>Chowchilla, CA</b>				<b>2816 Park Avenue</b>	
<b>A12.2 Upsize Main at Ninth &amp; Sonoma</b>				<b>Merced, CA 95348</b>	
<b>ITEM</b>	<b>QUANTITY</b>		<b>DESCRIPTION</b>	<b>UNIT PRICE</b>	<b>AMOUNT</b>
<b>SITE IMPROVEMENTS</b>					
1	1	LS	MOBILIZATION	\$10,000.00	\$10,000
2	1	LS	SAWCUT, DEMOLITON, REMOVAL AND DISPOSAL	\$10,000.00	\$10,000
3	1	LS	TRAFFIC CONTROL	\$10,000.00	\$10,000
4	700	LF	NEW 10" SEWER PIPE	\$70.00	\$49,000
5	24	EA	NEW 4" SEWER SERVICE LATERAL	\$2,000.00	\$48,000
6	2	EA	NEW SEWER MANHOLE	\$6,000.00	\$12,000
7	1	LS	BYPASS PUMPING (CONSTRUCTION)	\$15,000.00	\$15,000
8	1	LS	SHORING, SHEETING & BRACING	\$10,000.00	\$10,000
9	4,720	SF	AC SECTION TRENCH REPLACEMENT	\$13.00	\$61,360
<b>SUBTOTAL COST OF IMPROVEMENTS</b>					<b>\$225,360</b>
<b>Contingency 20%</b>					<b>\$45,072</b>

**TOTAL OF IMPROVEMENTS** **\$270,432**

Engineering (15%) \$33,804.00

Total \$304,236.00



**PROBABLE CONSTRUCTION COST ESTIMATE**  
**180377 Chowchilla-Fairmead**  
**Chowchilla, CA**  
**A13.2 Upsize Main at Monterey & Lake**

**Project No. 180377**  
**Quad Knopf**  
**2816 Park Avenue**  
**Merced, CA 95348**

ITEM	QUANTITY		DESCRIPTION	UNIT PRICE	AMOUNT
SITE IMPROVEMENTS					
1	1	LS	MOBILIZATION	\$10,000.00	\$10,000
2	1	LS	SAWCUT, DEMOLITON, REMOVAL AND DISPOSAL	\$15,000.00	\$15,000
3	1	LS	TRAFFIC CONTROL	\$10,000.00	\$10,000
4	350	LF	NEW 10" SEWER PIPE	\$70.00	\$24,500
5	24	EA	NEW 4" SEWER SERVICE LATERAL	\$2,000.00	\$48,000
6	1	EA	NEW SEWER MANHOLE	\$6,000.00	\$6,000
7	1	LS	BYPASS PUMPING (CONSTRUCTION)	\$15,000.00	\$15,000
8	1	LS	SHORING, SHEETING & BRACING	\$10,000.00	\$10,000
9	3,320	SF	AC SECTION TRENCH REPLACEMENT	\$13.00	\$43,160
SUBTOTAL COST OF IMPROVEMENTS					\$181,660
Contingency 20%					\$36,332

**TOTAL OF IMPROVEMENTS** **\$217,992**

Engineering (15%) \$27,249.00

Total \$245,241.00

**PROBABLE CONSTRUCTION COST ESTIMATE**  
**180377 Chowchilla-Fairmead**  
**Chowchilla, CA**  
**A14.2 Upsize Main at Monterey & Sonoma**

**Project No. 180377**  
**Quad Knopf**  
**2816 Park Avenue**  
**Merced, CA 95348**

ITEM	QUANTITY		DESCRIPTION	UNIT PRICE	AMOUNT
SITE IMPROVEMENTS					
1	1	LS	MOBILIZATION	\$10,000.00	\$10,000
2	1	LS	SAWCUT, DEMOLITON, REMOVAL AND DISPOSAL	\$15,000.00	\$15,000
3	1	LS	TRAFFIC CONTROL	\$10,000.00	\$10,000
4	350	LF	NEW 10" SEWER PIPE	\$70.00	\$24,500
5	24	EA	NEW 4" SEWER SERVICE LATERAL	\$2,000.00	\$48,000
6	1	EA	NEW SEWER MANHOLE	\$6,000.00	\$6,000
7	1	LS	BYPASS PUMPING (CONSTRUCTION)	\$15,000.00	\$15,000
8	1	LS	SHORING, SHEETING & BRACING	\$10,000.00	\$10,000
9	3,320	SF	AC SECTION TRENCH REPLACEMENT	\$13.00	\$43,160
SUBTOTAL COST OF IMPROVEMENTS					\$181,660
Contingency 20%					\$36,332

**TOTAL OF IMPROVEMENTS** **\$217,992**

Engineering (15%) \$27,249.00

Total \$245,241.00

PROBABLE CONSTRUCTION COST ESTIMATE				Project No. 180377	
180377 Chowchilla-Fairmead				Quad Knopf	
Chowchilla, CA				2816 Park Avenue	
A15.2 Upsize Main at Myer				Merced, CA 95348	
ITEM	QUANTITY		DESCRIPTION	UNIT PRICE	AMOUNT
SITE IMPROVEMENTS					
1	1	LS	MOBILIZATION	\$25,000.00	\$25,000
2	1	LS	SAWCUT, DEMOLITON, REMOVAL AND DISPOSAL	\$15,000.00	\$15,000
3	1	LS	TRAFFIC CONTROL	\$10,000.00	\$10,000
4	1,325	LF	NEW 24" SEWER PIPE	\$120.00	\$159,000
5	726	LF	NEW 18" SEWER PIPE	\$100.00	\$72,600
6	10	EA	NEW 4" SEWER SERVICE LATERAL	\$2,000.00	\$20,000
7	5	EA	NEW SEWER MANHOLE	\$6,000.00	\$30,000
8	1	LS	BYPASS PUMPING (CONSTRUCTION)	\$15,000.00	\$15,000
9	1	LS	SHORING, SHEETING & BRACING	\$10,000.00	\$10,000
10	9,004	SF	AC SECTION TRENCH REPLACEMENT	\$13.00	\$117,052
SUBTOTAL COST OF IMPROVEMENTS					\$473,652
Contingency 20%					\$94,730

**TOTAL OF IMPROVEMENTS** **\$568,382**

Engineering (15%) \$71,047.80

Total \$639,430.20

PROBABLE CONSTRUCTION COST ESTIMATE					Project No. 180377	
180377 Chowchilla-Fairmead					Quad Knopf	
Chowchilla, CA					2816 Park Avenue	
A16.2 Upsize Main at High School Campus					Merced, CA 95348	
ITEM	QUANTITY		DESCRIPTION		UNIT PRICE	AMOUNT
SITE IMPROVEMENTS						
1	1	LS	MOBILIZATION		\$15,000.00	\$15,000
2	1	LS	SAWCUT, DEMOLITON, REMOVAL AND DISPOSAL		\$10,000.00	\$10,000
3	1	LS	TRAFFIC CONTROL		\$2,000.00	\$2,000
4	1,060	LF	NEW 12" SEWER PIPE		\$85.00	\$90,100
5	4	EA	NEW 4" SEWER SERVICE LATERAL		\$2,000.00	\$8,000
6	3	EA	NEW SEWER MANHOLE		\$6,000.00	\$18,000
7	1	LS	BYPASS PUMPING (CONSTRUCTION)		\$15,000.00	\$15,000
8	1	LS	SHORING, SHEETING & BRACING		\$10,000.00	\$10,000
9	4,564	SF	AC SECTION TRENCH REPLACEMENT		\$13.00	\$59,332
SUBTOTAL COST OF IMPROVEMENTS						\$227,432
Contingency 20%						\$45,486

**TOTAL OF IMPROVEMENTS** **\$272,918**

Engineering (15%) \$34,114.80

Total \$307,033.20

<b>PROBABLE CONSTRUCTION COST ESTIMATE</b>				<b>Project No. 180377</b>	
<b>180377 Chowchilla-Fairmead</b>				<b>Quad Knopf</b>	
<b>Chowchilla, CA</b>				<b>2816 Park Avenue</b>	
<b>A17.2 Upsize Main Near Farnesi's Steakhouse</b>				<b>Merced, CA 95348</b>	
<b>ITEM</b>	<b>QUANTITY</b>		<b>DESCRIPTION</b>	<b>UNIT PRICE</b>	<b>AMOUNT</b>
<b>SITE IMPROVEMENTS</b>					
1	1	LS	MOBILIZATION	\$15,000.00	\$15,000
2	1	LS	SAWCUT, DEMOLITON, REMOVAL AND DISPOSAL	\$10,000.00	\$10,000
3	1	LS	TRAFFIC CONTROL	\$10,000.00	\$10,000
4	975	LF	NEW 10" SEWER PIPE	\$70.00	\$68,250
5	24	EA	NEW 4" SEWER SERVICE LATERAL	\$2,000.00	\$48,000
6	2	EA	NEW SEWER MANHOLE	\$6,000.00	\$12,000
7	1	LS	BYPASS PUMPING (CONSTRUCTION)	\$15,000.00	\$15,000
8	1	LS	SHORING, SHEETING & BRACING	\$10,000.00	\$10,000
9	5,820	SF	AC SECTION TRENCH REPLACEMENT	\$13.00	\$75,660
<b>SUBTOTAL COST OF IMPROVEMENTS</b>					<b>\$263,910</b>
<b>Contingency 20%</b>					<b>\$52,782</b>

**TOTAL OF IMPROVEMENTS** **\$316,692**

Engineering (15%) \$39,586.50

Total \$356,278.50

**PROBABLE CONSTRUCTION COST ESTIMATE**

180377 Chowchilla-Fairmead

Chowchilla, CA

A18.2 Upsize Main at Road 16 and 24 1/2

Project No. 180377

Quad Knopf

2816 Park Avenue

Merced, CA 95348

ITEM	QUANTITY		DESCRIPTION	UNIT PRICE	AMOUNT
SITE IMPROVEMENTS					
1	1	LS	MOBILIZATION	\$10,000.00	\$10,000
2	1	LS	SAWCUT, DEMOLITON, REMOVAL AND DISPOSAL	\$10,000.00	\$10,000
3	1	LS	TRAFFIC CONTROL	\$10,000.00	\$10,000
4	26	LF	NEW 24" SEWER PIPE	\$150.00	\$3,900
5	2	EA	NEW MANHOLE	\$15,000.00	\$30,000
6	1	LS	BYPASS PUMPING (CONSTRUCTION)	\$20,000.00	\$20,000
7	1	LS	SHORING, SHEETING & BRACING	\$15,000.00	\$15,000
8	150	SF	AC SECTION TRENCH REPLACEMENT	\$15.00	\$2,250
SUBTOTAL COST OF IMPROVEMENTS					\$101,150
Contingency 20%					\$20,230

**TOTAL OF IMPROVEMENTS****\$121,380**

Engineering (15%)

\$15,172.50

Total

\$136,552.50

PROBABLE CONSTRUCTION COST ESTIMATE					Project No. 180377	
180377 Chowchilla-Fairmead					Quad Knopf	
Chowchilla, CA					2816 Park Avenue	
A19.2 Install Permanent Generators at Lift Stations					Merced, CA 95348	
ITEM	QUANTITY		DESCRIPTION	UNIT PRICE	AMOUNT	
SITE IMPROVEMENTS						
1	1	LS	MOBILIZATION	\$30,000.00	\$30,000	
2	1	LS	DEMOLITON, REMOVAL AND DISPOSAL	\$25,000.00	\$25,000	
3	4	EA	BACKUP GENERATOR	\$150,000.00	\$600,000	
4	4	EA	ELECTRICAL	\$15,000.00	\$60,000	
SUBTOTAL COST OF IMPROVEMENTS					\$715,000	
Contingency 20%					\$143,000	

***TOTAL OF IMPROVEMENTS*** ***\$858,000***

Engineering (15%) \$107,250.00

Total \$965,250.00

PROBABLE CONSTRUCTION COST ESTIMATE				Project No. 180377	
180377 Chowchilla-Fairmead				Quad Knopf	
Chowchilla, CA				2816 Park Avenue	
A20.2 Install New Lockable Hatch at Amador Lift Station				Merced, CA 95348	
ITEM	QUANTITY		DESCRIPTION	UNIT PRICE	AMOUNT
SITE IMPROVEMENTS					
1	1	LS	MOBILIZATION	\$1,000.00	\$1,000
2	1	LS	DEMOLITON, REMOVAL AND DISPOSAL	\$1,000.00	\$1,000
3	1	LS	NEW HATCH	\$6,000.00	\$6,000
SUBTOTAL COST OF IMPROVEMENTS					\$8,000
Contingency 20%					\$1,600
TOTAL OF IMPROVEMENTS					\$9,600
Engineering (15%)					\$1,200.00
Total					\$10,800.00



PROBABLE CONSTRUCTION COST ESTIMATE				Project No. 180377	
180377 Chowchilla-Fairmead				Quad Knopf	
Chowchilla, CA				2816 Park Avenue	
A21.2 Replace Pumps with Chopper Impeller				Merced, CA 95348	
ITEM	QUANTITY		DESCRIPTION	UNIT PRICE	AMOUNT
SITE IMPROVEMENTS					
1	1	LS	MOBILIZATION	\$5,000.00	\$5,000
2	1	LS	DEMOLITON, REMOVAL AND DISPOSAL	\$10,000.00	\$10,000
3	2	EA	NEW CHOPPER IMPELLER PUMPS & RAILS	\$30,000.00	\$60,000
SUBTOTAL COST OF IMPROVEMENTS					\$75,000
Contingency 20%					\$15,000

<b>TOTAL OF IMPROVEMENTS</b>	<b>\$90,000</b>
Engineering (15%)	\$11,250.00
Total	\$101,250.00

PROBABLE CONSTRUCTION COST ESTIMATE					Project No. 180377	
180377 Chowchilla-Fairmead					Quad Knopf	
Chowchilla, CA					2816 Park Avenue	
A22.2 Replace Level Controls with Ultrasonic Level Transducer					Merced, CA 95348	
ITEM	QUANTITY		DESCRIPTION		UNIT PRICE	AMOUNT
SITE IMPROVEMENTS						
1	1	LS	MOBILIZATION		\$3,000.00	\$3,000
2	1	LS	DEMOLITON, REMOVAL AND DISPOSAL		\$5,000.00	\$5,000
3	1	LS	NEW ULTRASONIC TRANSDUCER		\$10,000.00	\$10,000
4	1	LS	WIRING MODICATIONS		\$5,000.00	\$5,000
SUBTOTAL COST OF IMPROVEMENTS						
						\$23,000
Contingency 20%						\$4,600

**TOTAL OF IMPROVEMENTS** **\$27,600**

Engineering (15%) \$3,450.00

Total \$31,050.00

<b>PROBABLE CONSTRUCTION COST ESTIMATE</b> <b>180377 Chowchilla-Fairmead</b> <b>Chowchilla, CA</b> <b>A23.2 Install Bypass pipeline at Each Lift Station</b>			<b>Project No. 180377</b> <b>Quad Knopf</b> <b>2816 Park Avenue</b> <b>Merced, CA 95348</b>		
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ITEM	QUANTITY		DESCRIPTION	UNIT PRICE	AMOUNT
SITE IMPROVEMENTS					
1	1	LS	MOBILIZATION	\$15,000.00	\$15,000
2	1	LS	DEMOLITON, REMOVAL AND DISPOSAL	\$15,000.00	\$15,000
3	4	EA	CONNECTION AT EXISTING LIFT STATION	\$5,000.00	\$20,000
4	4	EA	CONNECTION AT EXISTING MANHOL	\$5,000.00	\$20,000
5	400	LF	8" PVC PIPELINE	\$150.00	\$60,000
6	1,600	SF	REPLACE ASPHALT IN TRENCH	\$13.00	\$20,800
7	1	LS	TEMPORARY PUMPING & HANDLING	\$50,000.00	\$50,000
SUBTOTAL COST OF IMPROVEMENTS					\$200,800
Contingency 20%					\$40,160

**TOTAL OF IMPROVEMENTS** **\$240,960**

Engineering (20%) \$40,160.00

Total \$281,120.00

PROBABLE CONSTRUCTION COST ESTIMATE					Project No. 180377	
180377 Chowchilla-Fairmead					Quad Knopf	
Chowchilla, CA					2816 Park Avenue	
B1.2 Construct 0.9 MGD Package Treatment Plant					Merced, CA 95348	
ITEM		QUANTITY		DESCRIPTION	UNIT PRICE	AMOUNT
SITE IMPROVEMENTS						
1	1	LS	MOBILIZATION		\$250,000.00	\$250,000
2	1	LS	DEMO & REMOVAL		\$250,000.00	\$250,000
3	1	LS	NEW 0.90 MGD PACKAGE PLANT		\$7,500,000.00	\$7,500,000
4	1	LS	MODIFICATIONS TO EXISTING SITE		\$500,000.00	\$500,000
SUBTOTAL COST OF IMPROVEMENTS						\$8,500,000
Contingency 20%						\$1,700,000

***TOTAL OF IMPROVEMENTS*** ***\$10,200,000***

Engineering (10%) \$850,000.00

Total \$11,050,000.00

PROBABLE CONSTRUCTION COST ESTIMATE					Project No. 180377	
180377 Chowchilla-Fairmead					Quad Knopf	
Chowchilla, CA					2816 Park Avenue	
B1.5 Construct New 0.50 MGD Package Treatment Plant					Merced, CA 95348	
ITEM	QUANTITY		DESCRIPTION		UNIT PRICE	AMOUNT
SITE IMPROVEMENTS						
1	1	LS	MOBILIZATION		\$200,000.00	\$200,000
2	1	LS	DEMO & REMOVAL		\$175,000.00	\$175,000
3	1	LS	NEW 0.50 MGD PACKAGE PLANT		\$5,250,000.00	\$5,250,000
4	1	LS	MODIFICATIONS TO EXISTING SITE		\$350,000.00	\$350,000
SUBTOTAL COST OF IMPROVEMENTS						\$5,975,000
Contingency 20%						\$1,195,000

**TOTAL OF IMPROVEMENTS** **\$7,170,000**

Engineering (10%) \$597,500.00

Total \$7,767,500.00

PROBABLE CONSTRUCTION COST ESTIMATE				Project No. 180377	
180377 Chowchilla-Fairmead				Quad Knopf	
Chowchilla, CA				2816 Park Avenue	
B1.6 Install Bypass Piping and New Aeration Basin					
1	1	LS	MOBILIZATION	\$60,000.00	\$60,000
2	1	LS	DEMOLITON, REMOVAL AND DISPOSAL	\$75,000.00	\$75,000
3	1	LS	NEW VALVES & PIPING TO ALLOW BYPASS	\$300,000.00	\$300,000
4	1	LS	NEW AERATION BASIN, DIFFUSERS & BLOWERS	\$600,000.00	\$600,000
SUBTOTAL COST OF IMPROVEMENTS					\$1,035,000
Contingency 20%					\$207,000

***TOTAL OF IMPROVEMENTS*** ***\$1,242,000***

Engineering (15%) \$155,250.00

Total \$1,397,250.00

<b>PROBABLE CONSTRUCTION COST ESTIMATE</b>				<b>Project No. 180377</b>	
<b>180377 Chowchilla-Fairmead</b>				<b>Quad Knopf</b>	
<b>Chowchilla, CA</b>				<b>2816 Park Avenue</b>	
<b>B2.3 New Collection System &amp; Force Main to Extended 18" Ind. Main</b>				<b>Merced, CA 95348</b>	
<b>ITEM</b>	<b>QUANTITY</b>		<b>DESCRIPTION</b>	<b>UNIT PRICE</b>	<b>AMOUNT</b>
<b>SITE IMPROVEMENTS</b>					
1	1	LS	MOBILIZATION	\$100,000.00	\$100,000
2	1	LS	SAWCUT, DEMOLITON, REMOVAL AND DISPOSAL	\$60,000.00	\$60,000
3	1	LS	TRAFFIC CONTROL	\$65,000.00	\$65,000
4	23,416	LF	NEW 8" SEWER PIPE	\$80.00	\$1,873,280
5	12,175	LF	NEW 18" SEWER PIPE	\$120.00	\$1,461,000
6	177	EA	NEW 4" SEWER SERVICE LATERAL	\$2,500.00	\$442,500
7	177	EA	PRIVATE PROPERTY IMPROVEMENTS	\$1,500.00	\$265,500
8	177	EA	ABANDON ONSITE SEPTIC	\$1,500.00	\$265,500
9	89	EA	NEW SEWER MANHOLE	\$6,000.00	\$534,000
10	5	EA	NEW SEWER CLEANOUT	\$2,500.00	\$12,500
11	1	EA	LIFT STATION & GENERATOR	\$250,000.00	\$250,000
12	8,500	LF	NEW FORCE MAIN PIPING-DIRECT BORE	\$90.00	\$765,000
13	1	LS	SHORING, SHEETING & BRACING	\$50,000.00	\$50,000
14	142,364	SF	AC SECTION TRENCH REPLACEMENT	\$11.00	\$1,566,004
<b>SUBTOTAL COST OF IMPROVEMENTS</b>					<b>\$7,710,284</b>
<b>Contingency 20%</b>					<b>\$1,542,057</b>

**TOTAL OF IMPROVEMENTS** **\$9,252,341**

Engineering (20%) \$1,542,056.80

Total \$10,794,397.60

**APPENDIX C**  
**AIR QUALITY & GREENHOUSE GAS IMPACT ANALYSIS**



# Fairmead Wastewater System Improvements Project

## Air Quality & Greenhouse Gas Impact Assessment

April 2020

**Prepared for:**

QK  
2816 Park Avenue  
Merced, CA 95348

**Prepared by:**

VRPA Technologies, Inc.  
4630 W. Jennifer, Suite 105  
Fresno, CA 93722  
Project Manager: Jason Ellard



## **Fairmead Wastewater System Improvements Project Air Quality & Greenhouse Gas Impact Assessment**

### **Study Team**

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  - ✓ Jason Ellard, Transportation Engineer, VRPA Technologies, Inc., [jellard@vrpatechnologies.com](mailto:jellard@vrpatechnologies.com), (559) 271-1200
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## Executive Summary

This Air Quality & Greenhouse Gas Impact Assessment has been prepared for the purpose of identifying potential air quality impacts that may result from the proposed Fairmead Wastewater System Improvements Project, hereinafter called “Project”. The Project would abandon the septic tanks and leach fields in Fairmead, and direct wastewater flows through a new sewer trunk line to the City of Chowchilla’s Wastewater Treatment Facility (WWTF). The Project includes a collection system, pump station, force main and gravity main with wastewater treatment and disposal at the existing City of Chowchilla WWTF. The Project will include the following components:

- ✓ Fairmead Gravity Collection System and Lift Station
  - Abandoning of the existing septic tanks and leach fields in Fairmead and direct wastewater flows into a new sewer collection system within Fairmead.
  - The new sewer collection system will drain to a centrally located pump lift station in 4-in to 10-in diameter sewer pipes, with 4-ft or 5-ft diameter manholes spaced at least every 500-ft. Gravity sewer trenches will be 1.5-ft to 3-ft wide and vary from 3-ft to 20-ft deep.
  - The sewer lift station will be centrally located in Fairmead, 20-ft to 25-ft deep, with appurtenances to include a standby generator, an earthen emergency basin, an odor control scrubber, and a small building to house electrical panels, all on a one-acre site.
- ✓ Force Main and Gravity Sewer Line
  - The proposed lift station will discharge effluent to a force main that will consist of one to two 4-in to 8-in diameter pipes approximately 2.5 miles long from the Community of Fairmead to Avenue 24 on the west side of Highway 99, inside the City of Chowchilla. The City’s existing 18-in gravity sewer main will be extended south along Road 16 and then east along Avenue 24 and will terminate on the west side of Highway 99 for a distance of 2.2 miles where it will connect to the new force main.
  - Both the force main and gravity main will be installed in the roadway and roadway shoulders. The total length of both the gravity line and the force main segment will be 4.7 miles.
- ✓ Wastewater Treatment Facility Improvements
  - A 0.9 MGD package treatment plant will be constructed to accommodate service to Fairmead.
  - An additional bar screen will be installed to lessen the burden on the existing structure and allow Public Works staff to take one offline for cleaning and maintenance, thus increasing solids removal earlier in the process and improving the quality of water passed to the next stage of treatment.

Madera County is located in one of the most polluted air basins in the country – the San Joaquin Valley Air Basin (SJVAB). The surrounding topography includes foothills and mountains to the

east and west. These mountain ranges direct air circulation and dispersion patterns. Temperature inversions can trap air within the Valley, thereby preventing the vertical dispersal of air pollutants. In addition to topographic conditions, the local climate can also contribute to air quality problems. Climate in Madera County is classified as Mediterranean, with moist cool winters and dry warm summers.

Air quality within the Project area is addressed through the efforts of various federal, state, regional, and local government agencies. These agencies work jointly, as well as individually, to improve air quality through legislation, regulations, planning, policy-making, education, and a variety of programs.

## IMPACTS

### Short-Term (Construction) Emissions

Short-term impacts are mainly related to the construction phase of a project and are recognized to be short in duration. Construction air quality impacts are generally attributable to dust and exhaust pollutants generated by equipment and vehicles. Fugitive dust is emitted both during construction activity and as a result of wind erosion over exposed earth surfaces. Clearing and earth moving activities do comprise major sources of construction dust emissions, but traffic and general disturbances of soil surfaces also generate significant dust emissions. Further, dust generation is dependent on soil type and soil moisture. Exhaust pollutants are the non-useable gaseous waste products produced during the combustion process. Engine exhaust contains CO, HC, and NO<sub>x</sub> pollutants which are harmful to the environment.

Adverse effects of construction activities cause increased dust-fall and locally elevated levels of total suspended particulate. Dust-fall can be a nuisance to neighboring properties or previously completed developments surrounding or within the Project area and may require frequent washing during the construction period.

PM<sub>10</sub> emissions can result from construction activities of the project. The SJVAPCD requires implementation of effective and comprehensive control measures, rather than a detailed quantification of emissions. The SJVAPCD has determined that compliance with Regulation VIII for all sites and other control measures will constitute sufficient mitigation to reduce PM<sub>10</sub> impacts to a level considered less-than significant.

Ozone precursor emissions are also an impact of construction activities and can be quantified through calculations. Numerous variables factored into estimating total construction emission include: level of activity, length of construction period, number of pieces and types of equipment in use, site characteristics, weather conditions, number of construction personnel, and amount of materials to be transported onsite or offsite. Additional exhaust emissions would be associated with the transport of workers and materials. Because the specific mix of construction

equipment is not presently known for this project, construction emissions from equipment were estimated using the Road Construction Emissions Model.

Table E-1 shows the Road Construction Emissions Model-estimated construction emissions that would be generated from construction of the Project. Results of the analysis show that emissions generated from construction of the Project will be less than the applicable SJVAPCD emission thresholds for criteria pollutants.

**Table E-1**  
**Project Construction Emissions (tons/year)**

Summary Report	CO	NO <sub>x</sub>	ROG	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2e</sub>
Project Site Construction Emissions Per Year	2.67	2.32	0.28	0.01	0.19	0.13	482.36
SJVAPCD Level of Significance	100	10	10	27	15	15	None
Does the Project Exceed Standard?	No	No	No	No	No	No	No

Source: Road Construction Emissions Model

### ✓ Green House Gas Emissions

In the event that a local air district's guidance for addressing GHG impacts does not use numerical GHG emissions thresholds, at the lead agency's discretion, a neighboring air district's GHG thresholds may be used to determine impacts. On December 5, 2008, the South Coast Air Quality Management District (SCAQMD) Governing Board adopted the staff proposal for an interim GHG significance threshold for projects where the SCAQMD is lead agency. The SCAQMD guidance identifies a threshold of 10,000 MTCO<sub>2</sub>eq./year for GHG for construction emissions amortized over a 30-year project lifetime, plus annual operation emissions. This threshold is often used by agencies, such as the California Public Utilities Commission, to evaluate GHG impacts in areas that do not have specific thresholds (CPUC 2015). Therefore, because this threshold has been established by the SCAQMD in an effort to control GHG emissions in the largest metropolitan area in the State of California, this threshold is considered a conservative approach for evaluating the significance of GHG emissions in a more rural area, such as Madera County. Though the Project is under SJVAPCD jurisdiction, the SCAQMD GHG threshold provides some perspective on the GHG emissions generated by the Project. The Project will not generate operational emissions as noted above. However, in accordance with SCAQMD guidance, the Project's construction emissions were amortized over 30-years and compared to the 10,000 MTCO<sub>2</sub>eq./year criteria. Table E-1 shows GHG emissions associated with the construction phase of the Project. Construction emissions associated with the Project amortized over 30-years equates to 16.08 MTCO<sub>2</sub>eq, which is approximately 99.8% less than the threshold identified by the SCAQMD.

### Long-Term Emissions

Long-Term emissions from a project are generated primarily by mobile source (vehicle) emissions



from a project's site and area sources such as maintenance equipment. It should be noted that the Project will not generate emissions associated with long-term emissions given the nature of the Project. All operations associated with the Project will cease upon completion of the repairs (construction) associated with the Fairmead Wastewater System Improvements Project. Therefore, operational emissions from the Project will be less than the applicable SJVAPCD emission thresholds for criteria pollutants.

#### National Environmental Policy Act (NEPA)

NEPA provides general information on the effects of federally funded projects. The Act was implemented by regulations included in the Code of Federal Regulations (40CFR6). The regulations require that projects requiring NEPA review seek to avoid or minimize adverse effects of proposed actions and to restore and enhance environmental quality as much as possible. As noted in Section 3.2 and 3.3 above, emissions generated from construction of the Project will not exceed the SJVAPCD emission thresholds. All operations associated with the Project will cease upon completion of the repairs (construction) associated with the Fairmead Wastewater System Improvements Project.

According to NEPA Guidance, project's which meet the definition contained in 40 CFR 1508.4 (Categorical Exclusion) do not require any further NEPA approvals by the Federal Highway Administration since they do not individually or cumulatively have a significant effect on the environment. FHWA Guidance indicates that the following projects meet the categorical exclusion requirements. As a result, the proposed Project will not individually or cumulatively have a significant effect on the environment.

- ✓ Infrastructure to support utility systems such as wastewater facilities.
- ✓ Alteration of and additions to existing buildings, facilities, and equipment to conform or provide conforming use specifically required by new or existing applicable legislation or regulations.
- ✓ Repair, replacement, upgrading, rebuilding, or minor relocation of pipelines within existing rights-of-way, provided that the actions are in accordance with applicable requirements.
- ✓ Construction and subsequent operation of short (generally less than 20 miles in length) pipeline segments conveying materials between existing source facilities and existing receiving facilities, provided that the pipeline segments are within previously disturbed or developed rights-of-way.

## CEQA ENVIRONMENTAL CHECKLIST

### 1. Air Quality

The following thresholds of significance are based on Appendix G of the CEQA Guidelines. The significance criteria established by the SJVAPCD is relied upon to make the following determinations. Would the project:

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

The primary way of determining consistency with the air quality plan's (AQP's) assumptions is determining consistency with the applicable General Plan to ensure that the Project's population density and land use are consistent with the growth assumptions used in the AQPs for the air basin.

As required by California law, city and county General Plans contain a Land Use Element that details the types and quantities of land uses that the city or county estimates will be needed for future growth, and that designate locations for land uses to regulate growth. MCTC uses the growth projections and land use information in adopted general plans to estimate future average daily trips and then VMT, which are then provided to SJVAPCD to estimate future emissions in the AQPs. Existing and future pollutant emissions computed in the AQP are based on land uses from area general plans. AQPs detail the control measures and emission reductions required for reaching attainment of the air standards.

The applicable General Plan for the project is the Madera County and City of Chowchilla General Plans, which were adopted in 1995 and 2011, respectively. The Project is consistent with the currently adopted General Plans and is therefore consistent with the population growth and VMT applied in the plan. Therefore, the Project is consistent with the growth assumptions used in the applicable AQPs. As a result, the Project will not conflict with or obstruct implementation of any air quality plans. Therefore, no mitigation is needed.

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

The Madera County area is nonattainment for Federal and State air quality standards for ozone, in attainment of Federal standards and nonattainment for State standards for PM<sub>10</sub>, and nonattainment for Federal and State standards for PM<sub>2.5</sub>. The SJVAPCD has prepared the 2016 and 2013 Ozone Plans, 2007 PM<sub>10</sub> Maintenance Plan, and 2012 PM<sub>2.5</sub> Plan to achieve Federal and State standards for improved air quality in the SJVAB regarding ozone and PM. Inconsistency with any of the plans would be considered a cumulatively adverse air quality impact. As discussed in Section 4.1.1, the Project is consistent with the currently adopted General Plans and is therefore consistent with the population growth and VMT applied in the plan. Therefore, the

Project is consistent with the growth assumptions used in the 2016 and 2013 Ozone Plan, 2007 PM10 Maintenance Plan, and 2012 PM2.5 Plan.

Project specific emissions that exceed the thresholds of significance for criteria pollutants would be expected to result in a cumulatively considerable net increase of any criteria pollutant for which the County is in non-attainment under applicable federal or state ambient air quality standards. It should be noted that a project isn't characterized as cumulatively insignificant when project emissions fall below thresholds of significance. As discussed in Section 3.1, the SJVAPCD has established thresholds of significance for determining environmental significance which are provided in Table 6.

#### Air Quality Plan

The SJVAPCD has prepared the 2016 and 2013 Ozone Plans, 2007 PM10 Maintenance Plan, and 2012 PM2.5 Plan to achieve Federal and State standards for improved air quality in the SJVAB regarding ozone and PM. Existing and future pollutant emissions computed in the AQP are based on land uses from area general plans. The AQP details the control measures and emission reductions required for reaching attainment of the air standards.

The applicable General Plan for the project are the Madera County and City of Chowchilla General Plans, which were adopted in 1995 and 2011, respectively. The Project is consistent with the currently adopted General Plans for the Fairmead Community and is therefore consistent with the population growth and VMT applied in the plan. Therefore, the Project is consistent with the growth assumptions used in the applicable AQP. As a result, the Project will not conflict with or obstruct implementation of any air quality plans.

#### Ozone/Particulate Matter

As discussed above, Project emissions would not exceed the project-level significance thresholds for ozone precursors ROG and NOx or PM10 and PM2.5 during construction and operation. The SJVAPCD considers projects that exceed the project-level thresholds of significance as cumulatively significant. The Project's emissions would not combine with other sources in the SJVAB to make a cumulatively considerable contribution to a violation of the ozone standards. Therefore, this impact is less than significant. As such, there would not be a significant contribution to health effects from ozone and particulate matter.

Based on the assessment above, the Project will not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors) and any impacts would be less than significant.

✓ Expose sensitive receptors to substantial pollutant concentrations?

Sensitive receptors refer to those segments of the population 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 that have the greatest potential to attract these types of sensitive receptors include schools, parks, playgrounds, daycare centers, nursing homes, hospitals, and residential communities.

The first step in evaluating the potential for impacts to sensitive receptors for TAC's from the Project is to perform a screening level analysis. For Type A Projects, one type of screening tool is found in the CARB Handbook: Air Quality and Land Use Handbook: A Community Perspective. This handbook includes a table (depicted in Table 4) with recommended buffer distances associated with various types of common sources. Since, the Project does not correspond with the characteristics of the source categories included in Table 4, a health risk assessment is not needed at this time. Therefore, the Project will not expose sensitive receptors to substantial pollutant concentrations and any impacts would be less than significant.

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

The intensity of an odor source's operations and its proximity to sensitive receptors influences the potential significance of odor emissions. The SJVAPCD has identified some common types of facilities that have been known to produce odors in the SJV Air Basin. The types of facilities that are known to produce odors are shown in Table 5 above along with a reasonable distance from the source within which, the degree of odors could possibly be significant. The Project corresponds with specific characteristics (projects) identified in Table 5. The Project seeks to abandon the septic tanks and leach fields in Fairmead and direct wastewater flows through a new sewer trunk line to the existing City of Chowchilla's WWTF. The Project does not consist of the siting of 'new' wastewater treatment facilities, but rather the improvement of Fairmead facility components. As a result, the Project will not result in other emissions adversely affecting a substantial number of people.

## 2. Greenhouse Gas Emissions

The following thresholds of significance are based on Appendix G of the CEQA Guidelines. The significance criteria established by the SJVAPCD is relied upon to make the following determinations. Would the project:

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

In the event that a local air district's guidance for addressing GHG impacts does not use numerical GHG emissions thresholds, at the lead agency's discretion, a neighboring air district's GHG thresholds may be used to determine impacts. On December 5, 2008, the South Coast Air Quality

Management District (SCAQMD) Governing Board adopted the staff proposal for an interim GHG significance threshold for projects where the SCAQMD is lead agency. The SCAQMD guidance identifies a threshold of 10,000 MTCO<sub>2</sub>eq./year for GHG for construction emissions amortized over a 30-year project lifetime, plus annual operation emissions. This threshold is often used by agencies, such as the California Public Utilities Commission, to evaluate GHG impacts in areas that do not have specific thresholds (CPUC 2015). Therefore, because this threshold has been established by the SCAQMD in an effort to control GHG emissions in the largest metropolitan area in the State of California, this threshold is considered a conservative approach for evaluating the significance of GHG emissions in a more rural area, such as Madera County. Though the Project is under SJVAPCD jurisdiction, the SCAQMD GHG threshold provides some perspective on the GHG emissions generated by the Project. The Project will not generate operational emissions as noted above. However, in accordance with SCAQMD guidance, the Project's construction emissions were amortized over 30-years and compared to the 10,000 MTCO<sub>2</sub>eq./year criteria. Table E-1 shows GHG emissions associated with the construction phase of the Project. Construction emissions associated with the Project amortized over 30-years equates to 16.08 MTCO<sub>2</sub>eq, which is approximately 99.8% less than the threshold identified by the SCAQMD.

Based on the assessment above, the Project will not generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment. Therefore, any impacts would be less than significant.

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

As required by California law, city and county General Plans contain a Land Use Element that details the types and quantities of land uses that the city or county estimates will be needed for future growth, and that designate locations for land uses to regulate growth. MCTC uses the growth projections and land use information in adopted general plans to estimate future average daily trips and then VMT, which are then provided to SJVAPCD to estimate future emissions in the AQPs. The applicable General Plan for the project is the Madera County and City of Chowchilla General Plans, which were adopted in 1995 and 2011, respectively.

The Project is consistent with the currently adopted General Plan for Madera County and the City of Chowchilla and the adopted 2018 RTP/SCS and is therefore consistent with the population growth and VMT applied in those plan documents. Therefore, the Project is consistent with the growth assumptions used in the applicable AQP. It should also be noted that yearly GHG emissions generated by the Project are approximately 99.8% less than the threshold identified by the SCAQMD (see the discussion for Impact 4.2.1 above).

Based on the assessment above, the Project will not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases. The Project further the achievement of the County's greenhouse gas reduction goals. Therefore, any impacts would be less than significant.

## 1.0 /Introduction

### 1.1 Description of the Region/Project

Fairmead is a small, rural community located southeast of the State Route (SR) 99/SR 152 interchange in unincorporated Madera County. Located roughly in the center of the San Joaquin Valley, Fairmead lies between the cities of Chowchilla to the north and Madera to the south. The Community includes a small core of compact streets and blocks located east of SR 99 and the Union Pacific (formerly Southern Pacific) railroad along Fairmead Boulevard. The City of Chowchilla's Wastewater Treatment Facility, 15750 Avenue 24 ½ in Chowchilla, CA, is located at the northern most end of the proposed Project. Figures 1 and 2 show the location of the Project and the surrounding roadway network.

Properties within Fairmead rely on individual septic systems for sewer service. Wastewater in the Community is disposed of through the use of onsite septic tanks and leach fields or pits. There is no sanitary sewer collection system or wastewater treatment facility in the Community, or immediately adjacent to it. Potential for contamination of groundwater supplies has caused the State and County to request that the City of Chowchilla consider connecting Fairmead to the City's existing wastewater treatment plant. This would require construction of a sewer collection system and transmission line from Fairmead to Chowchilla.

The Project would abandon the septic tanks and leach fields in Fairmead, and direct wastewater flows through a new sewer trunk line to the City of Chowchilla's Wastewater Treatment Facility (WWTF) (Project). Approximately 175 residential connections, the Fairmead Elementary School, and a commercial property will be connected to the City of Chowchilla's WWTF. The Project includes a collection system, pump station, force main and gravity main with wastewater treatment and disposal at the existing City of Chowchilla WWTF. The Project will include the following components:

- ✓ Fairmead Gravity Collection System and Lift Station
  - Abandoning of the existing septic tanks and leach fields in Fairmead and direct wastewater flows into a new sewer collection system within Fairmead.
  - The new sewer collection system will drain to a centrally located pump lift station in 4-in to 10-in diameter sewer pipes, with 4-ft or 5-ft diameter manholes spaced at least every 500-ft. Gravity sewer trenches will be 1.5-ft to 3-ft wide and vary from 3-ft to 20-ft deep.
  - The sewer lift station will be centrally located in Fairmead, 20-ft to 25-ft deep, with appurtenances to include a standby generator, an earthen emergency basin, an odor control scrubber, and a small building to house electrical panels, all on a one-acre site.
- ✓ Force Main and Gravity Sewer Line
  - The proposed lift station will discharge effluent to a force main that will consist of one to two 4-in to 8-in diameter pipes approximately 2.5 miles long from the Community of

Fairmead to Avenue 24 on the west side of Highway 99, inside the City of Chowchilla. The City's existing 18-in gravity sewer main will be extended south along Road 16 and then east along Avenue 24 and will terminate on the west side of Highway 99 for a distance of 2.2 miles where it will connect to the new force main.

- Both the force main and gravity main will be installed in the roadway and roadway shoulders. The total length of both the gravity line and the force main segment will be 4.7 miles.

✓ Wastewater Treatment Facility Improvements

- A 0.9 MGD package treatment plant will be constructed to accommodate service to Fairmead.
- An additional bar screen will be installed to lessen the burden on the existing structure and allow Public Works staff to take one offline for cleaning and maintenance, thus increasing solids removal earlier in the process and improving the quality of water passed to the next stage of treatment.

Madera County is located in one of the most polluted air basins in the country – the San Joaquin Valley Air Basin (SJVAB). The surrounding topography includes foothills and mountains to the east and west. These mountain ranges direct air circulation and dispersion patterns. Temperature inversions can trap air within the Valley, thereby preventing the vertical dispersal of air pollutants. In addition to topographic conditions, the local climate can also contribute to air quality problems. Climate in Madera County is classified as Mediterranean, with moist cool winters and dry warm summers.

## 1.2 Regulatory

Air quality within the Project area is addressed through the efforts of various federal, state, regional, and local government agencies. These agencies work jointly, as well as individually, to improve air quality through legislation, regulations, planning, policy-making, education, and a variety of programs. The agencies primarily responsible for improving the air quality within Madera County are discussed below along with their individual responsibilities.

### 1.2.1 Federal Agencies

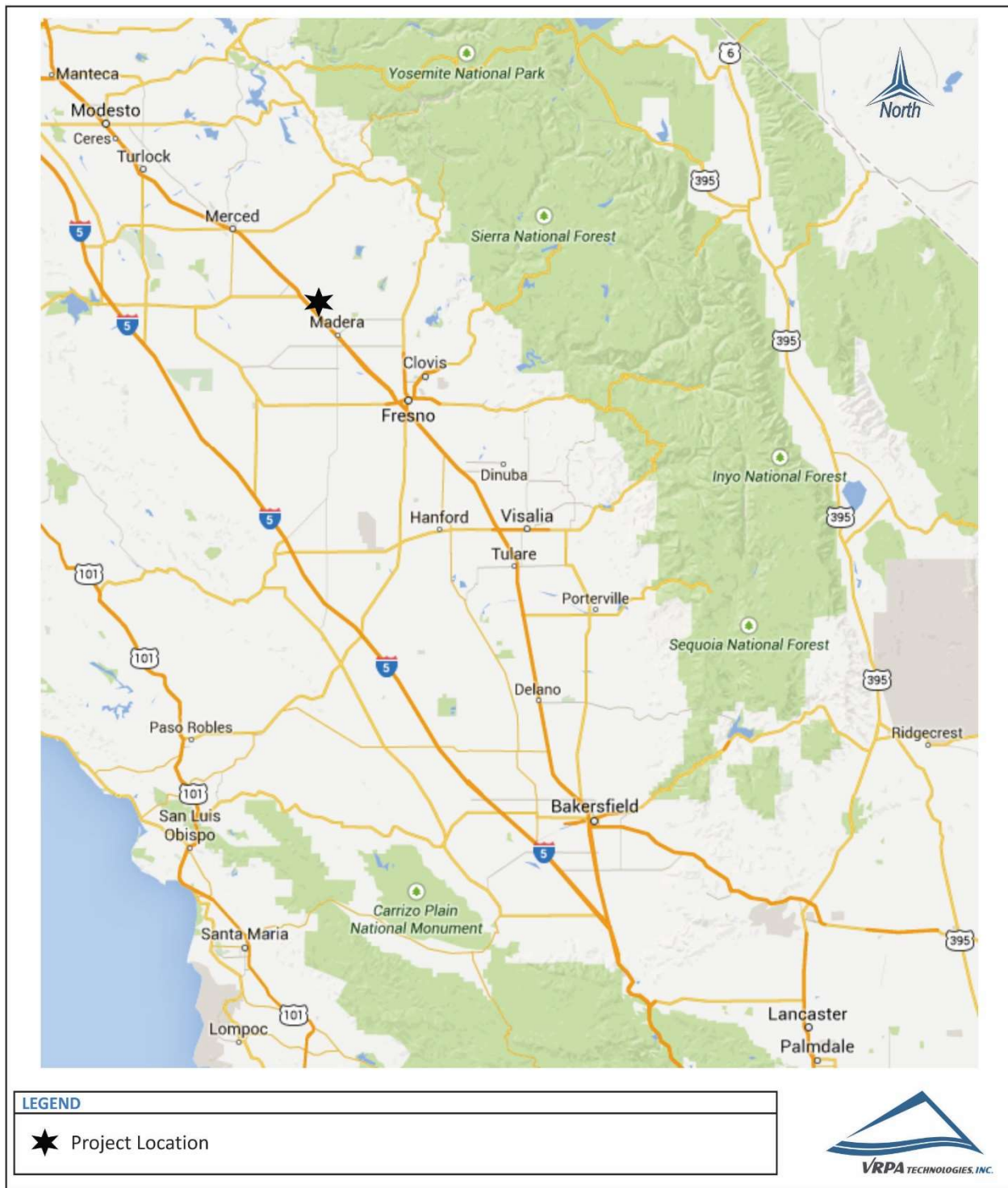
✓ **U.S. Environmental Protection Agency (EPA)**

The Federal Clean Air Bill first adopted in 1967 and periodically amended since then, established federal ambient air quality standards. A 1987 amendment to the Bill set a deadline for the attainment of these standards. That deadline has since passed. The other federal Clean Air Bill Amendments, passed in 1990, share responsibility with the State in reducing emissions from mobile sources. The U.S. Environmental Protection Agency (EPA) is responsible for enforcing the 1990 amendments.



**Fairmead Wastewater System Improvements Project**  
**Regional Location**

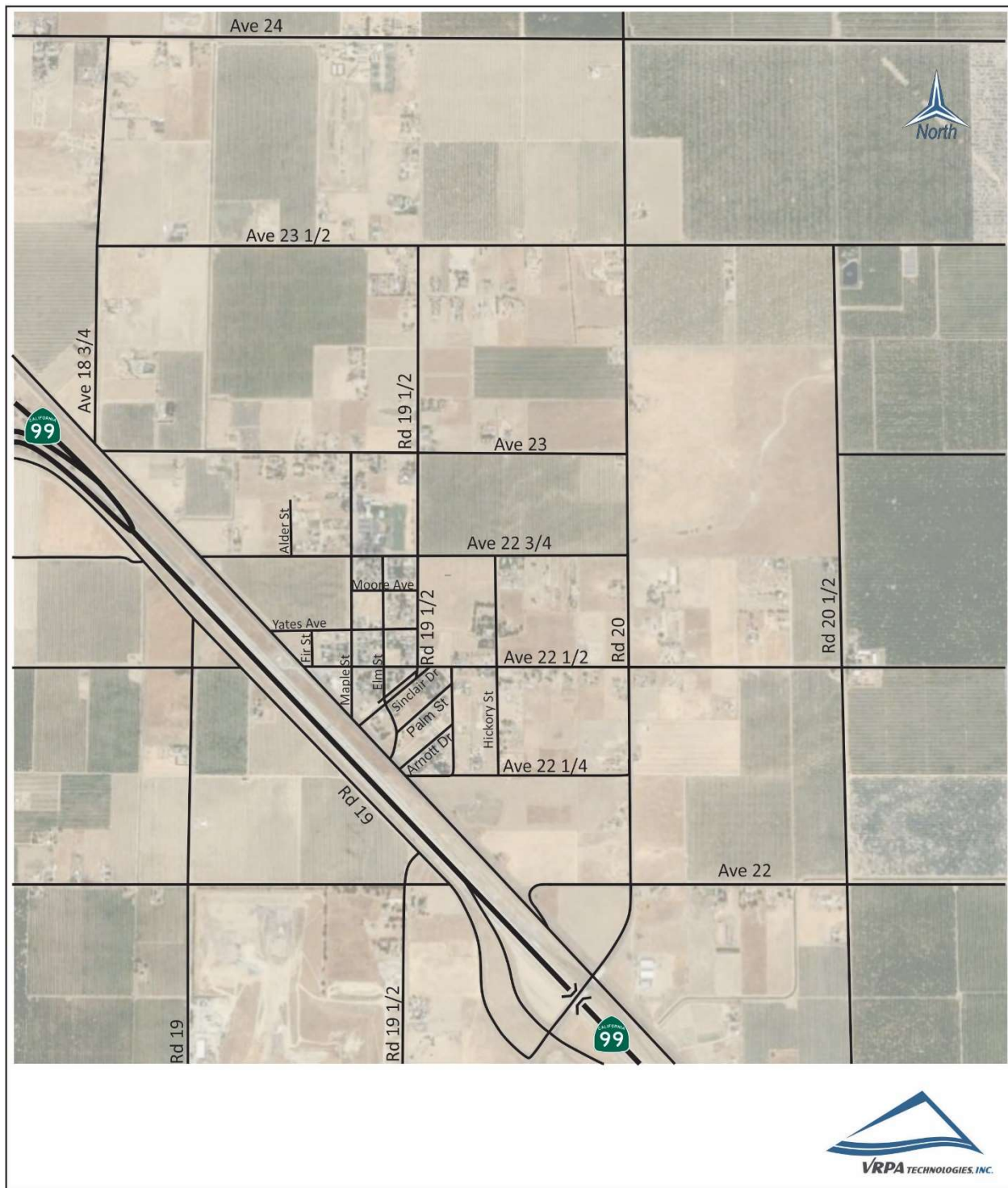
**Figure**  
**1**





**Fairmead Wastewater System Improvements Project**  
**Fairmead Community**

**Figure**  
**2**



The Federal Clean Air Act (FCAA) and the national ambient air quality standards identify levels of air quality for six “criteria” pollutants, which are considered the maximum levels of ambient air pollutants considered safe, with an adequate margin of safety, to protect public health and welfare. The six criteria pollutants include ozone, carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), particulate matter (PM), and lead (Pb).

The Clean Air Act Section 176(c) (42 U.S.C. 7506(c)) and EPA transportation conformity regulations (40 CFR 93 Subpart A) require that each new Regional Transportation Plan (RTP) and Transportation Improvement Program (TIP) be demonstrated to conform to the State Implementation Plan (SIP) before the RTP and TIP are approved by the MPO or accepted by the U.S. Department of Transportation (DOT). The conformity analysis is a federal requirement designed to demonstrate compliance with the national ambient air quality standards. However, because the San Joaquin Valley State Implementation Plan (SIP) for CO, PM<sub>10</sub>, PM<sub>2.5</sub> and Ozone address attainment of both the state and federal standards, for these pollutants, demonstrating conformity to the federal standards is also an indication of progress toward attainment of the state standards. Compliance with the state air quality standards is provided on the pages following this federal conformity discussion.

The EPA approved San Joaquin Valley reclassification of the ozone (8-hour) designation to extreme nonattainment in the Federal Register on May 5, 2010, even though the San Joaquin Valley was initially classified as serious nonattainment for the 1997 8-hour ozone standard. In accordance with the FCAA, EPA uses the design value at the time of standard promulgation to assign nonattainment areas to one of several classes that reflect the severity of the nonattainment problem; classifications range from marginal nonattainment to extreme nonattainment. In the Federal Register on October 26, 2015, the EPA revised the primary and secondary standard to 0.070 ppm to provide increased public health protection against health effects associated with long- and short-term exposures. The previous ozone standard was set in 2010 at 0.075ppm.

### 1.2.2 *Federal Regulations*

#### ✓ **National Environmental Policy Act (NEPA)**

The National Environmental Policy Act (NEPA) provides general information on the effects of federally funded projects. The act was implemented by regulations included in the Code of Federal Regulations (40CFR6). The code requires careful consideration concerning environmental impacts of federal actions or plans, including projects that receive federal funds. The regulations address impacts on land uses and conflicts with state, regional, or local plans and policies, among others. They also require that projects requiring NEPA review seek to avoid or minimize adverse effects of proposed actions and to restore and enhance environmental quality as much as possible. The Project is subject to NEPA compliance because of the potential for Federal grant funding for construction of the Project. The air quality assessment required under Federal air quality standards and regulations covers the basic outline for project-level assessment under NEPA guidelines. The FCAA also requires a

parallel “Conformity” in addition to the basic impact assessment.

### 1.2.3 State Agencies

#### ✓ California Air Resources Board (CARB)

The California Air Resources Board (CARB) is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing its own air quality legislation called the California Clean Air Act (CCAA), adopted in 1988. The CARB was created in 1967 from the merging of the California Motor Vehicle Pollution Control Board and the Bureau of Air Sanitation and its Laboratory.

The CARB has primary responsibility in California to develop and implement air pollution control plans designed to achieve and maintain the National Ambient Air Quality Standards (NAAQS) established by the EPA. Whereas the CARB has primary responsibility and produces a major part of the SIP for pollution sources that are statewide in scope, it relies on the local air districts to provide additional strategies for sources under their jurisdiction. The CARB combines its data with all local district data and submits the completed SIP to the EPA. The SIP consists of the emissions standards for vehicular sources and consumer products set by the CARB, and attainment plans adopted by the Air Pollution Control Districts (APCDs) and Air Quality Management District’s (AQMDs) and approved by the CARB.

States may establish their own standards, provided the state standards are at least as stringent as the NAAQS. California has established California Ambient Air Quality Standards (CAAQS) pursuant to California Health and Safety Code (CH&SC) [§39606(b)] and its predecessor statutes.

The CH&SC [§39608] requires the CARB to “identify” and “classify” each air basin in the state on a pollutant-by-pollutant basis. Subsequently, the CARB designated areas in California as nonattainment based on violations of the CAAQSs. Designations and classifications specific to the SJVAB can be found in the next section of this document. Areas in the state were also classified based on severity of air pollution problems. For each nonattainment class, the CCAA specifies air quality management strategies that must be adopted. For all nonattainment categories, attainment plans are required to demonstrate a five-percent-per-year reduction in nonattainment air pollutants or their precursors, averaged every consecutive three-year period, unless an approved alternative measure of progress is developed. In addition, air districts in violation of CAAQS are required to prepare an Air Quality Attainment Plan (AQAP) that lays out a program to attain and maintain the CCAA mandates.

Other CARB duties include monitoring air quality. The CARB has established and maintains, in conjunction with local APCDs and air quality management districts, a network of sampling stations (called the State and Local Air Monitoring [SLAMS] network), which monitor the present pollutant levels in the ambient air.

Madera County is in the CARB-designated, SJVAB. A map of the SJVAB is provided in Figure 3. In addition to Madera County, the SJVAB includes Fresno, Kern, Kings, Merced, San Joaquin, Stanislaus, and Tulare Counties.

Federal and State standards for criteria pollutants are provided in Table 1.

#### 1.2.4 State Regulations

##### ✓ CARB Mobile-Source Regulation

The State of California Air Pollution Control Board is responsible for controlling emissions from the operation of motor vehicles in the state. Rather than mandating the use of specific technology or the reliance on a specific fuel, the CARB's motor vehicle standards specify the allowable grams of pollution per mile driven. In other words, the regulations focus on the reductions needed rather than on the manner in which they are achieved. Towards this end, the CARB has adopted regulations, which required auto manufacturers to phase in less polluting vehicles.

##### ✓ California Clean Air Act

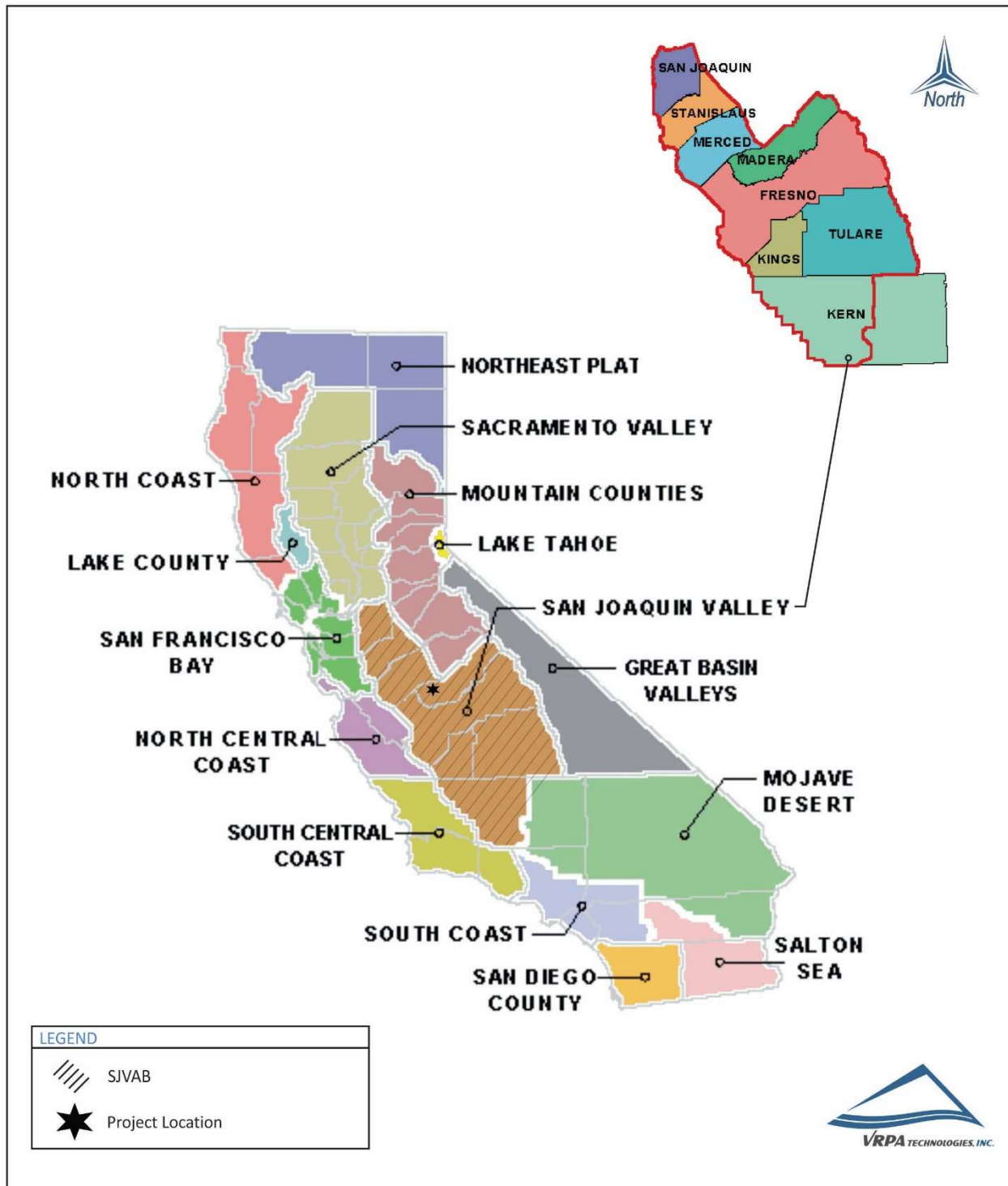
The CCAA was first signed into law in 1988. The CCAA provides a comprehensive framework for air quality planning and regulation, and spells out, in statute, the state's air quality goals, planning and regulatory strategies, and performance. The CCAA establishes more stringent ambient air quality standards than those included in the FCAA. The CARB is the agency responsible for administering the CCAA. The CARB established ambient air quality standards pursuant to the CH&SC [§39606(b)], which are similar to the federal standards. The San Joaquin Valley Air Pollution Control District (SJVAPCD) is one of 35 air quality management districts that have prepared air quality management plans to accomplish a five percent annual reduction in emissions documenting progress toward the state ambient air quality standards.

##### ✓ California Environmental Quality Act (CEQA)

CEQA defines a significant impact on the environment as a substantial, or potentially substantial, adverse change in the physical conditions within the area affected by the project. Land use is a required impact assessment category under CEQA. CEQA documents generally evaluate land use in terms of compatibility with the existing land uses and consistency with local general plans and other local land use controls (zoning, specific plans, etc.).

**Fairmead Wastewater System Improvements Project**  
**San Joaquin Valley Air Basin**

**Figure**  
**3**





**Table 1**  
**Ambient Air Quality Standards**

Pollutant	Averaging Time	California Standards <sup>1</sup>		National Standards <sup>2</sup>		
		Concentration <sup>3</sup>	Method <sup>4</sup>	Primary <sup>3,5</sup>	Secondary <sup>3,6</sup>	Method <sup>7</sup>
Ozone (O <sub>3</sub> ) <sup>8</sup>	1 Hour	0.09 ppm (180 µg/m <sup>3</sup> )	Ultraviolet Photometry	--	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m <sup>3</sup> )		0.070 ppm (137 µg/m <sup>3</sup> )		
Respirable Particulate Matter (PM10) <sup>9</sup>	24 Hour	50 µg/m <sup>3</sup>	Gravimetric or Beta Attenuation	150 µg/m <sup>3</sup>	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m <sup>3</sup>		--		
Fine Particulate Matter (PM2.5) <sup>9</sup>	24 Hour	--	--	35 µg/m <sup>3</sup>	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m <sup>3</sup>	Gravimetric or Beta Attenuation	12.0 µg/m <sup>3</sup>	15 µg/m <sup>3</sup>	
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m <sup>3</sup> )	Non-Dispersive Infrared Photometry (NDIR)	35 ppm (40 mg/m <sup>3</sup> )	--	Non-Dispersive Infrared Photometry (NDIR)
	8 Hour	9.0 ppm (10 mg/m <sup>3</sup> )		9 ppm (10 mg/m <sup>3</sup> )	--	
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m <sup>3</sup> )		--	--	
Nitrogen Dioxide (NO <sub>2</sub> ) <sup>10</sup>	1 Hour	0.18 ppm (339 µg/m <sup>3</sup> )	Gas Phase Chemiluminescence	100 ppb (188 µg/m <sup>3</sup> )	--	Gas Phase Chemiluminescence
	Annual Arithmetic Mean	0.030 ppm (57 µg/m <sup>3</sup> )		0.053 ppm (100 µg/m <sup>3</sup> )	Same as Primary Standard	
Sulfur Dioxide (SO <sub>2</sub> ) <sup>11</sup>	1 Hour	0.25 ppm (655 µg/m <sup>3</sup> )	Ultraviolet Fluorescence	75 ppb (196 µg/m <sup>3</sup> )	--	Ultraviolet Fluorescence; Spectrophotometry (Pararosaniline Method)
	3 Hour	--		--	0.5 ppm (1300 µg/m <sup>3</sup> )	
	24 Hour	0.04 ppm (105 µg/m <sup>3</sup> )		0.14 ppm (for cetain areas) <sup>11</sup>	--	
	Annual Arithmetic Mean	--		0.030 ppm (for cetain areas) <sup>11</sup>	--	
Lead <sup>12,13</sup>	30 Day Average	1.5 µg/m <sup>3</sup>	Atomic Absorption	--	--	High Volume Sampler and Atomic Absorption
	Calendar Quarter	--		1.5 µg/m <sup>3</sup> (for certain areas) <sup>11</sup>	Same as Primary Standard	
	Rolling 3-Month Average	--		0.15 µg/m <sup>3</sup>		
Visibility Reducing Particles <sup>14</sup>	8 Hour	See footnote 14	Beta Attenuation and Transmittance through Filter Tape	No National Standards		
Sulfates	24 Hour	25 µg/m <sup>3</sup>	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m <sup>3</sup> )	Ultraviolet Fluorescence			
Vinyl Chloride <sup>12</sup>	24 Hour	0.01 ppm (26 µg/m <sup>3</sup> )	Gas Chromatography			

See footnotes on next page ...

**Footnotes:**

1. California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM<sub>10</sub>, PM<sub>2.5</sub>, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
2. National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM<sub>10</sub>, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m<sup>3</sup> is equal to or less than one. For PM<sub>2.5</sub>, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the U.S. EPA for further clarification and current national policies.
3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
4. Any equivalent measurement method which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.
5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
7. Reference method as described by the U.S. EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the U.S. EPA.
8. On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.
9. On December 14, 2012, the national annual PM<sub>2.5</sub> primary standard was lowered from 15 µg/m<sup>3</sup> to 12.0 µg/m<sup>3</sup>. The existing national 24-hour PM<sub>2.5</sub> standards (primary and secondary) were retained at 35 µg/m<sup>3</sup>, as was the annual secondary standard of 15 µg/m<sup>3</sup>. The existing 24-hour PM<sub>10</sub> standards (primary and secondary) of 150 µg/m<sup>3</sup> also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.
10. To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.
11. On June 2, 2010, a new 1-hour SO<sub>2</sub> standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO<sub>2</sub> national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.  
  
Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.
12. The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
13. The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 µg/m<sup>3</sup> as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.
14. In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

✓ **Tanner Air Toxics Act**

California regulates Toxic Air Contaminants (TAC) primarily through the Tanner Air Toxics Act (AB 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). The Tanner Act sets forth a formal procedure for CARB to designate substances as TAC. This includes research, public participation, and scientific peer review before CARB can designate a substance as a TAC. To date, CARB has identified more than 21 TAC and has adopted EPA's list of Hazardous Air Pollutants (HAPs) as TAC. Most recently, diesel PM was added to the CARB list of TAC. Once a TAC is identified, CARB then adopts an Airborne Toxics Control Measure (ATCM) for sources that emit that particular TAC. The CARB list of TAC is provided below:

- Benzene
- Ethylene Dibromide
- Ethylene Dichloride
- Hexavalent chromium
- Asbestos
- Dibenzo-p-dioxins and Dibenzofurans
- Cadmium
- Carbon Tetrachloride
- Ethylene Oxide
- Methylene Chloride
- Trichloroethylene
- Chloroform
- Vinyl chloride
- Inorganic Arsenic
- Nickel
- Perchloroethylene
- Formaldehyde
- 1,3-Butadiene
- Inorganic Lead
- Particulate Emissions from Diesel-Fueled Engines
- Environmental Tobacco Smoke
- EPA's Hazardous Air Pollutants (187)

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 Best Available Control Technology (BACT) to minimize emissions.

✓ **Assembly Bill 32 (California Global Warming Solutions Act of 2006)**

California passed the California Global Warming Solutions Act of 2006 (AB 32; California Health and Safety Code Division 25.5, Sections 38500 - 38599). AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and



establishes a cap on statewide GHG emissions. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. This reduction will be accomplished by enforcing a statewide cap on GHG emissions that will be phased in starting in 2012. To effectively implement the cap, AB 32 directs CARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then CARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

AB 32 requires CARB to adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrived at the cap; institute a schedule to meet the emissions cap; and develop tracking, reporting, and enforcement mechanisms to ensure that the state reduces GHG emissions enough to meet the cap. AB 32 also includes guidance on instituting emissions reductions in an economically efficient manner, along with conditions to ensure that businesses and consumers are not unfairly affected by the reductions. Using these criteria to reduce statewide GHG emissions to 1990 levels by 2020 would represent an approximate 25 to 30 percent reduction in current emissions levels. However, CARB has discretionary authority to seek greater reductions in more significant and growing GHG sectors, such as transportation, as compared to other sectors that are not anticipated to significantly increase emissions. Under AB 32, CARB must adopt regulations by January 1, 2011 to achieve reductions in GHGs to meet the 1990 emission cap by 2020.

On December 11, 2008, CARB adopted its initial Scoping Plan, which functions as a roadmap of CARB's plans to achieve GHG reductions in California required by AB 32 through subsequently enacted regulations. CARB's 2017 Climate Change Scoping Plan builds on the efforts and plans encompassed in the initial Scoping Plan. The current plan has identified new policies and actions to accomplish the State's 2030 GHG limit.

#### ✓ **Senate Bill 375**

SB 375, signed in September 2008 (Chapter 728, Statutes of 2008), aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS) that will prescribe land use allocation in that MPO's regional transportation plan. CARB, in consultation with MPOs, has provided each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. For the Madera County Transportation Commission (MCTC) region, CARB set targets at five (5) percent per capita decrease in 2020 and a ten (10) percent per capita decrease in 2035 from a base year of 2005.

This law also extends the minimum time period for the regional housing needs allocation

cycle from five years to eight years for local governments located within an MPO that meets certain requirements. City or county land use policies (including general plans) are not required to be consistent with the regional transportation plan (and associated SCS or APS). However, new provisions of CEQA would incentivize (through streamlining and other provisions) qualified projects that are consistent with an approved SCS or APS, categorized as "transit priority projects."

✓ **Executive Order B-30-15**

Executive Order B-30-15, which was signed by Governor Brown in 2016, establishes a California greenhouse gas reduction target of 40 percent below 1990 levels by 2030 to ensure California meets its target of reducing greenhouse gas emissions to 80 percent below 1990 levels by 2050. Executive Order B-30-15 requires MPO's to implement measures that will achieve reductions of greenhouse gas emissions to meet the 2030 and 2050 greenhouse gas emissions reductions targets.

### 1.2.5 *Regional Agencies*

✓ **San Joaquin Valley Air Pollution Control District**

The SJVAPCD is the agency responsible for monitoring and regulating air pollutant emissions from stationary, area, and indirect sources within Madera County and throughout the SJVAB. The District also has responsibility for monitoring air quality and setting and enforcing limits for source emissions. The CARB is the agency with the legal responsibility for regulating mobile source emissions. The District is precluded from such activities under State law.

The District was formed in mid-1991 and prepared and adopted the San Joaquin Valley Air Quality Attainment Plan (AQAP), dated January 30, 1992, in response to the requirements of the State CCAA. The CCAA requires each non-attainment district to reduce pertinent air contaminants by at least five percent (5%) per year until new, more stringent, 1988 State air quality standards are met.

Activities of the SJVAPCD include the preparation of plans for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations concerning sources of air pollution, issuance of permits for stationary sources of air pollution, inspection of stationary sources of air pollution and response to citizen complaints, monitoring of ambient air quality and meteorological conditions, and implementation of programs and regulations required by the FCAA and CCAA.

The SJVAPCD has prepared the 2016 (8-hour) and 2013 (1-hour) Ozone Plans to achieve Federal and State standards for improved air quality in the SJVAB regarding ozone. The 2016 and 2013 Ozone Plan provides a comprehensive list of regulatory and incentive-based measures to reduce emissions of ozone and particulate matter precursors throughout the

SJVAB. The 2016 and 2013 Ozone Plan calls for major advancements in pollution control technologies for mobile and stationary sources of air pollution. The 2013 Ozone Plan calls for a 75-percent reduction in ozone-forming oxides of nitrogen emissions. The 2013 Ozone Plan also addresses the remaining requirement under the 1979 revoked 1-hour ozone NAAQS.

The SJVAPCD has also prepared the *2007 PM<sub>10</sub> Maintenance Plan and Request for Redesignation* (2007 PM<sub>10</sub> Plan). On April 24, 2006, the SJVAPCD submitted a Request for Determination of PM<sub>10</sub> Attainment for the Basin to the CARB. The CARB concurred with the request and submitted the request to the EPA on May 8, 2006. On October 30, 2006, the EPA issued a Final Rule determining that the Basin had attained the NAAQS for PM<sub>10</sub>. However, the EPA noted that the Final Rule did not constitute a redesignation to attainment until all of the FCAA requirements under Section 107(d)(3) were met.

The SJVAPCD has prepared the *2012 PM<sub>2.5</sub> Plan* to achieve Federal and State standards for improved air quality in the SJVAB. The *2012 PM<sub>2.5</sub> Plan* provides a comprehensive list of regulatory and incentive based measures to reduce PM<sub>2.5</sub>.

In addition to the 2016 and *2013 Ozone Plan*, the *2012 PM<sub>2.5</sub> Plan*, and the *2007 PM<sub>10</sub> Plan*, the SJVAPCD prepared the *Guide for Assessing and Mitigation Air Quality Impacts* (GAMAQI), dated March 19, 2015.

The GAMAQI is an advisory document that provides Lead Agencies, consultants, and project applicants with analysis guidance and uniform procedures for addressing air quality impacts in environmental documents. Local jurisdictions are not required to utilize the methodology outlined therein. This document describes the criteria that SJVAPCD uses when reviewing and commenting on the adequacy of environmental documents. It recommends thresholds for determining whether or not projects would have significant adverse environmental impacts, identifies methodologies for predicting project emissions and impacts, and identifies measures that can be used to avoid or reduce air quality impacts.

The SJVAPCD Plans identified above represent that SJVAPCD's plan to achieve both state and federal air quality standards. The regulations and incentives contained in these documents must be legally enforceable and permanent. These plans break emissions reductions and compliance into different emissions source categories.

### 1.2.6 Regional Regulations

The SJVAPCD has adopted numerous rules and regulations to implement its air quality plans. Following, are significant rules that will apply to the Project.

✓ **Regulation VIII – Fugitive PM<sub>10</sub> Prohibitions**

Regulation VIII is comprised of District Rules 8011 through 8081, which are designed to reduce PM<sub>10</sub> 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, landfill operations, etc. The proposed Project will be required to comply with this regulation. Regulation VIII control measures are provided below:

1. *All disturbed areas, including storage piles, which are not being actively utilized for construction purposes, shall be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, covered with a tarp or other suitable cover or vegetative ground cover.*
2. *All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.*
3. *All land clearing, grubbing, scraping, excavation, land leveling, grading, cut & fill, and demolition activities shall be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking.*
4. *When materials are transported off-site, all material shall be covered, or effectively wetted to limit visible dust emissions, and at least six inches of freeboard space from the top of the container shall be maintained.*
5. *All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of each workday. The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions. Use of blower devices is expressly forbidden.*
6. *Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions utilizing sufficient water or chemical stabilizer/suppressant.*
7. *Within urban areas, track out shall be immediately removed when it extends 50 or more feet from the site and at the end of each workday.*

✓ **Rule 8021 – Construction, Demolition, Excavation, and Other Earthmoving Activities**

District Rule 8021 requires owners or operators of construction projects to submit a Dust Control Plan to the District if at any time the project involves non-residential developments of five or more acres of disturbed surface area or moving, depositing, or relocating of more than 2,500 cubic yards per day of bulk materials on at least three days of the project. The Project will meet these criteria and will be required to submit a Dust Control Plan to the District in order to comply with this rule.

✓ **Rule 4641 – Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations**

If asphalt paving will be used, then paving operations of the proposed project will be subject

to Rule 4641. This rule applies to the manufacture and use of cutback asphalt, slow cure asphalt and emulsified asphalt for paving and maintenance operations.

✓ **Rule 9510 – Indirect Source Review (ISR)**

The purpose of this rule is to fulfill the District’s emission reduction commitments in the PM10 and Ozone Attainment Plans, achieve emission reductions from construction activities, and to provide a mechanism for reducing emissions from the construction of and use of development projects through off-site measures. The Project may be required to comply with this regulation dependent upon the results of the analysis.

**1.2.7 Local Plans**

✓ **Madera County and City of Chowchilla General Plan**

California State Law requires every city and county to adopt a comprehensive General Plan to guide its future development. The General Plan essentially serves as a “constitution for development”— the document that serves as the foundation for all land use decisions. The Madera County and City of Chowchilla General Plans include various elements, including air quality and greenhouse gases, that address local concerns and provides goals and policies to achieve its development goals.

## 2.0 Environmental Setting

This section describes existing air quality within the San Joaquin Valley Air Basin and in Madera County, including the identification of air pollutant standards, meteorological and topological conditions affecting air quality, and current air quality conditions. Air quality is described in relation to ambient air quality standards for criteria pollutants such as, ozone, carbon monoxide, and particulate matter. Air quality can be directly affected by the type and density of land use change and population growth in urban and rural areas.

### 2.1 Geographical Location

The SJVAB is comprised of eight counties: Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare. Encompassing 24,840 square miles, the San Joaquin Valley is the second largest air basin in California. Cumulatively, counties within the Air Basin represent approximately 16 percent of the State's geographic area. The Air Basin is bordered by the Sierra Nevada Mountains on the east (8,000 to 14,492 feet in elevation), the Coastal Range on the west (4,500 feet in elevation), and the Tehachapi Mountains on the south (9,000 feet elevation). The San Joaquin Valley is open to the north extending to the Sacramento Valley Air Basin.

### 2.2 Topographic Conditions

Madera County is located within the San Joaquin Valley Air Basin [as determined by the California Air Resources Board (CARB)]. Air basins are geographic areas sharing a common "air shed." A description of the Air Basin in the County, as designated by CARB, is provided in paragraph below. Air pollution is directly related to the region's topographic features, which impact air movement within the Basin.

Wind patterns within the SJVAB result from marine air that generally flows into the Basin from the San Joaquin River Delta. The Coastal Range hinders wind access into the Valley from the west, the Tehachapi's prevent southerly passage of airflow, and the high Sierra Nevada Mountain Range provides a significant barrier to the east. These topographic features result in weak airflow that becomes restricted vertically by high barometric pressure over the Valley. As a result, the SJVAB is highly susceptible to pollutant accumulation over time. Most of the surrounding mountains are above the normal height of summer inversion layers (1,500-3,000 feet).

### 2.3 Climatic Conditions

Madera County is located in one of the most polluted air basins in the country. Temperature inversions can trap air within the Valley, thereby preventing the vertical dispersal of air pollutants. In addition to topographic conditions, the local climate can also contribute to air quality problems. Climate in Madera County is classified as Mediterranean, with moist cool winters and dry warm summers.

Ozone, classified as a “regional” pollutant, often afflicts areas downwind of the original source of precursor emissions. Ozone can be easily transported by winds from a source area. Peak ozone levels tend to be higher in the southern portion of the Valley, as the prevailing summer winds sweep precursors downwind of northern source areas before concentrations peak. The separate designations reflect the fact that ozone precursor transport depends on daily meteorological conditions.

Other primary pollutants, carbon monoxide (CO), for example, may form high concentrations when wind speed is low. During the winter, Madera County experiences cold temperatures and calm conditions that increase the likelihood of a climate conducive to high CO concentrations.

Precipitation and fog tend to reduce or limit some pollutant concentrations. Ozone needs sunlight for its formation, and clouds and fog block the required radiation. CO is slightly water-soluble, so precipitation and fog tends to “reduce” CO concentrations in the atmosphere. PM10 is somewhat “washed” from the atmosphere with precipitation. Precipitation in the San Joaquin Valley is strongly influenced by the position of the semi-permanent subtropical high-pressure belt located off the Pacific coast. In the winter, this high- pressure system moves southward, allowing Pacific storms to move through the San Joaquin Valley. These storms bring in moist, maritime air that produces considerable precipitation on the western, upslope side of the Coast Ranges. Significant precipitation also occurs on the western side of the Sierra Nevada. On the valley floor, however, there is some down slope flow from the Coast Ranges and the resultant evaporation of moisture from associated warming results in a minimum of precipitation. Nevertheless, the majority of the precipitation falling in the San Joaquin Valley is produced by those storms during the winter. Precipitation during the summer months is in the form of convective rain showers and is rare. It is usually associated with an influx of moisture into the San Joaquin Valley through the San Francisco area during an anomalous flow pattern in the lower layers of the atmosphere. Although the hourly rates of precipitation from these storms may be high, their rarity keeps monthly totals low.

Precipitation on the San Joaquin Valley floor and in the Sierra Nevada decreases from north to south. Stockton in the north receives about 20 inches of precipitation per year, Fresno in the center, receives about 10 inches per year, and Bakersfield at the southern end of the valley receives less than 6 inches per year. This is primarily because the Pacific storm track often passes through the northern part of the state while the southern part of the state remains protected by the Pacific High. Precipitation in the San Joaquin Valley Air Basin (SJVAB) is confined primarily to the winter months with some also occurring in late summer and fall. Average annual rainfall for the entire San Joaquin Valley is approximately 5 to 16 inches. Snowstorms, hailstorms, and ice storms occur infrequently in the San Joaquin Valley and severe occurrences of any of these are very rare.

The winds and unstable air conditions experienced during the passage of 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 San Joaquin Valley floor. This creates strong



low-level temperature inversions and very stable air conditions. This situation leads to the San Joaquin Valley's famous Tule Fogs. The formation of natural fog is caused by local cooling of the atmosphere until it is saturated (dew point temperature). This type of fog, known as radiation fog is more likely to occur inland. Cooling may also be accomplished by heat radiation losses or by horizontal movement of a mass of air over a colder surface. This second type of fog, known as advection fog, generally occurs along the coast.

Conditions favorable to fog formation are also conditions favorable to high concentrations of CO and PM<sub>10</sub>. Ozone levels are low during these periods because of the lack of sunlight to drive the photochemical reaction. Maximum CO concentrations tend to occur on clear, cold nights when a strong surface inversion is present and large numbers of fireplaces are in use. A secondary peak in CO concentrations occurs during morning commute hours when a large number of motorists are on the road and the surface inversion has not yet broken.

The water droplets in fog, however, can act as a sink for CO and nitrogen oxides (NO<sub>x</sub>), lowering pollutant concentrations. At the same time, fog could help in the formation of secondary particulates such as ammonium sulfate. These secondary particulates are believed to be a significant contributor of winter season violations of the PM<sub>10</sub> and PM<sub>2.5</sub> standards.

## 2.4 Anthropogenic (Man-made) Sources

In addition to climatic conditions (wind, lack of rain, etc.), air pollution can be caused by anthropogenic or man-made sources. Air pollution in the SJVAB can be directly attributed to human activities, which cause air pollutant emissions. Human causes of air pollution in the Valley consist of population growth, urbanization (gas-fired appliances, residential wood heaters, etc.), mobile sources (i.e., cars, trucks, airplanes, trains, etc.), oil production, agriculture, and other socioeconomic activities. The most significant factors, which are accelerating the decline of air quality in the SJVAB, are the Valley's rapid population growth and its associated increases in traffic, urbanization, and industrial activity.

Carbon monoxide emissions overwhelmingly come from mobile sources in the San Joaquin Valley; on-road vehicles contributed 34 percent, while other mobile vehicles, such as trains, planes, and off-road vehicles, contribute another 20 percent in 2012 according to emission projections from the CARB. Motor vehicles account for significant portions of regional gaseous and particulate emissions. Local large employers such as industrial plants can also generate substantial regional gaseous and particulate emissions. In addition, construction and agricultural activities can generate significant temporary gaseous and particulate emissions (dust, ash, smoke, etc.).

Ozone is the result of a photochemical reaction between Oxides of nitrogen (NO<sub>x</sub>) and Reactive Organic Gases (ROG). Mobile sources contribute 86 percent of all NO<sub>x</sub> emitted from anthropogenic sources in 2015 based on data provided in Appendix B of the Air District's 2016 Ozone Plan. In addition, mobile sources contribute 26 percent of all the ROG emitted from



sources within the San Joaquin Valley.

The principal factors that affect air quality in and around Madera County are:

1. The sink effect, climatic subsidence and temperature inversions and low wind speeds
2. Automobile and truck travel
3. Increases in mobile and stationary pollutants generated by local urban growth

Automobiles, trucks, buses and other vehicles using hydrocarbon (HC) fuels release exhaust products into the air. Each vehicle by itself does not release large quantities; however, when considered as a group, the cumulative effect is significant.

Other sources may not seem to fit into any one of the major categories or they may seem to fit in a number of them. These could include agricultural uses, dirt roads, animal shelters; animal feed lots, chemical plants and industrial waste disposal, which may be a source of dust, odors, or other pollutants. For Madera County, this category includes several agriculturally related activities, such as plowing, harvesting, dusting with herbicides and pesticides and other related activities. Finally, industrial contaminants and their potential to produce various effects depend on the size and type of industry, pollution controls, local topography, and meteorological conditions. Major sources of industrial emissions in Madera County consist of agricultural production and processing operations, wine production, and marketing operations.

The primary contributors of PM<sub>10</sub> emissions in the San Joaquin Valley are farming activities (22%) and road dust, both paved and unpaved (35%) in 2020 according to emission projections from the CARB. Fugitive windblown dust from “open” fields contributed 14 percent of the PM<sub>10</sub>.

The four major sources of air pollutant emissions in the SJVAB include industrial plants, motor vehicles, construction activities, and agricultural activities. Industrial plants account for significant portions of regional gaseous and particulate emissions. Motor vehicles, including those from large employers, generate substantial regional gaseous and particulate emissions. Finally, construction and agricultural activities can generate significant temporary gaseous and particulate emissions (dust, ash, smoke, etc.). In addition to these primary sources of air pollution, urban areas upwind from Madera County, including areas north and west of the San Joaquin Valley, can cause or generate emissions that are transported into Madera County. All four of the major pollutant sources affect ambient air quality throughout the Air Basin.

#### **2.4.1 Motor Vehicles**

Automobiles, trucks, buses and other vehicles using hydrocarbon fuels release exhaust products into the air. Each vehicle by itself does not release large quantities; however, when considered as a group, the cumulative effect is significant.

### **2.4.2 Agricultural and Other Miscellaneous Activities**

Other sources may not seem to fit into any one of the major categories or they may seem to fit in a number of them. These could include agricultural uses, dirt roads, animal shelters, animal feed lots, chemical plants and industrial waste disposal, which may be a source of dust, odors, or other pollutants. For Madera County, this category includes several agriculturally related activities, such as plowing, harvesting, dusting with herbicides and pesticides and other related activities.

### **2.4.3 Industrial Plants**

Industrial contaminants and their potential to produce various effects depend on the size and type of industry, pollution controls, local topography, and meteorological conditions. Major sources of industrial emissions in Madera County consist of agricultural production and processing operations, wine production, and marketing operations.

## **2.5 San Joaquin Valley Air Basin Monitoring**

SJVAPCD and the CARB maintain numerous air quality monitoring sites throughout each County in the Air Basin to measure ozone, PM<sub>2.5</sub>, and PM<sub>10</sub>. It is important to note that the federal ozone 1-hour standard was revoked by the EPA and is no longer applicable for federal standards. The closest monitoring station to the Project is located at Madera's Avenue 14 and Pump Yard Monitoring Station. The station monitors particulates, ozone, carbon monoxide, and nitrogen dioxide. Monitoring data for the past three years is summarized in Table 2.

Table 3 identifies the Madera County's attainment status. As indicated, the SJVAB is nonattainment for Ozone (1 hour and 8 hour) and PM. In accordance with the FCAA, EPA uses the design value at the time of standard promulgation to assign nonattainment areas to one of several classes that reflect the severity of the nonattainment problem; classifications range from marginal nonattainment to extreme nonattainment. The FCAA contains provisions for changing the classifications using factors such as clean air progress rates and requests from States to move areas to a higher classification.

On April 16, 2004 EPA issued a final rule classifying the SJVAB as extreme nonattainment for Ozone, effective May 17, 2004 (69 FR 20550). The (federal) 1-hour ozone standard was revoked on June 6, 2005. However, many of the requirements in the 1-hour attainment plan (SIP) continue to apply to the SJVAB. The current ozone plan is the (federal) 8-hour ozone plan adopted in 2007. The SJVAB was reclassified from a "serious" nonattainment area for the 8-hour ozone standard to "extreme" effective June 4, 2010.

**Table 2**  
**Maximum Pollutant Levels at Madera's**  
**28261 Avenue 14 and Pump Yard Monitoring Station**

Pollutant	Time Averaging	2016	2017	2018	Standards	
		Maximums	Maximums	Maximums	National	State
Ozone (O <sub>3</sub> )	1 hour	0.097 ppm	0.101 ppm	0.097 ppm	-	0.09 ppm
Ozone (O <sub>3</sub> )	8 hour	0.088 ppm	0.092 ppm	0.082 ppm	0.070 ppm	0.070 ppm
Nitrogen Dioxide (NO <sub>2</sub> )	1 hour	34.5 ppb	46.0 ppb	46.5 ppb	100 ppb	0.18 ppm
Nitrogen Dioxide (NO <sub>2</sub> )	Annual Average	5.0 ppb	6.0 ppb	6.0 ppb	0.053 ppm	0.030 ppm
Particulates (PM <sub>10</sub> )	24 hour	122.7 µg/m <sup>3</sup>	149.5 µg/m <sup>3</sup>	*	150 µg/m <sup>3</sup>	50 µg/m <sup>3</sup>
Particulates (PM <sub>10</sub> )	Federal Annual Arithmetic Mean	30.8 µg/m <sup>3</sup>	35.3 µg/m <sup>3</sup>	*	-	20 µg/m <sup>3</sup>
Particulates (PM <sub>2.5</sub> )	24 hour	47.7 µg/m <sup>3</sup>	70.6 µg/m <sup>3</sup>	81.7 µg/m <sup>3</sup>	35 µg/m <sup>3</sup>	-
Particulates (PM <sub>2.5</sub> )	Federal Annual Arithmetic Mean	12.0 µg/m <sup>3</sup>	12.4 µg/m <sup>3</sup>	13.9 µg/m <sup>3</sup>	12 µg/m <sup>3</sup>	12 µg/m <sup>3</sup>

Source: California Air Resources Board (ADAM) Air Pollution Summaries

\* Means there was insufficient data available to determine the value.

**Table 3**  
**Madera County Attainment Status**

Pollutant	Designation/Classification	
	Federal Standards	State Standards
Ozone - 1 Hour	Revoked in 2005	Nonattainment/Severe
Ozone - 8 Hour	Nonattainment/Extreme <sup>a</sup>	No State Standard
PM10	Attainment	Nonattainment
PM2.5	Nonattainment	Nonattainment
Carbon Monoxide	Unclassified/Attainment	Unclassified
Nitrogen Dioxide	Unclassified/Attainment	Attainment
Sulfur Dioxide	Unclassified/Attainment	Attainment
Lead (Particulate)	Unclassified/Attainment	Attainment
Hydrogen Sulfide	No Federal Standard	Unclassified
Sulfates	No Federal Standard	Attainment
Visibility Reducing Particles	No Federal Standard	Unclassified

Source: ARB Website, 2020

a. Though the Valley was initially classified as serious nonattainment for the 1997 8-hour ozone standard, EPA approved Valley reclassification to extreme nonattainment in the Federal Register on May 5, 2010 (effective June 4, 2010).

Notes:

National Designation Categories

Non-Attainment Area: Any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant.

Unclassified/Attainment Area: Any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant or meets the national primary or secondary ambient air quality standard for the pollutant.

State Designation Categories

Unclassified: A pollutant is designated unclassified if the data are incomplete and do not support a designation of attainment or non-attainment.

Attainment: A pollutant is designated attainment if the State standard for that pollutant was not violated at any site in the area during a three-year period.

Non-attainment: A pollutant is designated non-attainment if there was at least one violation of a State standard for that pollutant in the area.

Non-Attainment/Transitional: A subcategory of the non-attainment designation. An area is designated non-attainment/transitional to signify that the area is close to attaining the standard for the pollutant.

## 2.6 Air Quality Standards

The FCAA, first adopted in 1963, and periodically amended since then, established National Ambient Air Quality Standards (NAAQS). A set of 1977 amendments determined a deadline for the attainment of these standards. That deadline has since passed. Other CAA amendments, passed in 1990, share responsibility with the State in reducing emissions from mobile sources.

In 1988, the State of California passed the CCAA (State 1988 Statutes, Chapter 568), which set forth a program for achieving more stringent California Ambient Air Quality Standards. The CARB implements State ambient air quality standards, as required in the CCAA, and cooperates with the federal government in implementing pertinent sections of the FCAA Amendments (FCAAA). Further, CARB regulates vehicular emissions throughout the State. The SJVAPCD regulates stationary sources, as well as some mobile sources. Attainment of the more stringent State PM10 Air Quality Standards is not currently required.

The EPA uses six "criteria pollutants" as indicators of air quality and has established for each of them a maximum concentration above which adverse effects on human health may occur. These threshold concentrations are called the NAAQS.

The SJVAPCD operates regional air quality monitoring networks that provide information on average concentrations of pollutants for which State or federal agencies have established ambient air quality standards. Descriptions of nine pollutants of importance in Madera County follow.

### 2.6.1 Ozone (1-hour and 8-hour)

The most severe air quality problem in the Air Basin is the high level of ozone. Ozone occurs in two layers of the atmosphere. The layer surrounding the earth's surface is the troposphere. Here, ground level, or "bad" ozone, is an air pollutant that damages human health, vegetation, and many common materials. It is a key ingredient of urban smog. The troposphere extends to a level about 10 miles up, where it meets the second layer, the stratosphere. The stratospheric, or "good" ozone layer, extends upward from about 10 to 30 miles and protects life on earth from the sun's harmful ultraviolet rays.

"Bad" ozone is what is known as a photochemical pollutant. It needs reactive organic gases (ROG), NO<sub>x</sub>, and sunlight. ROG and NO<sub>x</sub> are emitted from various sources throughout Madera County. In order to reduce ozone concentrations, it is necessary to control the emissions of these ozone precursors.

Significant ozone formation generally requires an adequate amount of precursors in the atmosphere and several hours in a stable atmosphere with strong sunlight. High ozone concentrations can form over large regions when emissions from motor vehicles and stationary sources are carried hundreds of miles from their origins.

Ozone is a regional air pollutant. It is generated over a large area and is transported and spread by wind. Ozone, the primary constituent of smog, is the most complex, difficult to control, and pervasive of the criteria pollutants. Unlike other pollutants, ozone is not emitted directly into the air by specific sources. Ozone is created by sunlight acting on other air pollutants (called precursors), specifically NO<sub>x</sub> and ROG. Sources of precursor gases to the photochemical reaction that form ozone number in the thousands. Common sources include consumer products, gasoline vapors, chemical solvents, and combustion products of various fuels. Originating from gas stations, motor vehicles, large industrial facilities, and small businesses such as bakeries and dry cleaners, the ozone-forming chemical reactions often take place in another location, catalyzed by sunlight and heat. High ozone concentrations can form over large regions when emissions from motor vehicles and stationary sources are carried hundreds of miles from their origins. Approximately 50 million people lived in counties with air quality levels above the EPA's health-based national air quality standard in 1994. The highest levels of ozone were recorded in Los Angeles, closely followed by the San Joaquin Valley. High levels also persist in other heavily populated areas, including the Texas Gulf Coast and much of the Northeast.

While the ozone in the upper atmosphere absorbs harmful ultraviolet light, ground-level ozone is damaging to the tissues of plants, animals, and humans, as well as to a wide variety of inanimate materials such as plastics, metals, fabrics, rubber, and paints. Societal costs from ozone damage include increased medical costs, the loss of human and animal life, accelerated replacement of industrial equipment, and reduced crop yields.

#### ✓ **Health Effects**

While ozone in the upper atmosphere protects the earth from harmful ultraviolet radiation, high concentrations of ground-level ozone can adversely affect the human respiratory system. Many respiratory ailments, as well as cardiovascular disease, are aggravated by exposure to high ozone levels. Ozone also damages natural ecosystems, such as: forests and foothill communities; agricultural crops; and some man-made materials, such as rubber, paint, and plastic. High levels of ozone may negatively affect immune systems, making people more susceptible to respiratory illnesses, including bronchitis and pneumonia. Ozone accelerates aging and exacerbates pre-existing asthma and bronchitis and, in cases with high concentrations, can lead to the development of asthma in active children. Active people, both children and adults, appear to be more at risk from ozone exposure than those with a low level of activity. Additionally, the elderly and those with respiratory disease are also considered sensitive populations for ozone.

People who work or play outdoors are at a greater risk for harmful health effects from ozone. Children and adolescents are also at greater risk because they are more likely than adults to spend time engaged in vigorous activities. Research indicates that children under 12 years of age spend nearly twice as much time outdoors daily than adults. Teenagers spend at least twice as much time as adults in active sports and outdoor activities. In addition, children inhale more air per pound of body weight than adults, and they breathe more rapidly than

adults. Children are less likely than adults to notice their own symptoms and avoid harmful exposures.

Ozone is a powerful oxidant—it can be compared to household bleach, which can kill living cells (such as germs or human skin cells) upon contact. Ozone can damage the respiratory tract, causing inflammation and irritation, and it can induce symptoms such as coughing, chest tightness, shortness of breath, and worsening of asthmatic symptoms. Ozone in sufficient doses increases the permeability of lung cells, rendering them more susceptible to toxins and microorganisms. Exposure to levels of ozone above the current ambient air quality standard leads to lung inflammation and lung tissue damage and a reduction in the amount of air inhaled into the lungs.

The CARB found ozone standards in Madera County nonattainment of Federal and State standards.

### 2.6.2 *Suspended PM (PM10 and PM2.5)*

Particulate matter pollution consists of very small liquid and solid particles that remain suspended in the air for long periods. Some particles are large or concentrated enough to be seen as soot or smoke. Others are so small they can be detected only with an electron microscope. Particulate matter is a mixture of materials that can include smoke, soot, dust, salt, acids, and metals. Particulate matter is emitted from stationary and mobile sources, including diesel trucks and other motor vehicles; power plants; industrial processes; wood-burning stoves and fireplaces; wildfires; dust from roads, construction, landfills, and agriculture; and fugitive windblown dust. PM10 refers to particles less than or equal to 10 microns in aerodynamic diameter. PM2.5 refers to particles less than or equal to 2.5 microns in aerodynamic diameter and are a subset of PM10. Particulates of concern are those that are 10 microns or less in diameter. These are small enough to be inhaled, pass through the respiratory system and lodge in the lungs, possibly leading to adverse health effects.

In the western United States, there are sources of PM10 in both urban and rural areas. Because particles originate from a variety of sources, their chemical and physical compositions vary widely. The composition of PM10 and PM2.5 can also vary greatly with time, location, the sources of the material and meteorological conditions. Dust, sand, salt spray, metallic and mineral particles, pollen, smoke, mist, and acid fumes are the main components of PM10 and PM2.5. In addition to those listed previously, secondary particles can also be formed as precipitates from chemical and photochemical reactions of gaseous sulfur dioxide (SO<sub>2</sub>) and NO<sub>x</sub> in the atmosphere to create sulfates (SO<sub>4</sub>) and nitrates (NO<sub>3</sub>). Secondary particles are of greatest concern during the winter months where low inversion layers tend to trap the precursors of secondary particulates.

The District's 2008 PM2.5 Plan built upon the aggressive emission reduction strategy adopted in the 2007 Ozone Plan and strives to bring the valley into attainment status for the 1997 NAAQS

for PM2.5. The District's 2012 PM2.5 Plan provides multiple control strategies to reduce emissions of PM2.5 and other pollutants that form PM2.5. The plan's comprehensive control strategy includes regulatory actions, incentive programs, technology advancement, policy and legislative positions, public outreach, participation and communication, and additional strategies.

### ✓ **Health Effects**

PM10 and PM2.5 particles are small enough—about one-seventh the thickness of a human hair, or smaller—to be inhaled and lodged in the deepest parts of the lung where they evade the respiratory system's natural defenses. Health problems begin as the body reacts to these foreign particles. Acute and chronic health effects associated with high particulate levels include the aggravation of chronic respiratory diseases, heart and lung disease, and coughing, bronchitis, and respiratory illnesses in children. Recent mortality studies have shown a statistically significant direct association between mortality and daily concentrations of particulate matter in the air. Non-health-related effects include reduced visibility and soiling of buildings. PM10 can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. PM10 and PM2.5 can aggravate respiratory disease and cause lung damage, cancer, and premature death.

Although particulate matter can cause health problems for everyone, certain people are especially vulnerable to adverse health effects of PM10. These "sensitive populations" include children, the elderly, exercising adults, and those suffering from chronic lung disease such as asthma or bronchitis. Of greatest concern are recent studies that link PM10 exposure to the premature death of people who already have heart and lung disease, especially the elderly. Acidic PM10 can also damage manmade materials and is a major cause of reduced visibility in many parts of the United States.

The CARB found PM10 standards in Madera County in attainment of Federal standards and nonattainment for State standards. The CARB found PM2.5 standards in Madera County nonattainment of Federal and State standards.

### **2.6.3 Carbon Monoxide (CO)**

Carbon monoxide (CO) is emitted by mobile and stationary sources as a result of incomplete combustion of hydrocarbons or other carbon-based fuels. CO is an odorless, colorless, poisonous gas that is highly reactive. CO is a byproduct of motor vehicle exhaust, contributes more than two thirds of all CO emissions nationwide. In cities, automobile exhaust can cause as much as 95 percent of all CO emissions. These emissions can result in high concentrations of CO, particularly in local areas with heavy traffic congestion. Other sources of CO emissions include industrial processes and fuel combustion in sources such as boilers and incinerators. Despite an overall downward trend in concentrations and emissions of CO, some metropolitan areas still experience



high levels of CO.

✓ **Health Effects**

CO enters the bloodstream and binds more readily to hemoglobin than oxygen, reducing the oxygen-carrying capacity of blood and thus reducing oxygen delivery to organs and tissues. The health threat from CO is most serious for those who suffer from cardiovascular disease. Healthy individuals are also affected but only at higher levels of exposure. At high concentrations, CO can cause heart difficulties in people with chronic diseases and can impair mental abilities. Exposure to elevated CO levels is associated with visual impairment, reduced work capacity, reduced manual dexterity, poor learning ability, difficulty performing complex tasks, and in prolonged, enclosed exposure, death.

The adverse health effects associated with exposure to ambient and indoor concentrations of CO are related to the concentration of carboxyhemoglobin (COHb) in the blood. Health effects observed may include an early onset of cardiovascular disease; behavioral impairment; decreased exercise performance of young, healthy men; reduced birth weight; sudden infant death syndrome (SIDS); and increased daily mortality rate.

Most of the studies evaluating adverse health effects of CO on the central nervous system examine high-level poisoning. Such poisoning results in symptoms ranging from common flu and cold symptoms (shortness of breath on mild exertion, mild headaches, and nausea) to unconsciousness and death.

The CARB found CO standards in Madera County as unclassified/attainment of Federal standards and unclassified for State standards.

#### 2.6.4 Nitrogen Dioxide (NO<sub>2</sub>)

Nitrogen oxides (NO<sub>x</sub>) is a family of highly reactive gases that are primary precursors to the formation of ground-level ozone and react in the atmosphere to form acid rain. NO<sub>x</sub> is emitted from combustion processes in which fuel is burned at high temperatures, principally from motor vehicle exhaust and stationary sources such as electric utilities and industrial boilers. A brownish gas, NO<sub>x</sub> is a strong oxidizing agent that reacts in the air to form corrosive nitric acid, as well as toxic organic nitrates.

✓ **Health Effects**

NO<sub>x</sub> is an ozone precursor that combines with Reactive Organic Gases (ROG) to form ozone. See the ozone section above for a discussion of the health effects of ozone.

Direct inhalation of NO<sub>x</sub> can also cause a wide range of health effects. NO<sub>x</sub> can irritate the lungs, cause lung damage, and lower resistance to respiratory infections such as influenza. Short-term exposures (e.g., less than 3 hours) to low levels of nitrogen dioxide (NO<sub>2</sub>) may

lead to changes in airway responsiveness and lung function in individuals with preexisting respiratory illnesses. These exposures may also increase respiratory illnesses in children. Long-term exposures to NO<sub>2</sub> may lead to increased susceptibility to respiratory infection and may cause irreversible alterations in lung structure. Other health effects associated with NO<sub>x</sub> are an increase in the incidence of chronic bronchitis and lung irritation. Chronic exposure to NO<sub>2</sub> may lead to eye and mucus membrane aggravation, along with pulmonary dysfunction. NO<sub>x</sub> can cause fading of textile dyes and additives, deterioration of cotton and nylon, and corrosion of metals due to production of particulate nitrates. Airborne NO<sub>x</sub> can also impair visibility. NO<sub>x</sub> is a major component of acid deposition in California. NO<sub>x</sub> may affect both terrestrial and aquatic ecosystems. NO<sub>x</sub> in the air is a potentially significant contributor to a number of environmental effects such as acid rain and eutrophication in coastal waters. Eutrophication occurs when a body of water suffers an increase in nutrients that reduce the amount of oxygen in the water, producing an environment that is destructive to fish and other animal life.

NO<sub>2</sub> is toxic to various animals as well as to humans. Its toxicity relates to its ability to combine with water to form nitric acid in the eye, lung, mucus membranes, and skin. Studies of the health impacts of NO<sub>2</sub> include experimental studies on animals, controlled laboratory studies on humans, and observational studies.

In animals, long-term exposure to NO<sub>x</sub> increases susceptibility to respiratory infections, lowering their resistance to such diseases as pneumonia and influenza. Laboratory studies show susceptible humans, such as asthmatics, exposed to high concentrations of NO<sub>2</sub>, can suffer lung irritation and, potentially, lung damage. Epidemiological studies have also shown associations between NO<sub>2</sub> concentrations and daily mortality from respiratory and cardiovascular causes as well as hospital admissions for respiratory conditions.

NO<sub>x</sub> contributes to a wide range of environmental effects both directly and when combined with other precursors in acid rain and ozone. Increased nitrogen inputs to terrestrial and wetland systems can lead to changes in plant species composition and diversity. Similarly, direct nitrogen inputs to aquatic ecosystems such as those found in estuarine and coastal waters can lead to eutrophication as discussed above. Nitrogen, alone or in acid rain, also can acidify soils and surface waters. Acidification of soils causes the loss of essential plant nutrients and increased levels of soluble aluminum, which is toxic to plants. Acidification of surface waters creates conditions of low pH and levels of aluminum that are toxic to fish and other aquatic organisms.

The CARB found NO<sub>2</sub> standards in Madera County as unclassified/attainment of Federal standards and attainment for State standards.

#### 2.6.5 Sulfur Dioxide (SO<sub>2</sub>)

The major source of sulfur dioxide (SO<sub>2</sub>) is the combustion of high-sulfur fuels for electricity generation, petroleum refining and shipping. High concentrations of SO<sub>2</sub> can result in temporary

breathing impairment for asthmatic children and adults who are active outdoors. Short-term exposures of asthmatic individuals to elevated SO<sub>2</sub> levels during moderate activity may result in breathing difficulties that can be accompanied by symptoms such as wheezing, chest tightness, or shortness of breath. Other effects that have been associated with longer-term exposures to high concentrations of SO<sub>2</sub>, in conjunction with high levels of PM, include aggravation of existing cardiovascular disease, respiratory illness, and alterations in the lungs' defenses. SO<sub>2</sub> also is a major precursor to PM<sub>2.5</sub>, which is a significant health concern and a main contributor to poor visibility. In humid atmospheres, sulfur oxides can react with vapor to produce sulfuric acid, a component of acid rain.

The CARB found SO<sub>2</sub> standards in the Madera County as unclassified for Federal standards and attainment for State standards.

#### 2.6.6 Lead (Pb)

Lead, a naturally occurring metal, can be a constituent of air, water, and the biosphere. Lead is neither created nor destroyed in the environment, so it essentially persists forever. Lead was used until recently to increase the octane rating in automobile fuel. Since the 1980s, lead has been phased out in gasoline, reduced in drinking water, reduced in industrial air pollution, and banned or limited in consumer products. Gasoline-powered automobile engines were a major source of airborne lead through the use of leaded fuels; however, the use of leaded fuel has been mostly phased out. Since this has occurred the ambient concentrations of lead have dropped dramatically.

Exposure to lead occurs mainly through inhalation of air and ingestion of lead in food, water, soil, or dust. It accumulates in the blood, bones, and soft tissues and can adversely affect the kidneys, liver, nervous system, and other organs. Excessive exposure to lead may cause neurological impairments such as seizures, mental retardation, and behavioral disorders. Even at low doses, lead exposure is associated with damage to the nervous systems of fetuses and young children. Effects on the nervous systems of children are one of the primary health risk concerns from lead. In high concentrations, children can even suffer irreversible brain damage and death. Children 6 years old and under are most at risk, because their bodies are growing quickly.

The CARB found Lead standards in Madera County as unclassified/attainment of Federal standards and attainment for State standards.

#### 2.6.7 Toxic Air Contaminants (TAC)

In addition to the criteria pollutants discussed above, Toxic Air Contaminants (TAC) are another group of pollutants of concern. TAC are injurious in small quantities and are regulated despite the absence of criteria documents. The identification, regulation and monitoring of TAC is relatively recent compared to that for criteria pollutants. Unlike criteria pollutants, TAC are regulated on the basis of risk rather than specification of safe levels of contamination. The ten TAC are acetaldehyde, benzene, 1,3-butadiene, carbon tetrachloride, hexavalent chromium,

para-dichlorobenzene, formaldehyde, methylene chloride, perchloroethylene, and diesel particulate matter (diesel PM). Caltrans' guidance for transportation studies references the Federal Highway Administration (FHWA) memorandum titled "Interim Guidance on Air Toxic Analysis in NEPA Documents" which discusses emissions quantification of six "priority" compounds of 21 Mobile Source Air Toxics (MSAT) identified by the United States Environmental Protection Agency (USEPA). The six-diesel exhaust (particulate matter and organic gases), benzene, 1,3-butadiene, acetaldehyde, formaldehyde, and acrolein.

Some studies indicate that diesel PM poses the greatest health risk among the TAC listed above. A 10-year research program (California Air Resources Board 1998) demonstrated that diesel PM from diesel-fueled engines is a human carcinogen and that chronic (long-term) inhalation exposure to diesel PM poses a chronic health risk. 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 admissions, emergency room visits, asthma attacks, and premature deaths among those suffering from respiratory problems.

Diesel PM differs from other TAC in that it is not a single substance but a complex mixture of hundreds of substances. Although diesel PM is emitted by diesel-fueled, internal combustion engines, the composition of the emissions varies, depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emission control system is present. Unlike the other TAC, however, no ambient monitoring data are available for diesel PM because no routine measurement method currently exists. The CARB has made preliminary concentration estimates based on a diesel PM exposure method. This method uses the CARB emissions inventory's PM10 database, ambient PM10 monitoring data, and the results from several studies to estimate concentrations of diesel PM. Table 4 depicts the CARB Handbook's recommended buffer distances associated with various types of common sources.

Existing air quality concerns within Madera County and the entire SJVAB are related to increases of regional criteria air pollutants (e.g., ozone and particulate matter), exposure to toxic air contaminants, odors, and increases in greenhouse gas emissions contributing to climate change. The primary source of ozone (smog) pollution is motor vehicles. Particulate matter is caused by dust, primarily dust generated from construction and grading activities, and smoke which is emitted from fireplaces, wood-burning stoves, and agricultural burning.

**TABLE 4**  
**Recommendations on Siting New Sensitive Land Uses Such As Residences, Schools, Daycare Centers, Playgrounds, or Medical Facilities\***

SOURCE CATEGORY	ADVISORY RECOMMENDATIONS
Freeways and High-Traffic Roads <sup>1</sup>	- Avoid siting new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day.
Distribution Centers	- Avoid siting new sensitive land uses within 1,000 feet of a distribution center (that accommodates more than 100 trucks per day, more than 40 trucks with operating transport refrigeration units (TRUs) per day, or where TRU unit operations exceed 300 hours per week).  - Take into account the configuration of existing distribution centers and avoid locating residences and other new sensitive land uses near entry and exit points.
Rail Yards	- Avoid siting new sensitive land uses within 1,000 feet of a major service and maintenance rail yard.  - Within one mile of a rail yard, consider possible siting limitations and mitigation approaches.
Ports	- Avoid siting of new sensitive land uses immediately downwind of ports in the most heavily impacted zones. Consult local air districts or the ARB on the status of pending analyses of health risks.
Refineries	- Avoid siting new sensitive land uses immediately downwind of petroleum refineries. Consult with local air districts and other local agencies to determine an appropriate separation.
Chrome Platers	- Avoid siting new sensitive land uses within 1,000 feet of a chrome plater.
Dry Cleaners Using Perchloroethylene	- Avoid siting new sensitive land uses within 300 feet of any dry cleaning operation. For operations with two or more machines, provide 500 feet. For operations with 3 or more machines, consult with the local air district.  - Do not site new sensitive land uses in the same building with perchloroethylene dry cleaning operations.
Gasoline Dispensing Facilities	- Avoid siting new sensitive land uses within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater). A 50 foot separation is recommended for typical gas dispensing facilities.

1: The recommendation to avoid siting new sensitive land uses within 500 feet of a freeway was identified in CARB's Air Quality and Land Use Handbook published in 2005. CARB recently published a technical advisory to the Air Quality and Land Use Handbook indicating that new research has demonstrated promising strategies to reduce pollution exposure along transportation corridors.

**\*Notes:**

- These recommendations are advisory. Land use agencies have to balance other considerations, including housing and transportation needs, economic development priorities, and other quality of life issues.
- Recommendations are based primarily on data showing that the air pollution exposures addressed here (i.e., localized) can be reduced as much as 80% with the recommended separation.
- The relative risk for these categories varies greatly (see Table 1-2). To determine the actual risk near a particular facility, a site-specific analysis would be required. Risk from diesel PM will decrease over time as cleaner technology phases in.
- These recommendations are designed to fill a gap where information about existing facilities may not be readily available and are not designed to substitute for more specific information if it exists. The recommended distances take into account other factors in addition to available health risk data (see individual category descriptions).
- Site-specific project design improvements may help reduce air pollution exposures and should also be considered when siting new sensitive land uses.
- This table does not imply that mixed residential and commercial development in general is incompatible. Rather it focuses on known problems like dry cleaners using perchloroethylene that can be addressed with reasonable preventative actions.
- A summary of the basis for the distance recommendations can be found in the ARB Handbook: Air Quality and Land Use Handbook: A Community Health Perspective.

Source: SJVAPCD 2020

### 2.6.8 Odors

Typically, odors are regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; in fact, an odor that is offensive to one person (e.g., from a fast-food restaurant) may be perfectly acceptable to another. It is also important to note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor.

Intensity refers to the strength of the odor. For example, a person may use the word "strong" to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air.

When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

The intensity of an odor source's operations and its proximity to sensitive receptors influences the potential significance of odor emissions. The SJVAPCD has identified some common types of facilities that have been known to produce odors in the SJV Air Basin. The types of facilities that are known to produce odors are shown in Table 5 along with a reasonable distance from the source within which, the degree of odors could possibly be significant. The Project consists of the widening of SR 233 for purposes of improving traffic operations and increasing capacity. The Project doesn't fit any of the facilities listed in Table 5.

**TABLE 5**  
**Screening Levels for Potential Odor Sources**

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

Source: SJVAPCD 2020

### 2.6.9 Naturally Occurring Asbestos (NOA)

Asbestos is a term used for several types of naturally-occurring fibrous minerals found in many parts of California. The most common type of asbestos is chrysotile, but other types are also found in California. Asbestos is commonly found in ultramafic rock and near fault zones. The amount of asbestos that is typically present in these rocks ranges from less than 1% up to approximately 25% and sometimes more. It is released from ultramafic rock when it is broken or crushed. This can happen when cars drive over unpaved roads or driveways, which are surfaced with these rocks, when land is graded for building purposes, or at quarrying operations. Asbestos is also released naturally through weathering and erosion. Once released from the rock, asbestos can become airborne and may stay in the air for long periods of time. Asbestos is hazardous and can cause lung disease and cancer dependent upon the level of exposure. The longer a person is exposed to asbestos and the greater the intensity of the exposure, the greater the chances for a health problem.

The Project's construction phase may cause asbestos to become airborne due to the construction activities that will occur on site. The Project would be required to submit a Dust Control Plan under the SJVAPCD's Rule 8021.

### 2.6.10 Greenhouse Gas Emissions

Gases that trap heat in the atmosphere are often called greenhouse gases. Some greenhouse gases such as carbon dioxide occur naturally and are emitted to the atmosphere through natural processes and human activities. Other greenhouse gases (e.g., fluorinated gases) are created and

emitted solely through human activities. The principal greenhouse gases that enter the atmosphere because of human activities are:

- ✓ **Carbon Dioxide (CO<sub>2</sub>):** Carbon dioxide enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and also as a result of other chemical reactions (e.g., manufacture of cement, asphalt paving, truck trips). Carbon dioxide is also removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle.
- ✓ **Methane (CH<sub>4</sub>):** Methane is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.
- ✓ **Nitrous Oxide (N<sub>2</sub>O):** Nitrous oxide is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.
- ✓ **Fluorinated Gases:** Hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are synthetic, powerful greenhouse gases that are emitted from a variety of industrial processes. Fluorinated gases are sometimes used as substitutes for ozone-depleting substances (i.e., CFCs, HCFCs, and halons). These gases are typically emitted in smaller quantities, but because they are potent greenhouse gases, they are sometimes referred to as High Global Warming Potential gases ("High GWP gases").

Various statewide and local initiatives to reduce California's contribution to GHG emissions have raised awareness that, even though the various contributors to and consequences of global climate change are not yet fully understood, global climate change is occurring. Every nation emits GHGs; therefore, global cooperation will be required to reduce the rate of GHG emissions.



## 3.0 Air-Quality Impacts

### 3.1 Methodology

The impact assessment for air quality focuses on potential effects the Project might have on air quality within the Madera County region. The SJVAPCD has established thresholds of significance for determining environmental significance. These thresholds 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, which are recognized to be short in duration. The long-term emissions are primarily related to the activities that will occur indefinitely as a result of Project operations. The Project will not generate any long-term emissions given the nature of the Project. Impacts will be evaluated both on the basis of CEQA Appendix G criteria and SJVAPCD significance criteria. The impacts to be evaluated will be those involving construction and operational emissions of criteria pollutants. The SJVAPCD has established thresholds for certain pollutants shown in Table 6.

**Table 6**  
**SJVAPCD Air Quality Thresholds of Significance**

Project Type	Ozone Precursor Emissions (tons/year)					
	CO	NO <sub>x</sub>	ROG	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
Construction Emissions	100	10	10	27	15	15
Operational Emissions (Permitted Equipment and Activities)	100	10	10	27	15	15
Operational Emissions (Non-Permitted Equipment and Activities)	100	10	10	27	15	15

Source: SJVAPCD 2020

#### 3.1.1 Road Construction Emissions Model

The Sacramento Metropolitan Air Quality Management District's Road Construction Emissions Model, (commonly called "SacMetro") Version 8.1.0 calculates a linear-type project's emissions (such as a pipeline or roadway) by project phase over the entire construction period. The model can be used to estimate vehicle exhaust and fugitive dust emissions.

The model is an accurate and comprehensive tool for quantifying air quality impacts from pipeline and roadway projects throughout California. The model can be used for a variety of situations where an air quality analysis is necessary or desirable such as CEQA and NEPA documents, pre-project planning, compliance with local air quality rules and regulations, etc.

### 3.2 Short-Term Impacts

Short-term impacts are mainly related to the construction phase of a project and are recognized

to be short in duration. Construction air quality impacts are generally attributable to dust and exhaust pollutants generated by equipment and vehicles. Fugitive dust is emitted both during construction activity and as a result of wind erosion over exposed earth surfaces. Clearing and earth moving activities do comprise major sources of construction dust emissions, but traffic and general disturbances of soil surfaces also generate significant dust emissions. Further, dust generation is dependent on soil type and soil moisture. Exhaust pollutants are the non-useable gaseous waste products produced during the combustion process. Engine exhaust contains CO, HC, and NO<sub>x</sub> pollutants which are harmful to the environment.

Adverse effects of construction activities cause increased dust-fall and locally elevated levels of total suspended particulate. Dust-fall can be a nuisance to neighboring properties or previously completed developments surrounding or within the Project area and may require frequent washing during the construction period.

PM<sub>10</sub> emissions can result from construction activities of the project. The SJVAPCD requires implementation of effective and comprehensive control measures, rather than a detailed quantification of emissions. The SJVAPCD has determined that compliance with Regulation VIII for all sites and other control measures will constitute sufficient mitigation to reduce PM<sub>10</sub> impacts to a level considered less-than significant.

Ozone precursor emissions are also an impact of construction activities and can be quantified through calculations. Numerous variables factored into estimating total construction emission include: level of activity, length of construction period, number of pieces and types of equipment in use, site characteristics, weather conditions, number of construction personnel, and amount of materials to be transported onsite or offsite. Additional exhaust emissions would be associated with the transport of workers and materials. Because the specific mix of construction equipment is not presently known for this project, construction emissions from equipment were estimated using the Road Construction Emissions Model.

Table 7 shows the Road Construction Emissions Model-estimated construction emissions that would be generated from construction of the Project. Results of the analysis show that emissions generated from construction of the Project will be less than the applicable SJVAPCD emission thresholds for criteria pollutants. Emissions estimates are provided in Appendix A of this report.

**Table 7**  
**Project Construction Emissions (tons/year)**

Summary Report	CO	NO <sub>x</sub>	ROG	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	CO <sub>2e</sub>
Project Site Construction Emissions Per Year	2.67	2.32	0.28	0.01	0.19	0.13	482.36
SJVAPCD Level of Significance	100	10	10	27	15	15	None
Does the Project Exceed Standard?	No	No	No	No	No	No	No

Source: Road Construction Emissions Model

### 3.2.1 Greenhouse Gas Emissions

CARB, in consultation with MPOs, has provided each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. For the Madera County Transportation Commission (MCTC) region, CARB set targets at five (5) percent per capita decrease in 2020 and a ten (10) percent per capita decrease in 2035 from a base year of 2005. MCTC's 2018 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), which was adopted in July 2018, projects that the Madera County region would achieve the prescribed emissions targets.

In 2009, the SJVAPCD adopted the following guidance documents applicable to projects within the San Joaquin Valley:

- ✓ Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA (SJVAPCD 2009), and
- ✓ District Policy: Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency (SJVAPCD 2009).

This guidance and policy are the reference documents referenced in the SJVAPCD's Guidance for Assessing and Mitigating Air Quality Impacts adopted in March 2015 (SJVAPCD 2015). Consistent with the District Guidance and District Policy above, SJVAPCD (2015) acknowledges the current absence of numerical thresholds, and recommends a tiered approach to establish the significance of the GHG impacts on the environment:

- i. If a project complies with an approved GHG emission reduction plan or GHG mitigation program which avoids or substantially reduces GHG emissions within the geographic area in which the project is located, then the project would be determined to have a less than significant individual and cumulative impact for GHG emissions;
- ii. If a project does not comply with an approved GHG emission reduction plan or mitigation program, then it would be required to implement Best Performance Standards (BPS); and
- iii. If a project is not implementing BPS, then it should demonstrate that its GHG emissions would be reduced or mitigated by at least 29 percent compared to Business as Usual (BAU).

In the event that a local air district's guidance for addressing GHG impacts does not use numerical GHG emissions thresholds, at the lead agency's discretion, a neighboring air district's GHG thresholds may be used to determine impacts. On December 5, 2008, the South Coast Air Quality Management District (SCAQMD) Governing Board adopted the staff proposal for an interim GHG significance threshold for projects where the SCAQMD is lead agency. The SCAQMD guidance identifies a threshold of 10,000 MTCO<sub>2</sub>eq./year for GHG for construction emissions amortized over a 30-year project lifetime, plus annual operation emissions. This threshold is often used by agencies, such as the California Public Utilities Commission, to evaluate GHG impacts in areas that do not have specific thresholds (CPUC 2015). Therefore, because this threshold has been

established by the SCAQMD in an effort to control GHG emissions in the largest metropolitan area in the State of California, this threshold is considered a conservative approach for evaluating the significance of GHG emissions in a more rural area, such as Madera County. Though the Project is under SJVAPCD jurisdiction, the SCAQMD GHG threshold provides some perspective on the GHG emissions generated by the Project. The Project will not generate operational emissions as noted above. However, in accordance with SCAQMD guidance, the Project's construction emissions were amortized over 30-years and compared to the 10,000 MTCO<sub>2</sub>eq./year criteria. Table 7 shows GHG emissions associated with the construction phase of the Project. Construction emissions associated with the Project amortized over 30-years equates to 16.08 MTCO<sub>2</sub>eq, which is approximately 99.8% less than the threshold identified by the SCAQMD.

### 3.3 Long-Term Emissions

Long-Term emissions from a project are generated primarily by mobile source (vehicle) emissions from a project's site and area sources such as maintenance equipment. It should be noted that the Project will not generate emissions associated with long-term emissions given the nature of the Project. All operations associated with the Project will cease upon completion of the repairs (construction) associated with the Fairmead Wastewater System Improvements Project. Therefore, operational emissions from the Project will be less than the applicable SJVAPCD emission thresholds for criteria pollutants.

### 3.4 National Environmental Policy Act (NEPA)

NEPA provides general information on the effects of federally funded projects. The Act was implemented by regulations included in the Code of Federal Regulations (40CFR6). The regulations require that projects requiring NEPA review seek to avoid or minimize adverse effects of proposed actions and to restore and enhance environmental quality as much as possible. As noted in Section 3.2 and 3.3 above, emissions generated from construction of the Project will not exceed the SJVAPCD emission thresholds. All operations associated with the Project will cease upon completion of the repairs (construction) associated with the Fairmead Wastewater System Improvements Project.

According to NEPA Guidance, project's which meet the definition contained in 40 CFR 1508.4 (Categorical Exclusion) do not require any further NEPA approvals by the Federal Highway Administration since they do not individually or cumulatively have a significant effect on the environment. FHWA Guidance indicates that the following projects meet the categorical exclusion requirements. As a result, the proposed Project will not individually or cumulatively have a significant effect on the environment.

- ✓ Infrastructure to support utility systems such as wastewater facilities.
- ✓ Alteration of and additions to existing buildings, facilities, and equipment to conform or provide conforming use specifically required by new or existing applicable legislation or regulations.

- ✓ Repair, replacement, upgrading, rebuilding, or minor relocation of pipelines within existing rights-of-way, provided that the actions are in accordance with applicable requirements.
- ✓ Construction and subsequent operation of short (generally less than 20 miles in length) pipeline segments conveying materials between existing source facilities and existing receiving facilities, provided that the pipeline segments are within previously disturbed or developed rights-of-way.

## 4.0 Impact Determinations and Recommended Mitigation

In accordance with CEQA, the effects of a project are evaluated to determine if they will result in significant adverse impacts on the environment. The criteria used to determine the significance of an air quality or greenhouse gas impact are based on the following thresholds of significance, which come from Appendix G of the CEQA Guidelines. Accordingly, air quality or greenhouse gas impacts resulting from the Project are considered significant if the Project would result in:

### Air Quality

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

### Greenhouse Gas Emissions

- a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?
- b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

## 4.1 Air Quality

### **4.1.1 Conflict with or obstruct implementation of the applicable air quality plan**

The primary way of determining consistency with the air quality plan's (AQP's) assumptions is determining consistency with the applicable General Plan to ensure that the Project's population density and land use are consistent with the growth assumptions used in the AQPs for the air basin.

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

from area general plans. AQPs detail the control measures and emission reductions required for reaching attainment of the air standards.

The applicable General Plan for the project is the Madera County and City of Chowchilla General Plans, which were adopted in 1995 and 2011, respectively. The Project is consistent with the currently adopted General Plans and is therefore consistent with the population growth and VMT applied in the plan. Therefore, the Project is consistent with the growth assumptions used in the applicable AQPs. As a result, the Project will not conflict with or obstruct implementation of any air quality plans. Therefore, no mitigation is needed.

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

The Madera County area is nonattainment for Federal and State air quality standards for ozone, in attainment of Federal standards and nonattainment for State standards for PM<sub>10</sub>, and nonattainment for Federal and State standards for PM<sub>2.5</sub>. The SJVAPCD has prepared the 2016 and 2013 Ozone Plans, 2007 PM<sub>10</sub> Maintenance Plan, and 2012 PM<sub>2.5</sub> Plan to achieve Federal and State standards for improved air quality in the SJVAB regarding ozone and PM. Inconsistency with any of the plans would be considered a cumulatively adverse air quality impact. As discussed in Section 4.1.1, the Project is consistent with the currently adopted General Plans and is therefore consistent with the population growth and VMT applied in the plan. Therefore, the Project is consistent with the growth assumptions used in the 2016 and 2013 Ozone Plan, 2007 PM<sub>10</sub> Maintenance Plan, and 2012 PM<sub>2.5</sub> Plan.

Project specific emissions that exceed the thresholds of significance for criteria pollutants would be expected to result in a cumulatively considerable net increase of any criteria pollutant for which the County is in non-attainment under applicable federal or state ambient air quality standards. It should be noted that a project isn't characterized as cumulatively insignificant when project emissions fall below thresholds of significance. As discussed in Section 3.1, the SJVAPCD has established thresholds of significance for determining environmental significance which are provided in Table 6.

As discussed above in Section 3.2, results of the analysis show that emissions generated from construction of the Project will be less than the applicable SJVAPCD emission thresholds for criteria pollutants. Per CEQA Guidelines §15064(h)(3), a Lead Agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan or mitigation program, including, but not limited to an air quality attainment or maintenance plan that provides specific requirements that will avoid or substantially lessen the cumulative problem within the geographic area in which the project is located.<sup>1</sup>

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1 San Joaquin Valley Unified Air Pollution Control District – Guide for Assessing and Mitigating Air Quality Impacts, March 19, 2015.

### Air Quality Plan

As noted above, the SJVAPCD has prepared the 2016 and 2013 Ozone Plans, 2007 PM10 Maintenance Plan, and 2012 PM2.5 Plan to achieve Federal and State standards for improved air quality in the SJVAB regarding ozone and PM. Existing and future pollutant emissions computed in the AQP are based on land uses from area general plans. The AQP details the control measures and emission reductions required for reaching attainment of the air standards.

The applicable General Plan for the project are the Madera County and City of Chowchilla General Plans, which were adopted in 1995 and 2011, respectively. The Project is consistent with the currently adopted General Plans for the Fairmead Community and is therefore consistent with the population growth and VMT applied in the plan. Therefore, the Project is consistent with the growth assumptions used in the applicable AQP. As a result, the Project will not conflict with or obstruct implementation of any air quality plans.

### Ozone/Particulate Matter

As discussed above, Project emissions would not exceed the project-level significance thresholds for ozone precursors ROG and NOx or PM10 and PM2.5 during construction and operation. The SJVAPCD considers projects that exceed the project-level thresholds of significance as cumulatively significant. The Project's emissions would not combine with other sources in the SJVAB to make a cumulatively considerable contribution to a violation of the ozone standards. Therefore, this impact is less than significant. As such, there would not be a significant contribution to health effects from ozone and particulate matter.

Based on the assessment above, the Project will not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors) and any impacts would be less than significant.

#### **4.1.3 *Expose sensitive receptors to substantial pollutant concentrations***

Sensitive receptors refer to those segments of the population 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 that have the greatest potential to attract these types of sensitive receptors include schools, parks, playgrounds, daycare centers, nursing homes, hospitals, and residential communities.

The first step in evaluating the potential for impacts to sensitive receptors for TAC's from the Project is to perform a screening level analysis. For Type A Projects, one type of screening tool is found in the CARB Handbook: Air Quality and Land Use Handbook: A Community Perspective. This handbook includes a table (depicted in Table 4) with recommended buffer distances



associated with various types of common sources. Since, the Project does not correspond with the characteristics of the source categories included in Table 4, a health risk assessment is not needed at this time. Therefore, the Project will not expose sensitive receptors to substantial pollutant concentrations and any impacts would be less than significant.

#### ***4.1.4 Result in other emissions such as those leading to odors adversely affecting a substantial number of people***

The SJVAPCD requires that an analysis of potential odor impacts be conducted for the following two situations:

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

The intensity of an odor source's operations and its proximity to sensitive receptors influences the potential significance of odor emissions. The SJVAPCD has identified some common types of facilities that have been known to produce odors in the SJV Air Basin. The types of facilities that are known to produce odors are shown in Table 5 above along with a reasonable distance from the source within which, the degree of odors could possibly be significant. The Project corresponds with specific characteristics (projects) identified in Table 5. The Project seeks to abandon the septic tanks and leach fields in Fairmead and direct wastewater flows through a new sewer trunk line to the existing City of Chowchilla's WWTF. The Project does not consist of the siting of 'new' wastewater treatment facilities, but rather the improvement of Fairmead facility components. As a result, the Project will not result in other emissions adversely affecting a substantial number of people.

## **4.2 Greenhouse Gas Emissions**

### ***4.2.1 Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment***

In the event that a local air district's guidance for addressing GHG impacts does not use numerical GHG emissions thresholds, at the lead agency's discretion, a neighboring air district's GHG thresholds may be used to determine impacts. On December 5, 2008, the South Coast Air Quality Management District (SCAQMD) Governing Board adopted the staff proposal for an interim GHG significance threshold for projects where the SCAQMD is lead agency. The SCAQMD guidance identifies a threshold of 10,000 MTCO<sub>2</sub>eq./year for GHG for construction emissions amortized over a 30-year project lifetime, plus annual operation emissions. This threshold is often used by agencies, such as the California Public Utilities Commission, to evaluate GHG impacts in areas

that do not have specific thresholds (CPUC 2015). Therefore, because this threshold has been established by the SCAQMD in an effort to control GHG emissions in the largest metropolitan area in the State of California, this threshold is considered a conservative approach for evaluating the significance of GHG emissions in a more rural area, such as Madera County. Though the Project is under SJVAPCD jurisdiction, the SCAQMD GHG threshold provides some perspective on the GHG emissions generated by the Project. The Project will not generate operational emissions as noted above. However, in accordance with SCAQMD guidance, the Project's construction emissions were amortized over 30-years and compared to the 10,000 MTCO<sub>2</sub>eq./year criteria. Table 7 shows GHG emissions associated with the construction phase of the Project. Construction emissions associated with the Project amortized over 30-years equates to 16.08 MTCO<sub>2</sub>eq, which is approximately 99.8% less than the threshold identified by the SCAQMD.

Based on the assessment above, the Project will not generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment. Therefore, any impacts would be less than significant.

#### ***4.2.2 Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases***

As noted previously, California passed the California Global Warming Solutions Act of 2006. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. Under AB 32, CARB must adopt regulations by January 1, 2011 to achieve reductions in GHGs to meet the 1990 emission cap by 2020. On December 11, 2008, CARB adopted its initial Scoping Plan, which functions as a roadmap of CARB's plans to achieve GHG reductions in California required by AB 32 through subsequently enacted regulations. CARB's 2017 Climate Change Scoping Plan builds on the efforts and plans encompassed in the initial Scoping Plan.

SB 375 requires MPOs to adopt a SCS or APS that will prescribe land use allocation in that MPO's regional transportation plan. CARB, in consultation with MPOs, has provided each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. For the MCTC region, CARB set targets at five (5) percent per capita decrease in 2020 and a ten (10) percent per capita decrease in 2035 from a base year of 2005. MCTC's 2018 RTP/SCS, which was adopted in July 2018, projects that the Madera County region would achieve the prescribed emissions targets.

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

As required by California law, city and county General Plans contain a Land Use Element that details the types and quantities of land uses that the city or county estimates will be needed for

future growth, and that designate locations for land uses to regulate growth. MCTC uses the growth projections and land use information in adopted general plans to estimate future average daily trips and then VMT, which are then provided to SJVAPCD to estimate future emissions in the AQPs. The applicable General Plan for the project is the Madera County and City of Chowchilla General Plans, which were adopted in 1995 and 2011, respectively.

The Project is consistent with the currently adopted General Plan for Madera County and the City of Chowchilla and the adopted 2018 RTP/SCS and is therefore consistent with the population growth and VMT applied in those plan documents. Therefore, the Project is consistent with the growth assumptions used in the applicable AQP. It should also be noted that yearly GHG emissions generated by the Project are approximately 99.8% less than the threshold identified by the SCAQMD (see the discussion for Impact 4.2.1 above).

Based on the assessment above, the Project will not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases. The Project further the achievement of the County's greenhouse gas reduction goals. Therefore, any impacts would be less than significant.

# APPENDIX A

## Road Construction Emissions Model Worksheets

## Road Construction Emissions Model, Version 8.1.0

Daily Emission Estimates for -> Fairmead Wastewater System Improvements Project															
Project Phases (Pounds)		ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	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		0.74	9.66	5.53	0.98	0.48	0.50	0.46	0.36	0.10	0.02	2,177.98	0.27	0.03	2,193.03
Grading/Excavation		2.75	26.29	24.29	1.81	1.31	0.50	1.25	1.15	0.10	0.05	4,969.06	0.84	0.05	5,005.30
Drainage/Utilities/Sub-Grade		2.03	17.76	15.79	1.46	0.96	0.50	0.93	0.83	0.10	0.04	3,726.23	0.45	0.04	3,749.27
Paving		1.41	16.65	11.80	0.78	0.78	0.00	0.63	0.63	0.00	0.03	3,269.96	0.59	0.04	3,295.91
Maximum (pounds/day)		2.75	26.29	24.29	1.81	1.31	0.50	1.25	1.15	0.10	0.05	4,969.06	0.84	0.05	5,005.30
Total (tons/construction project)		0.28	2.67	2.32	0.19	0.14	0.06	0.13	0.12	0.01	0.01	528.01	0.08	0.01	531.70
Notes: Project Start Year -> 2021															
Project Length (months) -> 12															
Total Project Area (acres) -> 6															
Maximum Area Disturbed/Day (acres) -> 0															
Water Truck Used? -> Yes															
		Total Material Imported/Exported Volume (yd³/day)		Daily VMT (miles/day)											
Phase		Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck								
Grubbing/Land Clearing		0	0	0	0	1,600	40								
Grading/Excavation		0	0	0	0	1,600	40								
Drainage/Utilities/Sub-Grade		0	0	0	0	1,600	40								
Paving		0	0	0	0	1,600	40								
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 -> Fairmead Wastewater System Improvements Project															
Project Phases		ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	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)
(Tons for all except CO2e. Metric tonnes for CO2e)															
Grubbing/Land Clearing		0.01	0.13	0.07	0.01	0.01	0.01	0.01	0.00	0.00	0.00	28.75	0.00	0.00	26.26
Grading/Excavation		0.15	1.39	1.28	0.10	0.07	0.03	0.07	0.06	0.01	0.00	262.37	0.04	0.00	239.75
Drainage/Utilities/Sub-Grade		0.09	0.82	0.73	0.07	0.04	0.02	0.04	0.04	0.00	0.00	172.15	0.02	0.00	157.14
Paving		0.03	0.33	0.23	0.02	0.02	0.00	0.01	0.01	0.00	0.00	64.75	0.01	0.00	59.20
Maximum (tons/phase)		0.15	1.39	1.28	0.10	0.07	0.03	0.07	0.06	0.01	0.00	262.37	0.04	0.00	239.75
Total (tons/construction project)		0.28	2.67	2.32	0.19	0.14	0.06	0.13	0.12	0.01	0.01	528.01	0.08	0.01	482.36
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.															

Road Construction Emissions Model		Version 8.1.0	
<b>Data Entry Worksheet</b>			
<p>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 &amp; User Overrides" button first before changing the Project Type or begin a new project.</p>			
<b>Input Type</b>			
Project Name	Fairmead Wastewater System Improvements Project		
Construction Start Year	2021	Enter a Year between 2014 and 2025 (inclusive)	
Project Type	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	12.00	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 lone 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	4.70	miles	
Total Project Area	5.70	acres	
Maximum Area Disturbed/Day	0.05	acres	
Water Trucks Used?	1	1. Yes 2. No	
<div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>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.</p> <p><a href="http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalseries">http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalseries</a></p> </div>			
<b>Material Hauling Quantity Input</b>			
Material Type	Phase	Haul Truck Capacity (yd <sup>3</sup> ) (assume 20 if unknown)	Import Volume (yd <sup>3</sup> /day)
Soil	Grubbing/Land Clearing	20.00	
	Grading/Excavation	20.00	
	Drainage/Utilities/Sub-Grade	20.00	
	Paving	20.00	
Asphalt	Grubbing/Land Clearing	20.00	
	Grading/Excavation	20.00	
	Drainage/Utilities/Sub-Grade	20.00	
	Paving	20.00	
<b>Mitigation Options</b>			
On-road Fleet Emissions Mitigation	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	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 ( <a href="http://www.airquality.org/ceqa/mitigation.shtml">http://www.airquality.org/ceqa/mitigation.shtml</a> ). 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		1.20		1/1/2021
Grading/Excavation		4.80		2/7/2021
Drainage/Utilities/Sub-Grade		4.20		7/3/2021
Paving		1.80		11/8/2021
<b>Totals (Months)</b>	12			

Note: Soil Hauling emission default values can be overridden in cells D61 through D64, and F61 through F64.

Soil Hauling Emissions		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					
User Input											
Miles/round trip: Grubbing/Land Clearing		30.00			0	0.00					
Miles/round trip: Grading/Excavation		30.00			0	0.00					
Miles/round trip: Drainage/Utilities/Sub-Grade		30.00			0	0.00					
Miles/round trip: Paving		30.00			0	0.00					
Emission Rates		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2
Grubbing/Land Clearing (grams/mile)		0.07	0.37	1.43	0.10	0.04	0.01	1,559.57	0.00	0.05	1,574.93
Grading/Excavation (grams/mile)		0.07	0.37	1.43	0.10	0.04	0.01	1,559.57	0.00	0.05	1,574.93
Draining/Utilities/Sub-Grade (grams/mile)		0.07	0.37	1.43	0.10	0.04	0.01	1,559.57	0.00	0.05	1,574.93
Paving (grams/mile)		0.07	0.37	1.43	0.10	0.04	0.01	1,559.22	0.00	0.05	1,574.58
Hauling Emissions		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2
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		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Asphalt Hauling emission default values can be overridden in cells D87 through D90, and F87 through F90.

Asphalt Hauling Emissions		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
User Input						
Miles/round trip: Grubbing/Land Clearing		30.00			0	0.00
Miles/round trip: Grading/Excavation		30.00			0	0.00
Miles/round trip: Drainage/Utilities/Sub-Grade		30.00			0	0.00
Miles/round trip: Paving		30.00			0	0.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2
Grubbing/Land Clearing (grams/mile)	0.07	0.37	1.43	0.10	0.04	0.01	1,559.57	0.00	0.05	1,574.9
Grading/Excavation (grams/mile)	0.07	0.37	1.43	0.10	0.04	0.01	1,559.57	0.00	0.05	1,574.9
Draining/Utilities/Sub-Grade (grams/mile)	0.07	0.37	1.43	0.10	0.04	0.01	1,559.57	0.00	0.05	1,574.9
Paving (grams/mile)	0.07	0.37	1.43	0.10	0.04	0.01	1,559.22	0.00	0.05	1,574.5
Emissions	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2
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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Worker commute default values can be overridden in cells D113 through D118.

Worker Commute Emissions		User Override of Worker Commute Default Values	Default Values								
User Input											
Miles/ one-way trip	20			Calculated Daily Trips		Calculated Daily VMT					
One-way trips/day	2										
No. of employees: Grubbing/Land Clearing	40			80		1,600.00					
No. of employees: Grading/Excavation	40			80		1,600.00					
No. of employees: Drainage/Utilities/Sub-Grade	40			80		1,600.00					
No. of employees: Paving	40			80		1,600.00					
<b>Emission Rates</b>	<b>ROG</b>	<b>CO</b>	<b>NOx</b>	<b>PM10</b>	<b>PM2.5</b>	<b>SOx</b>	<b>CO2</b>	<b>CH4</b>	<b>N2O</b>	<b>CO2e</b>	
Grubbing/Land Clearing (grams/mile)	0.02	0.99	0.10	0.05	0.02	0.00	360.03	0.01	0.00	361.48	
Grading/Excavation (grams/mile)	0.02	0.99	0.10	0.05	0.02	0.00	360.03	0.01	0.00	361.48	
Draining/Utilities/Sub-Grade (grams/mile)	0.02	0.99	0.10	0.05	0.02	0.00	360.03	0.01	0.00	361.48	
Paving (grams/mile)	0.02	0.99	0.10	0.05	0.02	0.00	359.66	0.01	0.00	361.10	
Grubbing/Land Clearing (grams/trip)	0.93	2.28	0.18	0.00	0.00	0.00	81.88	0.01	0.01	84.35	
Grading/Excavation (grams/trip)	0.93	2.28	0.18	0.00	0.00	0.00	81.88	0.01	0.01	84.35	
Draining/Utilities/Sub-Grade (grams/trip)	0.93	2.28	0.18	0.00	0.00	0.00	81.88	0.01	0.01	84.35	
Paving (grams/trip)	0.93	2.28	0.18	0.00	0.00	0.00	81.81	0.01	0.01	84.27	
<b>Emissions</b>	<b>ROG</b>	<b>CO</b>	<b>NOx</b>	<b>PM10</b>	<b>PM2.5</b>	<b>SOx</b>	<b>CO2</b>	<b>CH4</b>	<b>N2O</b>	<b>CO2e</b>	
Pounds per day - Grubbing/Land Clearing	0.23	3.90	0.39	0.17	0.07	0.01	1,284.42	0.03	0.02	1,289.97	
Tons per const. Period - Grubbing/Land Clearing	0.00	0.05	0.01	0.00	0.00	0.00	16.95	0.00	0.00	17.03	
Pounds per day - Grading/Excavation	0.23	3.90	0.39	0.17	0.07	0.01	1,284.42	0.03	0.02	1,289.97	
Tons per const. Period - Grading/Excavation	0.01	0.21	0.02	0.01	0.00	0.00	67.82	0.00	0.00	68.11	
Pounds per day - Drainage/Utilities/Sub-Grade	0.23	3.90	0.39	0.17	0.07	0.01	1,284.42	0.03	0.02	1,289.97	
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.01	0.18	0.02	0.01	0.00	0.00	59.34	0.00	0.00	59.60	
Pounds per day - Paving	0.23	3.89	0.39	0.17	0.07	0.01	1,283.08	0.03	0.02	1,288.61	
Tons per const. Period - Paving	0.00	0.08	0.01	0.00	0.00	0.00	25.40	0.00	0.00	25.51	
Total tons per construction project	0.03	0.51	0.05	0.02	0.01	0.00	169.52	0.00	0.00	170.25	

Note: Water Truck default values can be overridden in cells D145 through D148, and F145 through F148.

Water Truck Emissions		User Override of Default # Water Trucks	Program Estimate of Number of Water Trucks	User Override of Truck Miles Traveled/Vehicle/Day	Default Values Miles Traveled/Vehicle/Day	Calculated Daily VMT					
User Input											
Grubbing/Land Clearing - Exhaust	1			40.00		40.00					
Grading/Excavation - Exhaust	1			40.00		40.00					
Drainage/Utilities/Subgrade	1			40.00		40.00					
Paving	1			40.00		40.00					
<b>Emission Rates</b>	<b>ROG</b>	<b>CO</b>	<b>NOx</b>	<b>PM10</b>	<b>PM2.5</b>	<b>SOx</b>	<b>CO2</b>	<b>CH4</b>	<b>N2O</b>	<b>CO2e</b>	
Grubbing/Land Clearing (grams/mile)	0.07	0.37	1.43	0.10	0.04	0.01	1,559.57	0.00	0.05	1,574.93	
Grading/Excavation (grams/mile)	0.07	0.37	1.43	0.10	0.04	0.01	1,559.57	0.00	0.05	1,574.93	
Draining/Utilities/Sub-Grade (grams/mile)	0.07	0.37	1.43	0.10	0.04	0.01	1,559.57	0.00	0.05	1,574.93	
Paving (grams/mile)	0.07	0.37	1.43	0.10	0.04	0.01	1,559.22	0.00	0.05	1,574.58	
<b>Emissions</b>	<b>ROG</b>	<b>CO</b>	<b>NOx</b>	<b>PM10</b>	<b>PM2.5</b>	<b>SOx</b>	<b>CO2</b>	<b>CH4</b>	<b>N2O</b>	<b>CO2e</b>	
Pounds per day - Grubbing/Land Clearing	0.01	0.03	0.13	0.01	0.00	0.00	137.53	0.00	0.00	138.89	
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	1.82	0.00	0.00	1.83	
Pounds per day - Grading/Excavation	0.01	0.03	0.13	0.01	0.00	0.00	137.53	0.00	0.00	138.89	
Tons per const. Period - Grading/Excavation	0.00	0.00	0.01	0.00	0.00	0.00	7.26	0.00	0.00	7.33	
Pounds per day - Drainage/Utilities/Sub-Grade	0.01	0.03	0.13	0.01	0.00	0.00	137.53	0.00	0.00	138.89	
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.01	0.00	0.00	0.00	6.35	0.00	0.00	6.42	
Pounds per day - Paving	0.01	0.03	0.13	0.01	0.00	0.00	137.50	0.00	0.00	138.85	
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	2.72	0.00	0.00	2.75	
Total tons per construction project	0.00	0.00	0.02	0.00	0.00	0.00	18.15	0.00	0.00	18.33	

Note: Fugitive dust default values can be overridden in cells D171 through D173.

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	0.05			0.50	0.01	0.10	0.00
Fugitive Dust - Grading/Excavation	0.05			0.50	0.03	0.10	0.01
Fugitive Dust - Drainage/Utilities/Subgrade	0.05			0.50	0.02	0.10	0.00



Values in cells D183 through D216, D234 through D267, D285 through D318, and D336 through D369 are required when 'Other Project Type' is selected.

Off-Road Equipment Emissions															
Grubbing/Land Clearing	Default	Mitigation Option		Default	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
	Number of Vehicles	Override of													
	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
				Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00				Model Default Tier	Forklifts	0.13	1.17	1.18	0.08	0.08	0.00	148.03	0.05	0.00	149.63
				Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00				Model Default Tier	Tractors/Loaders/Backhoes	0.38	4.57	3.83	0.23	0.21	0.01	608.00	0.20	0.01	614.55
				Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	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 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		N/A				0	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		N/A				0	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		N/A				0	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		N/A				0	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		N/A				0	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		N/A				0	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		N/A				0	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		N/A				0	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		N/A				0	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		N/A				0	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		N/A				0	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		N/A				0	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		N/A				0	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		N/A				0	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		N/A				0	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		N/A				0	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		N/A				0	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		N/A				0	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		N/A				0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A													

Grading/Excavation	Default		Mitigation Option		Default	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Number of Vehicles	Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Equipment Tier	Type											
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	pounds/day
				Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00				Model Default Tier	Concrete/Industrial Saws	0.77	7.35	6.08	0.35	0.35	0.01	1,185.33	0.07	0.01	1,189.71
				Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00				Model Default Tier	Excavators	0.24	3.38	2.22	0.11	0.10	0.01	516.02	0.17	0.00	521.59
				Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00				Model Default Tier	Plate Compactors	0.04	0.21	0.25	0.01	0.01	0.00	34.48	0.00	0.00	34.65
				Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00				Model Default Tier	Rubber Tired Dozers	0.89	7.27	9.14	0.42	0.38	0.01	861.68	0.28	0.01	870.94
1.00				Model Default Tier	Rubber Tired Loaders	0.34	1.58	3.81	0.13	0.12	0.01	596.28	0.19	0.01	602.72
				Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00				Model Default Tier	Signal Boards	0.06	0.30	0.36	0.01	0.01	0.00	49.31	0.01	0.00	49.56
				Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00				Model Default Tier	Tractors/Loaders/Backhoes	0.19	2.28	1.92	0.11	0.10	0.00	304.00	0.10	0.00	307.27
				Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	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		N/A				0	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		N/A				0	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		N/A				0	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.0			

Drainage/Utilities/Subgrade	Default		Mitigation Option		Default	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Number of Vehicles	Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Equipment Tier	Type											
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
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.00		Model Default Tier	Air Compressors	0.29	2.42	2.04	0.13	0.13	0.00	375.26	0.03	0.00	0.00	376.75
			Model Default Tier	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
	1.00		Model Default Tier	Cement and Mortar Mixers	0.06	0.31	0.37	0.01	0.01	0.00	50.52	0.01	0.00	0.00	50.77
			Model Default Tier	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
	1.00		Model Default Tier	Cranes	0.40	1.94	4.74	0.19	0.18	0.01	546.65	0.18	0.00	0.00	552.54
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	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
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.00		Model Default Tier	Forklifts	0.13	1.17	1.18	0.08	0.08	0.00	148.03	0.05	0.00	0.00	149.63
	1.00		Model Default Tier	Generator Sets	0.36	3.68	3.17	0.17	0.17	0.01	623.04	0.03	0.00	0.00	625.23
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	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
			Model Default Tier	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
			Model Default Tier	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
			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	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
			Model Default Tier	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
			Model Default Tier	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
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.00		Model Default Tier	Signal Boards	0.06	0.30	0.36	0.01	0.01	0.00	49.31	0.01	0.00	0.00	49.56
			Model Default Tier	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
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.00		Model Default Tier	Tractors/Loaders/Backhoes	0.19	2.28	1.92	0.11	0.10	0.00	304.00	0.10	0.00	0.00	307.27
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.00		Model Default Tier	Welders	0.30	1.72	1.51	0.07	0.07	0.00	207.48	0.03	0.00	0.00	208.67
User-Defined Off-road Equipment															
Number of Vehicles		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
0.00		N/A				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		N/A				0	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		N/A				0	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		N/A				0	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	

Paving	Default	Mitigation Option		Default	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Number of Vehicles	Override of		Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
	Override of Default Number of Vehicles	Program-estimate	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)											
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.00			Model Default Tier	Cement and Mortar Mixers	0.18	0.93	1.10	0.04	0.04	0.00	151.55	0.02	0.00	152.32
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Pavers	0.24	2.81	2.50	0.12	0.11	0.00	441.07	0.14	0.00	445.82
1.00			Model Default Tier	Paving Equipment	0.19	2.52	1.92	0.09	0.09	0.00	391.47	0.13	0.00	395.69
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Rollers	0.19	1.90	1.94	0.12	0.11	0.00	257.27	0.08	0.00	260.04
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Tractors/Loaders/Backhoes	0.38	4.57	3.82	0.22	0.21	0.01	608.03	0.20	0.01	614.57
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>User-Defined Off-road Equipment</b>					ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Number of Vehicles					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
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	1.17	12.73	11.28	0.60	0.56	1,849.37	0.56	0.02	1,868.44
Paving					tons per phase	0.02	0.25	0.22	0.01	0.01	36.62	0.01	0.00	37.00
<b>Total Emissions all Phases (tons per construction period) =&gt;</b>						0.25	2.15	2.25	0.11	0.11	0.00	340.34	0.08	343.12

Equipment default values for horsepower and hours/day can be overridden in cells D391 through D424 and F391 through F424.

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		206		8
Cement and Mortar Mixers		9		8
Concrete/Industrial Saws		81		8
Cranes		226		8
Crawler Tractors		208		8
Crushing/Proc. Equipment		85		8
Excavators		163		8
Forklifts		89		8
Generator Sets		84		8
Graders		175		8
Off-Highway Tractors		123		8
Off-Highway Trucks		400		8
Other Construction Equipment		172		8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		167		8
Pavers		126		8
Paving Equipment		131		8
Plate Compactors		8		8
Pressure Washers		13		8
Pumps		84		8
Rollers		81		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		255		8
Rubber Tired Loaders		200		8
Scrapers		362		8
Signal Boards		6		8
Skid Steer Loaders		65		8
Surfacing Equipment		254		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		98		8
Trenchers		81		8
Welders		46		8

END OF DATA ENTRY SHEET

**APPENDIX D**  
**BIOLOGICAL ANALYSIS REPORT**

# BIOLOGICAL ANALYSIS REPORT

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## **CITY OF CHOWCHILLA FAIRMEAD-CHOWCHILLA WASTEWATER TREATMENT FACILITY CONNECTION PROJECT**



JULY 2020

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## BIOLOGICAL ANALYSIS REPORT

# FAIRMEAD-CHOWCHILLA WASTEWATER TREATMENT FACILITY CONNECTION PROJECT

### **Prepared for:**

City of Chowchilla  
130 S 2nd Street  
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**July 2020**



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## Acronyms and Abbreviations

BAR	Biological Analysis Report
BSA	Biological Study Area
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRPR	California Rare Plant Rank
CWA	Clean Water Act
CWHR	California Wildlife Habitat Relationships
DBH	Diameters at the Breast Heights
ESRI	Environmental Systems Research Institute
F	Fahrenheit
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
GIS	Geographic Information Systems
HCP	Habitat Conservation Plan
ITP	Incidental Take Permit
MBTA	Migratory Bird Treaty Act
MGD	Million Gallons per Day
NEPA	National Environmental Policy Act
NHD	National Hydrography Dataset
NMFS	National Marine Fisheries Service
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
RWQCB	Regional Water Quality Control Board
SR	State Route
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WWTF	Wastewater Treatment Facility

## **EXECUTIVE SUMMARY**

Quad Knopf, Inc. (QK) prepared this Biological Analysis Report (BAR) to evaluate the potential for special-status biological resources to be impacted by the construction of the Fairmead–Chowchilla Wastewater Treatment Facility Connection Project (Project) in Madera County, California.

The proposed Project is in a small, rural community southeast of the State Route (SR) 99 and SR 152 interchange in unincorporated Madera County, California. The City of Chowchilla proposes to extend service from a municipal wastewater treatment facility to the unincorporated Community of Fairmead. The City's existing 18-inch gravity sewer main will be extended south along Road 16 and then east along Avenue 24 and will terminate on the west side of SR 99 for a distance of 2.2 miles where it will connect to the new force main.

A database review and reconnaissance site visit were completed by QK Environmental Scientists to characterize existing conditions and determine the potential for special-status species and other sensitive biological resources to occur on-site that may be impacted by the Project.

The Project site is comprised of Urban, Barren, Annual Grassland, Deciduous Orchard, Dryland Grain Crop, Eucalyptus, Valley Foothill Riparian, and Riverine habitat. No sensitive natural communities were present on the Project site. Three special-status species were observed on or within 500 feet of the Project including the spiny-sealed button celery (*Eryngium spinosepalum*), western spadefoot (*Spea hammondi*), and the Swainson's hawk (*Buteo swainsoni*). In addition to these three species, 10 special-status species were determined to have a potential to occur on the Project: succulent owl's clover (*Castilleja campestris* ssp. *succulenta*), San Joaquin Valley Orcutt grass (*Orcuttia inaequalis*), hairy orcutt grass (*Orcuttia pilosa*), vernal pool fairy shrimp (*Branchinecta lynchi*), western pond turtle (*Emys marmorata*), giant garter snake (*Thamnophis gigas*), burrowing owl (*Athene cunicularia*), northern harrier (*Circus hudsonius*), American badger (*Taxidea taxus*), and San Joaquin kit fox (*Vulpes macrotis mutica*). One waterway, the Berenda Slough, three irrigation canals/ditches, three vernal pools, two basins, one ditch, and one ponding basin occurred on or within 500 feet of the Project site.

Direct and indirect impacts of the Project could include loss of suitable habitat and injury or mortality of individual special-status species. Nesting birds protected by the California Fish and Game Code and Migratory Bird Treaty Act also have a potential to occur on-site. Avoidance and minimization measures are recommended which, when implemented, would reduce Project impacts to biological resources to less than significant levels.

## **SECTION 1 - INTRODUCTION**

Quad Knopf, Inc. (QK) prepared this Biological Analysis Report (BAR) to evaluate the potential for sensitive biological resources to be impacted by the construction of the Fairmead-Chowchilla Wastewater Treatment Facility Connection Project (Project) in Madera County, California.

### **1.1 - Project Location**

The proposed Project is in a small, rural community located southeast of State Route (SR) 99 and SR 152 interchange in unincorporated Madera County, California (Figures 1-1 and 1-2). It is within the Berenda and Chowchilla U.S. Geological Survey (USGS) 7.5-minute quadrangles, and within Sections 2, 3, 4, 5, 6, 10, 11, 31, 32, 33, and 34, Township 9 South and 10 South, Range 16 East, Mount Diablo Base and Meridian.

### **1.2 - Project Description**

The City of Chowchilla proposes to extend service from a municipal Wastewater Treatment Facility (WWTF) to the unincorporated Community of Fairmead (see Figure 1-2). The City's existing 18-inch gravity sewer main will be extended south along Road 16 and then east along Avenue 24 and will terminate on the west side of SR 99 for a distance of 2.2 miles where it will connect to a new force main in Fairmead. The proposed Project includes a collection system, pump station, force main and gravity main with wastewater treatment and disposal occurring at an existing City of Chowchilla WWTF. The Project will include the following components:

- Fairmead Gravity Collection System and Lift Station

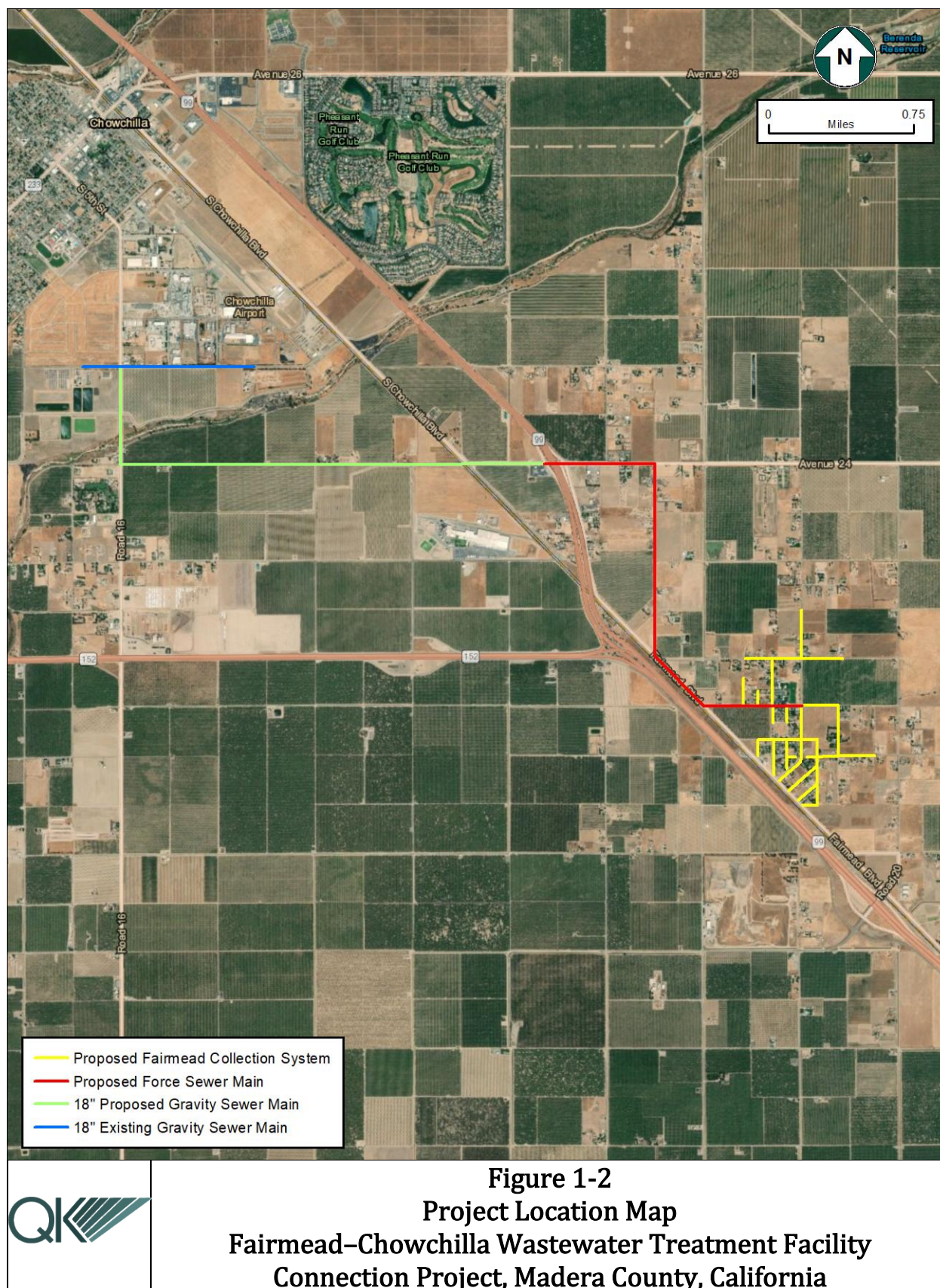
The proposed Project would abandon the residential, public, and commercial reliance upon existing septic tanks and leach fields in Fairmead. The wastewater would instead flow into a new sewer collection system within Fairmead. Approximately 175 residential connections, the Fairmead Elementary School, and a commercial property will be serviced by this new collection system. The new sewer collection system will drain to a centrally located pump lift station in 4-inch to 10-inch diameter sewer pipes, with 4-foot or 5-foot diameter manholes spaced at least every 500 feet. Gravity sewer trenches will be 1.5 feet to 3 feet wide and vary from 3 feet to 20 feet deep. The sewer lift station will be centrally located in Fairmead, 20 to 25 feet deep, with appurtenances to include a standby generator, an earthen emergency basin, an odor control scrubber, and a small building to house electrical panels, all on a one-acre site.

- Force Main and Gravity Sewer Line

The proposed lift station will discharge effluent to a force main that will consist of one or two 4-inch to 8-inch diameter pipes approximately 2.5 miles long from the Community of Fairmead to Avenue 24 on the west side of SR 99, inside the City of Chowchilla. The City's existing 18-inch gravity sewer main will be extended south









along Road 16 and then east along Avenue 24 and will terminate on the west side of SR 99 after 2.2 miles, where it will connect to the new force main. Both the force main and gravity main will be installed in the roadway and roadway shoulders. The precise footprint of the pipe alignment has not been determined, but it will be within the public right-of-way and can be expected to vary from within the road to either side of the road to avoid existing utilities and important biological resources.

The area of disturbance may be up to 20 feet from either side of the road. During construction there will be an open cut trench, 3 feet to 5 feet wide, and from 3 feet to 20 feet deep. The alignment will jack and bore the pipeline beneath SR 99 and the Union Pacific railroad tracks, as well as beneath Berenda Slough, to avoid disturbance to water and sensitive habitat areas. Alternatively, it is possible that the gravity line would be tied to the underside of the Road 16 bridge over Berenda Slough, which will be determined as the Project design is finalized. There are also three canal crossings that may use open trench methods but tunneling may be required at those locations if water is present.

The total length of both the proposed gravity line and the proposed force main segments will be 4.7 miles. Construction staging and materials storage will be within the City's existing WWTF compound. With the additional wastewater flow from Fairmead being conveyed through the existing 18-inch gravity main, peak flows may cause a back-up where the existing and proposed lines come together at the intersection of Avenue 24½ and Road 16. To alleviate potential flow disruption, a short length of 10-inch pipe at that connection will be replaced with 24-inch pipe with two manholes.

- **Wastewater Treatment Facility Improvements**

To satisfy the need for additional capacity to serve Fairmead, and the redundancy needed to serve both Chowchilla and Fairmead, a 0.9 Million Gallons per Day (MGD) package treatment plant will be constructed. The addition of Fairmead to the system would push the existing flows to over 0.9 MGD, which is the current plant capacity with one of the treatment trains offline. Construction of a new 0.9 MGD package treatment plant would act as a third treatment train and bring the effective capacity to 1.8 MGD, although the system is not expected to operate at this level because one train will be cycled offline for maintenance during normal operations. The new package treatment plant offers redundancy during maintenance periods and its more current and efficient design would make it the primary treatment train.

Construction is anticipated to begin in April 2022 and would take approximately seven months, with completion scheduled for November 2022. All pipeline segments and Project components are anticipated to be built simultaneously. The required vehicles and equipment that are anticipated for construction activities include forklifts, tractors, loaders, backhoes, concrete and industrial saws, excavators, plate compactors, signal boards, air compressors, cement and mortar mixers, cranes, generator sets, welders, and pavers.

### **1.3 - Purpose, Goals, and Objectives**

The purpose of this BAR is to identify where potential sensitive biological resources may occur within the Project site, determine how those resources may be impacted by the proposed Project, and recommend avoidance and minimization measures to reduce the potential for impact to a less than significant level. This BAR has been prepared to support an analysis of biological conditions as required by the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA), and to support regulatory permit applications, if needed.

## **SECTION 2 - METHODS**

### **2.1 - Definition of Biological Study Area**

The Biological Study Area (BSA) consists of the Project site and a 500-foot buffer surrounding the Project site (Figure 2-1).

### **2.2 - Definition of Special-Status Species**

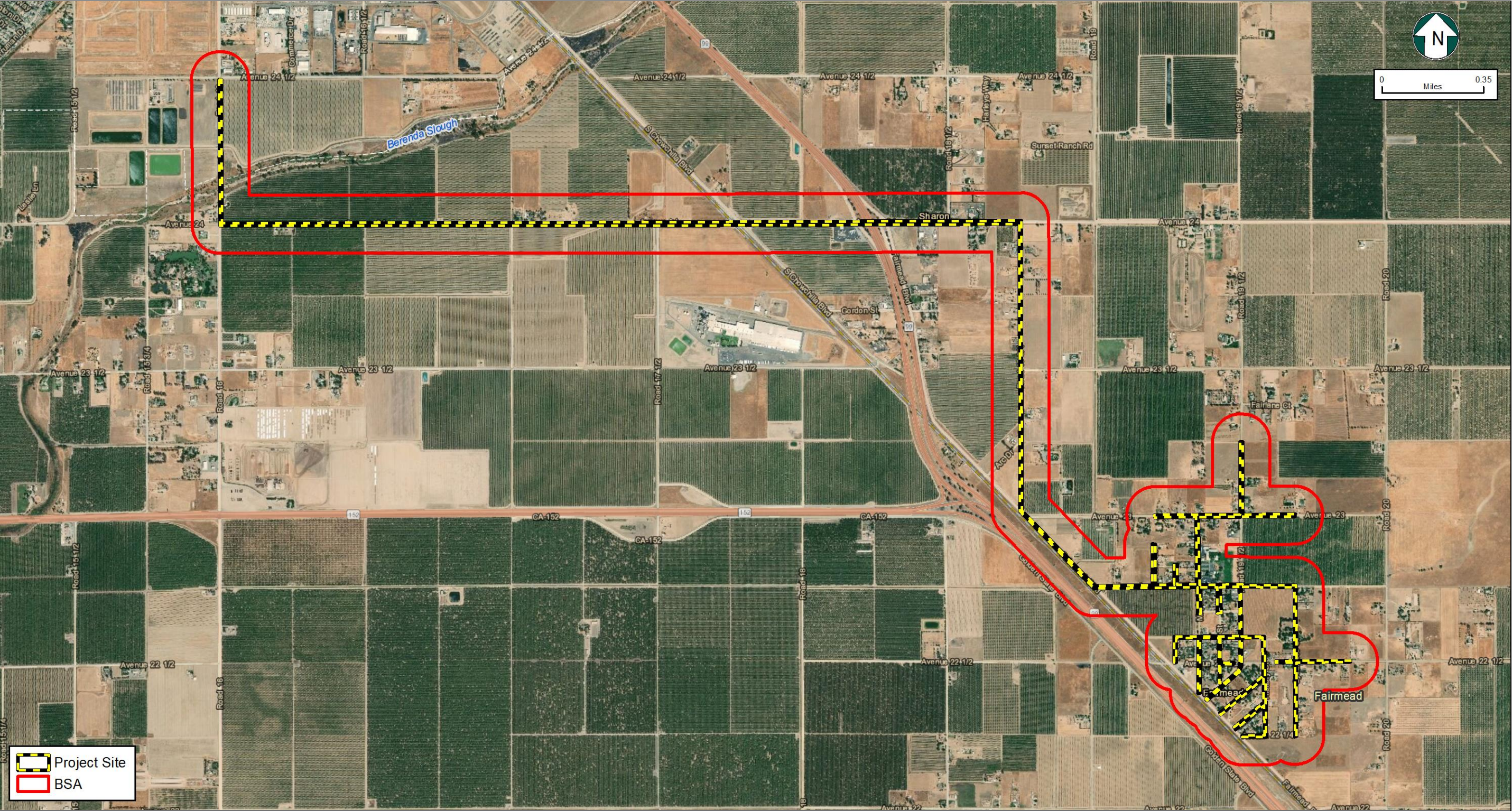
Special-status species evaluated in this report include:

- Species listed as threatened or endangered under the Federal Endangered Species Act (FESA). Species that are under review by the United States fish and Wildlife Service (USFWS) or National Marine Fisheries Service (NMFS) may be included if there is a reasonable expectation of listing within the life of the Project,
- Species listed as candidate, threatened, or endangered under the California Endangered Species Act (CESA),
- Species designated as Fully Protected, Species of Special Concern, or included on a Watch List by the California Department of Fish and Wildlife (CDFW),
- Other species included on the CDFW's Special Animals List,
- Plant species with a California Rare Plant Rank (CRPR) in categories 1 or 2, and
- Species designated as locally important by a Local Agency and/or otherwise protected through ordinance or local policy.

The potential for each special-status species to occur in the study area was evaluated according to the following criteria:

- **No.** Habitat on and adjacent to the site is clearly unsuitable to meet the needs of the species (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime), and species would have been identified on-site if present (e.g., oak trees).
- **Yes.** Conditions on the site may, in some way, support a portion of the species ecology (foraging, reproduction, movement/migration). Negative survey results independent of other information does not exclude the potential for a species to occur.
- **Present.** Species was observed on the site or has been recorded (e.g., California Natural Diversity Database, California Native Plant Society) on the site recently (within the last 5 years).





 **Figure 2-1**  
**Biological Study Area**  
**Fairmead – Chowchilla Wastewater Treatment Facility Connection Project, Madera County, California**



### **2.3 - Literature Review and Database Analysis**

The following sources were reviewed for information on special-status biological resources in the Project vicinity:

- CDFW's California Natural Diversity Database (CDFW 2020a)
- CDFW's Biogeographic Information and Observation System (CDFW 2020b)
- CDFW's Special Animals List (CDFW 2020c)
- CDFW's California Wildlife Habitat Relationships (CWHR) System (Mayer and Laudenslayer 1988)
- California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants of California (CNPS 2020)
- USFWS Information for Planning and Consultation system (USFWS 2020a)
- USFWS Critical Habitat Mapper (USFWS 2020b)
- USFWS National Wetlands Inventory (USFWS 2020c)
- USGS National Hydrography Dataset (USGWS 2020a)
- Federal Emergency Management Agency (FEMA) flood zone maps (FEMA 2020)
- U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) Web Soil Survey (NRCS 2020a)
- NRCS List of Hydric Soils (NRCS 2020b)
- Current and historical aerial imagery (Google LLC 2020, Netroline 2020)
- Topographic maps (USGS 2020b)

For each of these data sources, the search was focused on the Chowchilla and Berenda, California USGS 7.5-minute quadrangles in which the Project is located, plus the surrounding ten (10) quadrangles including Kismet, Madera, Bonita Ranch, Firebaugh NE, Poso Farm, Bliss Ranch, El Nido, Plainsburg, Le Grand, and Raynor Creek. For the California Natural Diversity Database (CNDDDB), a 10-mile search radius was used.

The CNDDDB provides element-specific spatial information on individually documented occurrences of special-status species and sensitive natural communities. Some of the information available for review in the CNDDDB is still undergoing review by the CDFW; these records are identified as unprocessed data. The CNPS database provides similar information as the CNDDDB, but at a much lower spatial resolution. Much of this information in these databases is submitted opportunistically and is often focused on protected lands or on lands where various developments have been proposed. Neither database represents data collected during comprehensive surveys for special-status resources in the region. As such, the absence of recorded occurrences in these databases at any specific location does not preclude the possibility that a special-status resource could be present. The National Wetlands Inventory (NWI), National Hydrography Dataset (NHD), and Web Soil Survey provide comprehensive data, but at a low resolution that requires confirmation in the field.

The results of the database inquiries were reviewed to develop a list of sensitive biological resources that may be present in the vicinity of the Project. This list was then evaluated against existing conditions observed during the site visit of the BSA to determine which

sensitive resources have the potential to occur, and then the potential for impacts to those resources to occur from Project implementation.

## **2.4 - Reconnaissance-Level Field Surveys**

A reconnaissance survey of the BSA was conducted on April 7, 8, and 30, 2020, by QK Associate Biologist Lisa Sandoval. The survey consisted of driving a vehicle along the pipeline route and walking meandering pedestrian transects spaced 50 to 100 feet apart throughout the entire BSA, where access was available. Portions of the BSA fell within private residential and commercial properties and those areas were visually surveyed with the aid of binoculars. During the survey 100 percent visual coverage of the Project area was achieved.

General tasks completed during the survey included developing an inventory of plant and wildlife species, characterizing vegetation associations and habitat conditions within the BSA, assessing the potential for federally- and State- listed and other special-status plant and wildlife species to occur on and near the Project, and assessing the potential for migratory birds and raptors to nest on and near the Project. The Project site and a 250-foot buffer was evaluated for nesting migratory birds and a 500-foot buffer was evaluated for nesting raptors. All historical features documented by NWI and NHD were visit and verified. All locational data were recorded using Environmental Systems Research Institute (ESRI) Collector for ArcGIS software installed on an iPad. Site conditions were documented with representative photographs.

## **SECTION 3 - REGULATORY SETTING**

Regulated or sensitive resources that were studied and analyzed include special-status plant and animal species, nesting birds and raptors, sensitive plant communities, jurisdictional waters and wetlands, wildlife movement areas, and locally protected resources such as protected trees. Regulatory authority over biological resources is shared by federal, State, and local authorities. Primary authority for regulation of general biological resources lies within the land use control and planning authority of local jurisdictions (in this instance, Madera County).

Potential impacts to biological resources were analyzed based on the following list of statutes. Summaries of these statutes are provided in Appendix A.

- CEQA
- FESA
- CESA
- Federal Clean Water Act
- California Fish and Game Code
- Migratory Bird Treaty Act
- The Bald and Golden Eagle Protection Act
- Porter-Cologne Water Quality Control Act
- Madera County General Plan

## **SECTION 4 - ENVIRONMENTAL SETTING**

This section identifies the regional and local environmental setting of the Project and describes existing baseline conditions. The environmental setting of the BSA was obtained from various sources of literature, databases, and aerial photographs. Site conditions were verified and updated during multiple site surveys conducted by a QK Environmental Scientist (Table 4-1).

**Table 4-1**  
**Field Survey Personnel and Timing**

<b>Date</b>	<b>Personnel</b>	<b>Time</b>	<b>Weather Conditions</b>	<b>Temperature</b>
04/07/2020	Lisa Sandoval	10:00 – 18:30	Rain	54 - 64°F
04/08/2020	Lisa Sandoval	11:30 – 18:30	Rain	57 - 56°F
04/30/2020	Lisa Sandoval	14:00 – 17:00	Overcast	57 – 56°F

### **4.1 - Physical Characteristics**

The BSA is dominated by residential development of Fairmead, ruderal and agricultural land, a few irrigation canals, and Berenda Slough. Representative photographs of the BSA are included in Appendix B.

#### **4.1.1 - TOPOGRAPHY**

The topography of the BSA is relatively flat, varying in elevation from 220 to 255 feet above mean sea level with the lowest elevation occurring within the Berenda Slough.

#### **4.1.2 - CLIMATE**

The Project is within a region with a Mediterranean climate of hot summers and mild, wet winters. Average high temperatures range from 54° Fahrenheit (F) in January to 98°F in July, but it is not uncommon for temperatures to exceed 100°F in the summer (WRCC 2020). Average low temperatures range from 35°F in December to 61°F in July. Precipitation occurs primarily as rain, most of which falls from November to April, with an average of 10.9 inches of rainfall per year. Precipitation may also occur as a dense fog during the winter known as Tule fog. Rain rarely falls during the summer months.

#### **4.1.3 - LAND USE**

The Project footprint is mostly comprised of paved roadways with the exception of some areas where the Project traverses agricultural land consisting of almond orchards, oat fields, fallow lands dominated by non-native grassland exist. There are some artificial canals and ditches, and riparian habitat along Berenda Slough that are present within the BSA. The most southern portion of the Project is within residential areas of Fairmead. Lands surrounding the BSA consist of orchards, oat fields, annual grassland, and matrix of canals and ditches.



Historical imagery from 1946 shows similar land use of the area consisting of land that was mostly agricultural or rural (Google LLC 2020, Netronline 2020).

#### **4.1.4 - SOILS**

The BSA is underlain by 17 soil types including Alamo clay, Atwater loamy sand, Cometa sandy loams, Delhi sand, Fresno and El Peco fine sandy loams, two types of Grangeville fine sandy loam, Greenfield coarse sandy loam, Hanford fine sandy loam, Madera fine sandy loam, Pachappa fine sandy loam, Ramona sandy loam, Riverwash, San Joaquin sandy loam, two types of Traver loam, and Tujunga loamy sand (NRCS 2020a, Figure 4-1).

##### ***Alamo clay, 0 to 1 percent slopes***

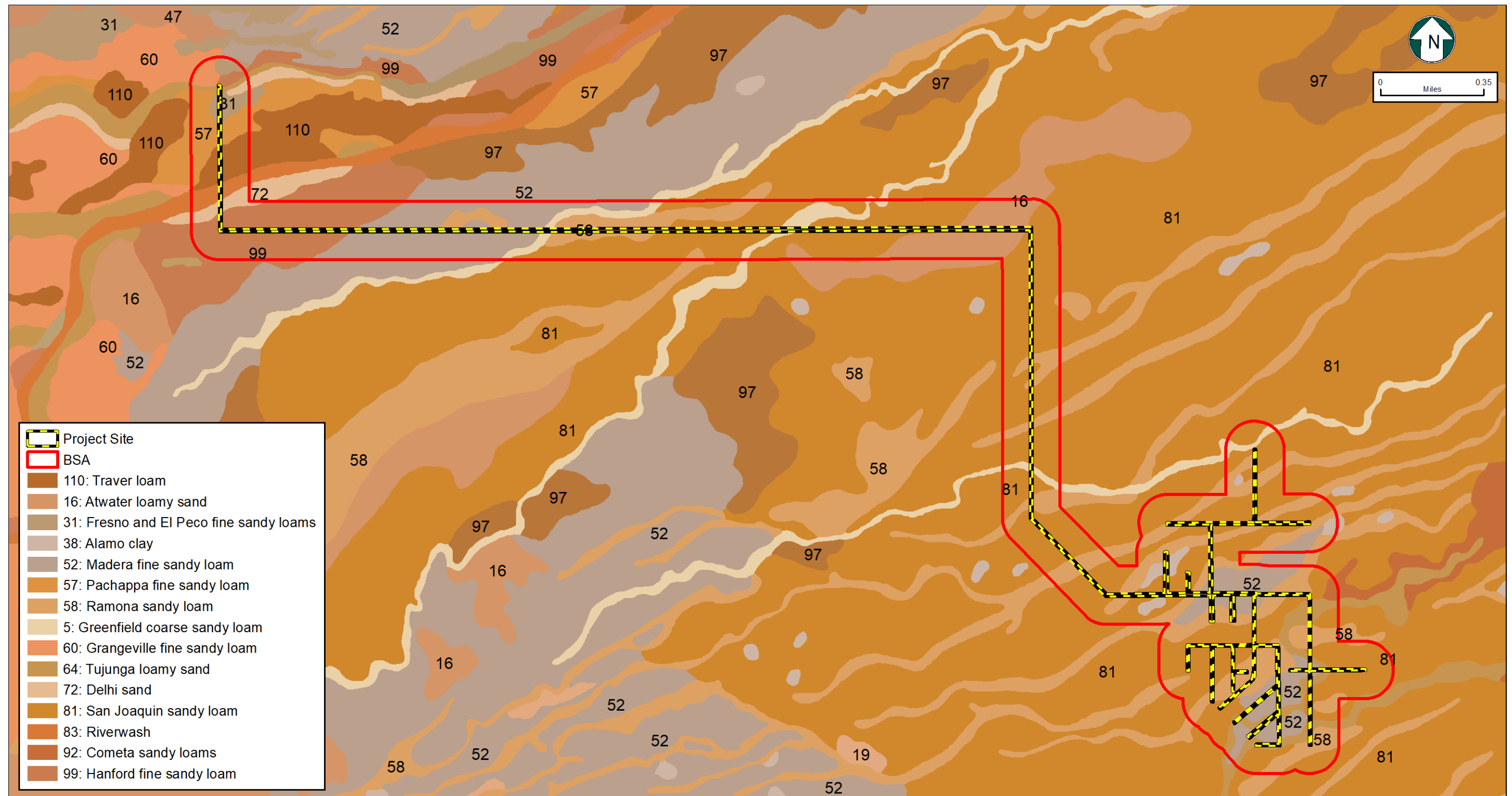
The Alamo series consists of moderately deep soils to hardpan that are poorly drained. Soils in this series are formed in alluvium from mixed sources (NRCS 2020a). Alamo soils occur in nearly level basins and drainageways on alluvial fan remnants and floodplains at elevations of 50 to 500 feet. The climate is dry subhumid with hot dry summers and cool moist winters. Alamo clay soils are poorly drained with very slow runoff and have very slow permeability. Alamo clay soils are used mainly for pasture, but some areas are used to grow dry-farmed grains or rice. Vegetation consists of annual grasses, forbs, and weeds. Alamo clay soils are hydric soils (NRCS 2020b).

##### ***Atwater loamy sand, 0 to 3 percent slopes***

The Atwater series consists of very deep, well drained soils formed in granitic alluvium. Atwater soils occur on gently undulating to rolling dunes formed from granitic alluvium (NRCS 2020a). This soil type occurs at elevations of less than 500 feet, in a semiarid, mesothermal climate with mean annual rainfall of 9 to 20 inches, with hot, dry summers and cool, moist winters. This soil type is well drained with moderately rapid permeability and slow runoff. Atwater soils are used mainly for production of truck crops, grapes, tree fruits, nuts, grain, and alfalfa. Vegetation consists of annual grasses, weeds, and low-growing shrubs. This soil type is not hydric (NRCS 2020b).

##### ***Cometa sandy loams, 3 to 8 percent slopes***

The Cometa soil series consists of moderately deep, and moderately to well drained soils. These soils are formed in alluvium derived from granitic rock sources (NRCS 2020a). These soils occur on gently sloping, slightly dissected older stream terraces. They have very slow permeability and slow to medium runoff. This soil type is used for growing rice, vineyards, orchards, and dry-farmed grain. Vegetation consisting of annual grasses, forbs, and weedy species grow in uncultivated areas of this soil type. Cometa soils are hydric (NRCS 2020b).



**Figure 4-1**  
**Soils Mapped within the BSA**  
**Fairmead–Chowchilla Wastewater Treatment Facility Connection Project, Madera County, California**

**Delhi sand, 0 to 3 percent slopes**

The Delhi series consists of very deep, somewhat excessively drained soils. They formed in wind modified material weathered from granitic rock sources (NRCS 2020a). Delhi soils are on floodplains, alluvial fans, and terraces. Slopes are 0 to 15 percent. The mean annual precipitation is about 13 inches and the mean annual temperature is about 62 degrees F. This soil type is used for growing grapes, peaches, truck crops, alfalfa, and for homesites. Principal native plants are buckwheat and a few shrubs and trees. Typical vegetation is annual grasses and forbs. This is a hydric soil (NRCS 2020b).

**Fresno and El Peco fine sandy loams, moderately saline-alkali, to 1 percent slopes**

The Fresno series is a member of the Fine-Loamy, Mixed, Thermic family of Natric Durixeralfs. Fresno soils occur in nearly level valley plains with an irregular low hummocky microrelief (NRCS 2020a). The lower part of the regolieto consists of stratified sediments principally from the granitic Sierra Nevada. Saline-alkali tolerant shrubs, weeds, and grasses predominate. Vegetation is generally sparse with bare ground being common. Fresno soils are reclaimed with moderate difficulty. Un-reclaimed soils are used for winter and spring range.

The El Peco series is a member of a coarse loamy, mixed thermic family of Typic Durorthids. These soils have very pale brown, strongly alkaline, fine sandy loam A horizons, similar C horizons overlying a strongly lime-silica cemented duripan. El Peco soils occur on nearly level to slightly depressed areas of old alluvial fans lying in the basin rim zone of large valley troughs. The microrelief is irregular, and low hummocky. These soils are developed in alluvium from granitic rock. They occur at elevations of 100 to 300 feet in a subhumid, mesothermal climate with mean annual rainfall of 8 to 9 inches, with hot, dry summers and cool, moist winters. Mean annual temperature is about 63 degrees F, average January temperature about 45 degrees F, and average July temperature about 82 degrees F. These soils are used mainly for dry pasture. Where reclaimed, cotton, alfalfa and irrigated pasture are grown with fair success. Vegetation consists of annual grasses, forbs, salt and alkali-tolerant plants such as saltgrass (*Distichlis spicata*), alkali sacaton (*Sporobolus airoides*), inkweed (*Phytolacca octandra*), alkali heath (*Frankenia salina*), coyote thistle (*Eryngium yaseyi*), and jackass clover (*Wislizenia refracta*). Fresno and El Peco soils are hydric (NRCS 2020b).

**Grangeville fine sandy loam, deep over alkali hardpan, 0 to 1 percent slopes**

The Grangeville series consists of very deep, somewhat poorly drained soils that formed in moderately coarse textured alluvium derived from granitic rock sources (NRCS 2020a). These soils occur on alluvial fans and floodplains. Most areas of Grangeville soils were historically occasionally flooded, but with stream flows largely controlled in the region, flooding occurs less often and typically only during extreme precipitation events. The Grangeville soil type is used extensively for growing alfalfa, grapes, cotton, truck crops, and for irrigated pasture. Vegetation in uncultivated areas commonly consists of annual grasses

and forbs with native alkali-tolerant plants and scattered oak (*Quercus* sp.) and cottonwood trees (*Cottonwood* sp.). Grangeville soils are hydric (NRCS 2020b).

***Grangeville fine sandy loam, slightly saline-alkali, 0 to 1 percent slopes***

The Grangeville series consists of very deep, somewhat poorly drained soils that formed in moderately coarse textured alluvium derived from granitic rock sources (NRCS 2020a). These soils occur on alluvial fans and floodplains. Most areas of Grangeville soils were historically occasionally flooded, but with stream flows largely controlled in the region, flooding occurs less often and typically only during extreme precipitation events. The Grangeville soil type is used extensively for growing alfalfa, grapes, cotton, truck crops, and for irrigated pasture. Vegetation in uncultivated areas commonly consists of annual grasses and forbs with native alkali-tolerant plants and scattered oak and cottonwood trees. Grangeville soils are hydric (NRCS 2020b).

***Greenfield coarse sandy loam, 0 to 3 percent slopes***

The Greenfield series consists of deep, well drained soils that formed in moderately coarse and coarse textured alluvium derived from granitic and mixed rock sources (NRCS 2020a). Greenfield soils are on alluvial fans and terraces at elevations of 100 to 3,500 feet. This soil type is well drained and has slow to medium runoff. It is used for producing a wide variety of irrigated field, forage, and fruit crops, and for dryland grain and pasture. Vegetation on uncultivated areas consist of annual grasses, forbs, some shrubs, and scattered oak trees. This is not a hydric soil (NRCS 2020b).

***Hanford fine sandy loam, moderately deep and deep over hardpan, 0 to 1 percent slopes***

The Hanford series consists of very deep, well drained soils that formed in moderately coarse textured alluvium dominantly formed from granite. Hanford soils are on stream bottoms, floodplains, and alluvial fans and have slopes of 0 to 15 percent. The mean annual precipitation is about 12 inches and the mean annual air temperature is about 63 degrees F. The Hanford soils are at elevations of 150 to 3,500 feet. Hanford soils are used for growing a wide range of fruits, vegetables, and general farm crops. They are also used for urban development and dairies. Vegetation in uncultivated areas is mainly annual grasses and associated herbaceous plants. This soil is not hydric (NRCS 2020b).

***Madera fine sandy loam, 0 to 3 percent slopes***

Madera series soils are moderately deep to hardpan, and are well or moderately-well drained soils that formed in old alluvium derived from granitic rock sources. Madera soils are on undulating low terraces with slopes of 0 to 9 percent (NRCS 2020a). The mean annual precipitation is about 11 inches and the mean annual temperature is about 63 degrees F. Madera soils are on hummocky, gently sloping to undulating terraces at elevations of 10 to 250 feet. Meandering drainageways and closed depressions fill with water to form vernal pools in the winter months. This soil type is used mainly for irrigated cropland such as alfalfa,

almonds, grapes, oranges, rice, and tomatoes. They are also used as irrigated pasture, dry farmed grain, and annual range. Vegetation is annual grasses and forbs. This soil type is hydric (NRCS 2020b).

***Pachappa fine sandy loam, slightly saline-alkali, 0 to 1 percent slopes***

Pachappa series soils are well drained noncalcic brown soils developed from moderately coarse textured alluvium. They occur on gently sloping alluvial fans and flood plains under annual grass-herb vegetation (NRCS 2020a). These soils are found on nearly level to very gently undulating land; the coarser textured types where exposed to wind are slightly hummocky and windblown. Pachappa soils occur at elevations under 1000 feet in a semiarid to dry subhumid mesothermal climate having a mean annual precipitation of 10 to 18 inches with hot, dry summers and cool, moist winters. These soils are mostly irrigated for growing alfalfa, small grains, and row crops, but are also sometimes used for growing dry-farmed small grains. Annual grasses, herbs and shrubs are found on this soil type when agricultural production is absent. This soil type is not hydric (NRCS 2020b).

***Ramona sandy loam, 0 to 3 percent slopes***

The Ramona series is a member of the fine-loamy, mixed, thermic family of Typic Haploxeralfs. Ramona soils are nearly level to moderately steep. They are on terraces and fans at elevations of 250 to 3,500 feet (NRCS 2020a). They formed in alluvium derived mostly from granitic and related rock sources. The climate is dry subhumid mesothermal with warm dry summers and cool moist winters. Mean annual precipitation is 10 to 20 inches. This soil type is used mostly for producing grain, grain-hay, pasture, irrigated citrus, olives, truck crops, and deciduous fruits. Uncultivated areas have a cover of annual grasses, forbs, chamise, or chaparral. This soil type is hydric (NRCS 2020b).

***Riverwash***

Riverwash consists of barren alluvial areas, usually coarse-textured sandy, silty, clayey, or gravelly sediment that is flooded, washed, and reworked frequently by river systems. Riverwash is found along streambeds in low water conditions and is subject to shifting during normal highwater conditions. Riverwash soils are nearly level to very gently undulating; the coarser textured types prevail when exposed to wind and are slightly hummocky when wind-blown. These soils occur at elevations under 1,000 feet in a semiarid to dry sub-humid mesothermal climate having a mean annual precipitation of 10 to 18 inches with hot, dry summers and cool, moist winters (NRCS 2020b).

***San Joaquin sandy loam, 0 to 3 percent slopes***

The San Joaquin series consists of well and moderately well drained soils that formed in alluvium derived from mixed but dominantly granitic rock sources and is moderately deep to a duripan (NRCS 2020a). This soil type occurs on undulating low terraces with slopes of 0 to 9 percent. San Joaquin soils are on hummocky, nearly level to undulating terraces at elevations of about 20 to 500 feet. Some areas have been leveled. They formed in alluvium

from mixed but mainly granitic rock sources. The climate is dry with hot dry summers and cool moist and foggy winters. Well and moderately well drained. Some areas are subject to rare or occasional flooding. It is used for cropland and livestock grazing. This is a hydric soil (NRCS 2020b).

***Traver loam, moderately saline alkali, 0 to 1 percent slopes***

The Traver series is a member of a coarse-loamy, mixed, thermic family of Natric Haploxeralfs. Traver soils occur on nearly level to depressional slightly hummocky areas on alluvial fans and flood plains composed of alluvium from granitic bedrock (NRCS 2020a). They occur at elevations of less than 1,700 feet, in a semiarid mesothermal climate with mean annual rainfall of 6 to 12 inches, with hot, dry summers and cool, moist winters. Traver soils are used mainly for early spring pasture. Where reclaimed they are used for general field crops such as cotton, sugar beets, and alfalfa as well as irrigated pasture. Vegetation is salt-grass and salt-tolerant weeds; occasional spots are nearly bare of vegetation. This soil is hydric (NRCS 2020b).

***Traver loam, strongly saline-alkali, 0 to 1 percent slopes***

The Traver series is a member of a coarse-loamy, mixed, thermic family of Natric Haploxeralfs (NRCS 2020a). This soil type has a light brownish gray, calcareous, fine sandy loam A horizon, light brownish gray, calcareous, fine sandy loam Bt horizon which overlies very pale brown, calcareous fine sandy loam C horizon. The alluvium is from granitic bedrock. Traver soils occur on nearly level to depressional slightly hummocky areas on alluvial fans and flood plains composed of alluvium from granitic bedrock. They occur at elevations of less than 1,700 feet, in a semiarid mesothermal climate with mean annual rainfall of 6 to 12 inches, with hot, dry summers and cool, moist winters. This soil type is used mainly for early spring pasture. Where reclaimed they are used for general field crops such as cotton, sugar beets, and alfalfa as well as irrigated pasture. Vegetation is salt-grass and salt-tolerant weeds; occasional spots are nearly bare of vegetation. This soil is hydric (NRCS 2020b).

***Tujunga loamy sand, 0 to 3 percent slopes***

The Tujunga series consists of very deep, somewhat excessively drained soils that formed in alluvium from granitic sources. Tujunga soils are on alluvial fans and floodplains, including urban areas (NRCS 2020a). Slopes range from 0 to 12 percent. The mean annual precipitation is about 2 inches. This soil is used for grazing, citrus, grapes, other fruits, and urban residential or commercial development. Uncultivated areas have a cover of shrubs, and annual grasses and forbs. In urban areas ornamentals and turf-grass are common. This soil is not hydric (NRCS 2020b).

**4.1.5 - HYDROLOGY**

There are five waterways intersecting the BSA. These are Berenda Slough, which is designated by NHD as a stream/river and four other waterways that are designated by NHD as canals/ditches with connection to Califa Lateral A and B canals (Figure 4-2). The Berenda

Slough originates at the Chowchilla River and flows to the west where it connects to an unnamed artificial canal feature that flows to the northeast and connects to the Eastside Bypass Canal. Seven wetland features including one Riverine (R4SBA), four canals/ditches (R4SBCx, R5UBfx), and two Freshwater Emergent Wetlands (PEM1Ch and PEM1cx) were identified within the BSA (see Figure 4-2). Except for one canal/ditch, all these features were confirmed present within the BSA during the time of the survey (Figure 4-3). The Riverine feature corresponds with Berenda Slough which intersects the BSA in the north. The three canals/ditches (C1 through C3) intersect the BSA at Fairmead Boulevard (C1), at Avenue 24 (C2), and north of Berenda Slough (C3). One of the Freshwater Emergent Wetlands (W1) was documented along Fairmead Boulevard and the other Freshwater Emergent Wetland (W2) was along Avenue 24 (see Figure 4-3).

In addition to these NWI and NHD features, several other features were documented during the reconnaissance survey. These included one ponding basin collecting water at intersection of Fairmead Boulevard and Avenue 23, three dry degraded vernal pools (VP1 through VP3) in the median between SR 99 and Fairmead Boulevard on the west side of the train tracks, one ditch containing water along Road 18  $\frac{3}{4}$ , and two dry artificial basins – one located at Road 18  $\frac{3}{4}$  and Arc Drive (Basin 1) and the other (Basin 2) at Avenue 24  $\frac{1}{2}$  and Road 16 (see Figure 4-3).

The entire BSA is within an area of minimal flood hazard. One percent annual chance flood hazard occurs along Berenda Slough in the north and within the southeastern portion of Fairmead (FEMA 2020, Figure 4-4).

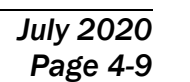
## **4.2 - Vegetation and Other Land Cover**

Eight habitat types were observed within the BSA: barren, dry grain crops, eucalyptus, annual grassland, deciduous orchard, riverine, urban, and valley foothills riparian (Figure 4-5). Habitats were characterized following the CWHR (Mayer and Laudenslayer 1988). A complete list of plant species observed is presented in Appendix C.

**Table 4-2**  
**Habitat Acreages Observed On-Site and within the BSA**

Habitat Type	Acreages	
	BSA	Project Site
Barren	13	1.53
Dryland Grain Crops	54.16	0.04
Eucalyptus	3.88	0.4
Annual Grassland	308.34	0.39
Deciduous Orchard	333.95	5.2
Riverine	5.92	1.11
Urban	274.7	41.13
Valley Foothill Riparian	6.11	0.1







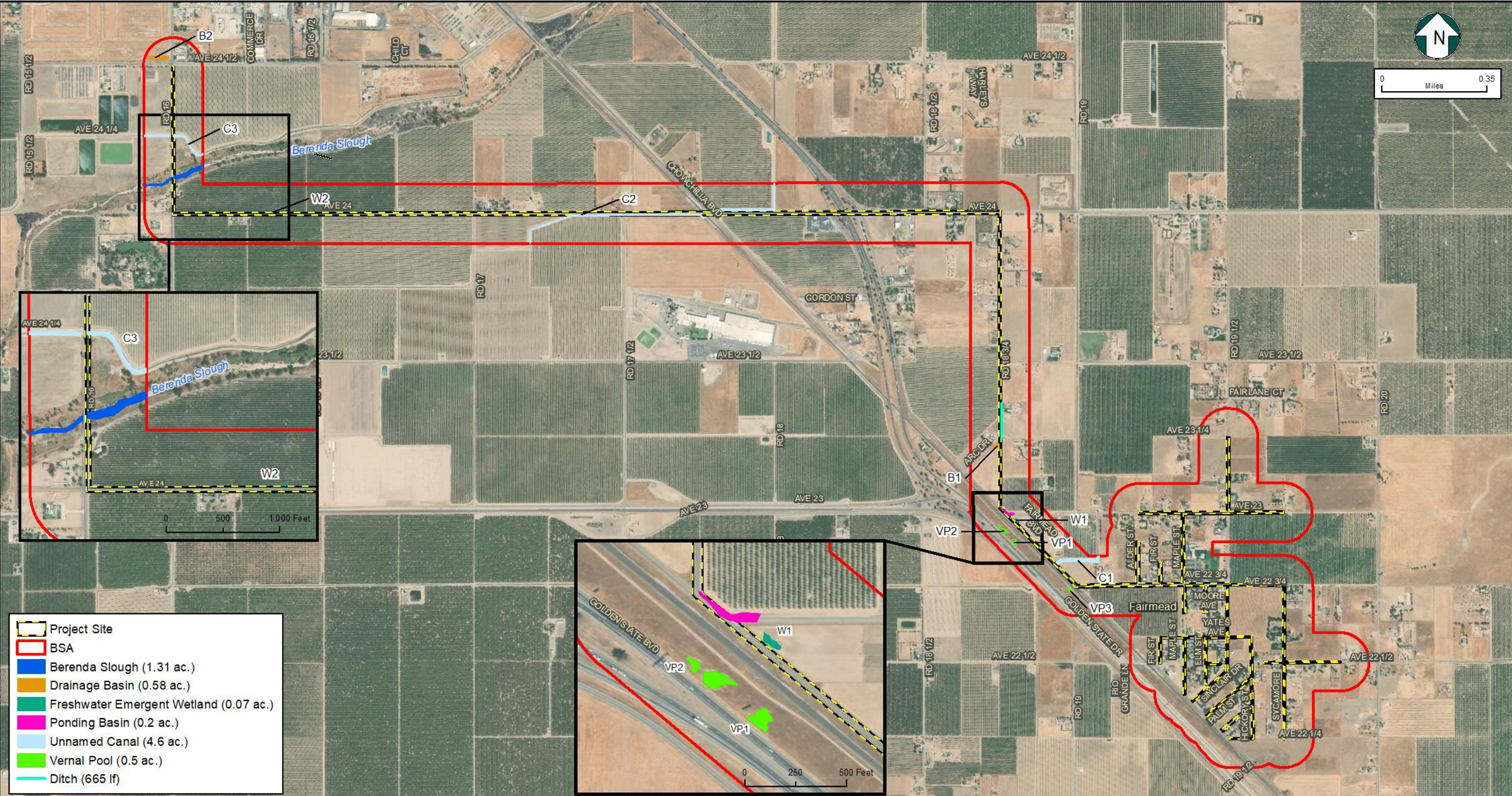
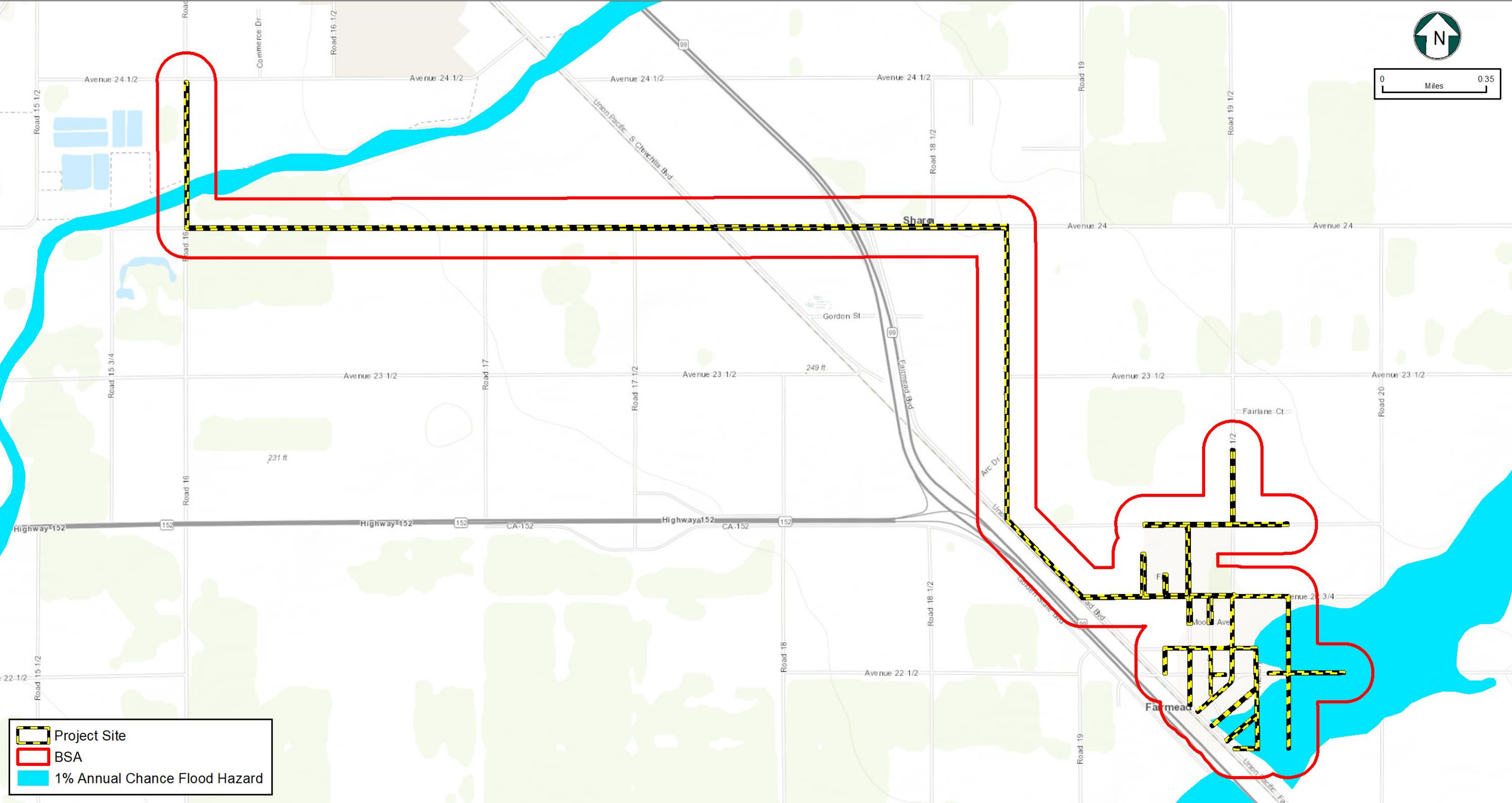


Figure 4-3  
Observed Aquatic Resources,  
Fairmead-Chowchilla Wastewater Treatment Facility Connection Project, Madera County, California







**Figure 4-4**  
**FEMA Flood Zone Map,**  
**Fairmead-Chowchilla Wastewater Treatment Facility Connection Project, Madera County, California**





**Figure 4-5**  
**Vegetation Communities within the BSA,**  
**Fairmead – Chowchilla Wastewater Treatment Facility Connection Project, Madera County, California**



#### **4.2.1 - BARREN**

Barren habitat is defined by Mayer & Laudenslayer (1988) as habitat that is absent vegetation, instead being dominated by rock, gravel, and soil. It includes any habitat with less than 2 percent vegetative cover, which is usually herbaceous, desert, or non-wildland species and less than 10 percent cover of tree or shrub species.

Only a small area of approximately 13 acres in the north portion of the BSA along Berenda Slough consists of barren habitat (see Figure 4-5). This area was mostly devoid of vegetation but did contain a few ruderal species.

#### **4.2.2 - DRYLAND GRAIN CROPS**

Vegetation in dryland grain and seed crop habitat includes seed producing annual grasses primarily composed of barley, cereal rye, oats, and wheat. They are usually planted by drilling in rows which produce solid stands, forming 100 percent canopy at maturity in good stands. They are normally planted in fall and harvested in spring. However, they may be planted in rotation with irrigated crops such as winter wheat or barley, which may be planted in the fall and then harvested in spring. Many species of rodents and birds have adapted to croplands. Hawks, owls, and other predators feed on the rodents in these areas. Deer, elk, antelope, and wild pigs forage in grain fields.

Dryland grain crops occur within the BSA and encompasses approximately 54.16 acres (see Table 4-2). This habitat contained oats and was found in a few areas along Avenue 24 and Road 18  $\frac{3}{4}$  east of SR 99 (see Figure 4-5).

#### **4.2.3 - EUCALYPTUS**

Mayer & Laudenslayer (1988) describes eucalyptus (*Eucalyptus* sp.) habitat as habitat ranging from single-species thickets with little or no shrubby understory to scattered trees over a well-developed herbaceous and shrubby understory. In most cases eucalyptus forms dense stands with a closed canopy. Stand structure of this habitat may vary considerably because most eucalyptus have been planted into rows for wind protection or dense groves for hardwood production and harvesting. Eucalyptus may also be found as monotypic stands. Tree size may vary considerably depending on spacing and species. Typically, trees may range in height from 87 to 133 feet and have diameters at the breast heights (DBH) of 8.6 to 15.1 inches. Trees 152 to 264 feet high are not uncommon. Characteristic wildlife species occupying this habitat include crow, raven, barn owl, red-tailed hawks, and red-shouldered hawks. Eucalyptus are important as roosts, perches, and nest sites for bird species, particularly raptors. Those eucalyptus with stringy bark or a tendency for rapid deposition of litter create micro habitats for small vertebrate species such as alligator lizard (*Elgaria* sp.), gopher snake (*Pituophis catenifer*), and woodrat (*Neotoma* sp.).

Eucalyptus habitat present within the BSA encompasses approximately 3.88 acres (see Table 4-2) and is dominated by silver dollar gum (*Eucalyptus pulverulenta*) and money tree (*Eucalyptus polyanthemos*). This habitat was documented in the north along Avenue 24  $\frac{1}{2}$ ,

along Berenda Slough, along Avenue 24, along SR 99, and within the residential area of Fairmead (see Figure 4-5).

#### **4.2.4 - ANNUAL GRASSLAND**

Annual grassland is described by Mayer & Laudenslayer (1988) as open grasslands composed primarily of annual plant species, which also will occur as understory plants in woodland habitats. Structure is dependent largely on weather patterns and livestock grazing, and large quantities of dead plant material may be present in summer months. Plant species of this habitat include introduced annual grasses such as brome (*Bromus* sp.) and wild oats (*Avena* sp.), and forbs such as filaree (*Erodium* sp.) and turkey mullein (*Croton setigerus*). Many wildlife species use annual grassland habitat for foraging, but some require special habitat features such as cliffs, ponds, and woodlands for breeding and refuge. Characteristic species for annual grasslands include western fence lizard (*Sceloporus occidentalis*), western rattlesnake (*Crotalus oreganus*), California ground squirrel (*Otospermophilus beecheyi*), coyote (*Canis latrans*), turkey vulture (*Cathartes aura*), burrowing owl (*Athene canicularia*), and horned lark (*Eremophila alpestris*).

Annual grassland occurs throughout a large portion of the BSA encompassing approximately 308.34 acres (see Table 4-2). Small areas of annual grassland are in the northern portion of the BSA along Ave 24 ½ and Berenda Slough, with larger areas occurring along Avenue 24 within the central portion of the BSA. Most of the annual grassland habitat occurs east of SR 99 and surrounding residential areas of Fairmead in the eastern and southern portion of the BSA (see Figure 4-5). The annual grassland habitat within the BSA was dominated by wild oats, foxtail brome (*Bromus madritensis*), ripgut brome (*Bromus diandrus*), and mustard (*Brassica* sp.). A complete list of plant species is included in Appendix C.

#### **4.2.5 - DECIDUOUS ORCHARD**

Mayer and Laudenslayer (1988) describe deciduous orchards as typically open single species tree dominated habitats. Depending on the tree type and pruning methods they are usually low, bushy trees with an open understory to facilitate harvest. Deciduous orchards include trees such as almonds, apples, apricots, cherries, figs, nectarines, peaches, pears, pecans, pistachios, plums, pomegranates, prunes, and walnuts. Trees range in height at maturity for many species from 15 to 30 feet, but may be 10 feet or less for some species (pomegranates and some dwarf varieties) or 60 feet or more (pecans and walnuts). Crowns usually touch and are usually in a linear pattern. Spacing between trees is uniform depending on desired spread of mature trees. The understory is usually composed of low-growing grasses, legumes, and other herbaceous plants, but may be managed to prevent understory growth. Wildlife such as deer and rabbit browse on the trees; other wildlife such as squirrels and birds feed on fruit or nuts. Some wildlife (e.g. mourning dove [*Zenaidura macroura*] and California quail [*Callipepla californica*]) may use this habitat for cover and nesting.

Deciduous orchard occurs throughout a large portion of the BSA and encompasses approximately 333.95 acres (see Table 4-2). Most of the orchards are in the northwestern portion of the BSA, west of SR 99, but some orchards are scattered within the BSA east of SR

99 and surrounding the residential area of Fairmead (see Figure 4-5). The orchards were mostly almond trees and some peach trees.

#### **4.2.6 - RIVERINE**

Riverine habitat is described by Mayer and Laudenslayer (1988) as intermittent or continually running water in rivers and streams. A stream originates at some elevated source, such as a spring or lake, and flows downward at a rate relative to slope or gradient and the volume of surface runoff or discharge. Velocity generally declines at progressively lower altitudes, and the volume of water increases until the enlarged stream finally becomes sluggish. Over this transition from a rapid, surging stream to a slow, sluggish river, water temperature and turbidity will tend to increase, dissolved oxygen will decrease, and the bottom will change from rocky to muddy. With increasing temperatures, decreasing velocity, and accumulating bottom sediment, organisms of the fast water are replaced by organisms adapted to slower moving water. Mollusks and crustaceans replace the rubble-dwelling insect larvae. Backswimmers, water boatmen and diving beetles inhabit sluggish stretches and backwaters. Emergent vegetation grows along riverbanks, and duckweed floats on the surface. Abundant decaying matter on the river bottom promotes the growth of plankton populations that are not usually found in fast water. The open water zones of large rivers provide resting and escape cover for many species of waterfowl. Gulls (*Chordata*), terns (*Sternidae*), osprey (*Pandion haliaetus*) and bald eagle (*Haliaeetus leucocephalus*) hunt in open water. Near-shore waters provide food for waterfowl, herons (*Ardeidae* sp.), shorebirds, belted kingfisher (*Megaceryle alcyon*), and American dipper (*Cinclus mexicanus*). Many species of insectivorous birds (swallows [*Hirundinidae*], swifts [*Apodidae*], flycatchers [*Tyrannidae*]) hawk their prey over water. Some of the more common mammals found in riverine habitats include river otter, mink, muskrat, and beaver.

Riverine habitat that occurs within the BSA encompasses approximately 5.92 acres (see Table 4-2). Riverine habitat is present at Berenda Slough in the northern portion of the BSA and in the matrix of irrigation canals and ditches (see Figure 4-5). One of the canals/ditches (C1) was between SR 99 and the residential area of Fairmead, one was along Avenue 24 (C2), and one was north of Berenda Slough (C3). The riverine habitat of Berenda Slough had no water during the time of the survey, consisted of sandy bottom, and was dominated by giant reed (*Arundo donax*) and non-native grassland species. The irrigation canals/ditches consisted of maintained features containing water and barren berms with limited ruderal vegetation.

#### **4.2.7 - URBAN**

Mayer and Laudenslayer (1988) describe urban habitat as variable with five vegetative structures defined: tree grove, street strip, shade tree/lawn, lawn, and shrub cover. These structures vary based on the associated urban development.

Urban habitat within the BSA encompasses approximately 274.70 acres (see Table 4-2) and mostly consisted of residential housing of Fairmead but also included paved roads, residential and commercial development, and associated landscaping scattered throughout

the BSA (see Figure 4-5). Vegetation commonly associated with urban habitat includes ornamental herbs (grass lawns, weeds, and flowers), shrubs, hedges, and trees, as well as ruderal species. The most common species observed within the BSA during the survey included Chinese juniper (*Juniperus chinensis*), Chinese elm (*Ulmus parvifolia*), common fig tree (*Ficus carica*), cork oak (*Quercus suber*), date palm (*Phoenix dactylifera*), Mexican fan palm (*Washingtonia robusta*), Italian cypress (*Cupressus sempervirens*), oleander (*Nerium oleander*), tree of heaven (*Ailanthus altissima*), eucalyptus, orange tree (*Citrus sinensis*), lemon tree (*Citrus limon*), and peach tree (*Prunus persica*).

#### 4.2.8 - VALLEY FOOTHILL RIPARIAN

The valley foothill riparian habitat is described by Mayer and Laudenslayer (1988) as habitat dominated cottonwoods (*Populus* sp.), California sycamore (*Platanus racemosa*), valley oak (*Quercus lobata*), white alder (*Alnus rhombifolia*), boxelder maple (*Acer negundo*), Oregon ash (*Fraxinus latifolia*) with understory shrub layer plants including wild grape (*Vitis vinifera*), wild rose (*Rosa acicularis*), California blackberry (*Rubus ursinus*), blue elderberry (*Sambucus cerulea*), poison oak (*Toxicodendron diversilobum*), buttonbrush (*Cephalanthus occidentalis*), and willows (*Salix* sp.). The herbaceous layer consists of sedges (Cyperaceae), rushes (*Juncaceae*), grasses, miner's lettuce (*Claytonia perfoliata*), Douglas sagewort (*Artemisia douglasiana*), poison-hemlock (*Conium maculatum*), and hoary nettle (*Urtica dioica*). Canopy height is up to 98 feet in a mature riparian forest, with a canopy cover of 20 to 80 percent. This habitat type provides food, water, migration and dispersal corridors, and escape, nesting, and thermal cover for many species of wildlife. Valley-foothill riparian habitats are found in valleys bordered by sloping alluvial fans, slightly dissected terraces, lower foothills, and coastal plains. They are generally associated with low velocity flows, flood plains, and gentle topography. Valleys provide deep alluvial soils and a high-water table. The substrate is coarse, with gravelly or rocky soils that are more or less permanently moist but probably well aerated.

Valley foothill riparian occurs in the northwestern portion of the BSA along Berenda Slough (see Figure 4-5) and encompasses approximately 6.11 acres (see Table 4-2). This habitat was dominated by eucalyptus trees, cottonwood, oak trees, lotus tree (*Nelumbo* sp.), poison hemlock, giant reed, foxtail, ripgut brome, wild oats, minor's lettuce, and malva (*Malva* sp.).

#### 4.3 - General Wildlife Observations

Wildlife species observed during the survey were typical of urban and agricultural habitats in the Central Valley. Bird species included American crow (*Corvus brachyrhynchos*), house sparrow (*Passer domesticus*), mourning dove, Eurasian collared dove (*Streptopelia decaocto*), white crowned sparrow (*Zonotrichia leucophrys*), California scrub jay (*Aphelocoma californica*), great egret (*Ardea alba*), great blue heron (*Ardea herodias*), and red-winged blackbird (*Agelaius phoeniceus*). Two raptors, the Swainson's hawk (*Buteo swainsoni*) and red-tailed hawk (*Buteo jamaicensis*), were overflying the Project area and perching in the nearby trees. Western spadefoots (*Spea hammondi*) were in a ponding basin along Fairmead Boulevard and Avenue 22  $\frac{3}{4}$  where water ponded along the road. California ground squirrels and their burrows were observed along SR 99 and Road 18  $\frac{3}{4}$ . One den

complex with multiple entrances was found at the berm of Basin 1 along Road 18 <sup>3</sup>/<sub>4</sub> and Arc Drive and numerous small mammal burrows were in the north bank of Berenda Slough and along Road 18 <sup>3</sup>/<sub>4</sub>. A complete list of wildlife observed is included in Appendix C.



## SECTION 5 - SENSITIVE BIOLOGICAL RESOURCES

Local, State, and federal agencies regulate special-status species and other sensitive biological resources and require an assessment of their presence or potential to be present on-site prior to the approval of a proposed development. This section discusses sensitive biological resources observed on the BSA and evaluates the potential for the BSA to support other sensitive biological resources. Assessments for the potential occurrence of special-status species were based upon known ranges, habitat preferences of the species, species occurrence records from the CNDDB and CNPS, species occurrence records from other sites in the vicinity of the BSA, previous reports for the Project site, and the results of surveys conducted at the Project site.

### 5.1 - Special-Status Species

Table 5-1 presents the list of special-status plant and animal species determined to have a potential to occur within the BSA and identifies if the Project may affect the species and threaten the viability of a population of the species. The complete list of species generated from literature and database searches and that were evaluated for this Project are included in Appendix D. From this search, it was determined that 17 species had the potential to occur on the BSA. Of these 17 species, 13 species are discussed in the subsections below. The four other species were included in the CDFW's Special Animals List, but those species have no special protection and thus were not discussed further in this document.

**Table 5-1**  
**Special-Status Species with Potential to Occur within the BSA**

Scientific Name Common Name	Status Fed/State ESA CRPR/CDFW	Potentially Affected by Project? Yes/No	Viability Threat? Yes/No
<b>Plants</b>			
<i>Castilleja campestris ssp. succulenta</i> Succulent owl's clover	FT/SE 1B.2	No	No
<i>Eryngium spinosepalum</i> Spiny-sepaled button celery	-/- 1B.2	Yes	No
<i>Orcuttia inaequalis</i> San Joaquin valley orcutt grass	FT/SE 1B.1	No	No
<i>Orcuttia pilosa</i> Hairy Orcutt grass	FT/SE 1B.1	No	No
<b>Invertebrates</b>			
<i>Branchinecta lynchi</i> Vernal pool fairy shrimp	FT/-	Yes	No
<b>Amphibians</b>			
<i>Spea hammondi</i> western spadefoot	-/- SSC	Yes	No
<b>Reptiles</b>			
<i>Emys marmorata</i> western pond turtle	-/- SSC	Yes	No

Scientific Name Common Name	Status Fed/State ESA CRPR/CDFW	Potentially Affected by Project? Yes/No	Viability Threat? Yes/No
<i>Thamnophis gigas</i> giant garter snake	FT/ST	No	No
<b>Birds</b>			
<i>Athene cunicularia</i> burrowing owl	-/- SSC	Yes	No
<i>Buteo swainsoni</i> Swainson's hawk	-/ST -	Yes	No
<i>Circus hudsonius</i> northern harrier	-/- SSC	Yes	No
<b>Mammals</b>			
<i>Taxidea taxus</i> American badger	-/- SSC	Yes	No
<i>Vulpes macrotis mutica</i> San Joaquin kit fox	FE/ST -	Yes	No
<b>CRPR (California Rare Plant Rank):</b>			
1A Presumed Extinct in California	FE	Federally Endangered	
1B Rare, Threatened, or Endangered in California and elsewhere	FT	Federally Threatened	
2A Plants presumed extirpated in California, but more common elsewhere	FC	Federal Candidate Species	
2B Plants Rare, Threatened, or Endangered in California, but more common elsewhere	FS	Federally Sensitive	
	SE	State Endangered	
	ST	State Threatened	
	SC	State Candidate	
<b>CRPR Threat Code Extension:</b>			
.1 Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)	SS	State Sensitive	
.2 Fairly endangered in California (20-80% occurrences threatened)	SSC	State Species of Special Concern	
.3 Not very endangered in California (<20% of occurrences threatened)	SFP	State Fully Protected	
	SR	State Rare	

### 5.1.1 - SPECIAL-STATUS PLANT SPECIES

The literature and database review identified 23 special-status plant species known or with potential to occur in the vicinity of the Project (Appendix D). Of those, four special-status species were determined to have potential to occur with the BSA (see Table 5-1) and are discussed below.

#### **Succulent owl's clover**

**CASTILLEJA CAMPESTRIS SSP. SUCCULENTA**

Status: Federally Threatened, State Endangered, 1B.2 Species

The succulent owl's clover is an annual herb that occurs in vernal pools, swales, and some seasonal wetlands at elevation from 165 to 2,460 feet. It blooms from April to May, sometimes as early as March. This species has been documented primarily on the eastern Central Valley floor and foothills from Fresno County north. It is threatened by urban and agricultural development, flood control, grazing, and trampling (CNPS 2020).

There were seven CNDDB records of this species within 10 miles of the BSA. The closest record (EONDX 45556) was approximately 3.7 miles to the northeast of the BSA and

consisted of four plants documented in 2001 in a vernal pool. Succulent owl's clover was not identified in the vernal pools (VP1 through VP3) in a median between SR 99 and Fairmead Boulevard but these vernal pools provide habitat that could potentially support this species.

**San Joaquin Valley orcutt grass*****ORCUTTIA INAEQUALIS***

Status: Federally Threatened, State Endangered, 1B.1 Species

The San Joaquin Valley orcutt grass is an annual herb that occurs in vernal pools at elevations between 32 and 2,500 feet. It blooms between April and September. It has been documented primarily on the eastern Central Valley floor and foothills from Visalia north. This species is threatened by agricultural, development, overgrazing, channelization, and non-native plants (CNPS 2020).

There were six CNDDDB records of this species within 10 miles of the BSA. The closest record (EONDX 55309) was approximately 7.3 miles to the northeast of the BSA and consisted of 30 plants documented in 2000 in a vernal pool. San Joaquin Valley orcutt grass was not identified in the vernal pools (VP1 through VP3) in a median between SR 99 and Fairmead Boulevard but these vernal pools provide habitat that could potentially support this species.

**Hairy orcutt grass*****ORCUTTIA PILLOSA***

Status: Federally Threatened, State Endangered, 1B.1 Species

Hairy orcutt grass is an annual herb that occurs in vernal pools at elevations from 150 to 655 feet. It blooms May to September. This species is only known from a few locations on the Central Valley floor and lower foothills in Madera, Merced, and Stanislaus counties, and the very northern portion of the valley in Butte, Glenn, and Tehama counties. It is threatened by agriculture, urbanization, overgrazing, non-native plants, and trampling (CNPS 2020).

There was one CNDDDB record of this species within 10 miles of the BSA. This record (EONDX 22330) was approximately 10 miles to the southeast of the BSA and consisted of plants documented in 1973 in a vernal pool. Hairy orcutt grass was not identified in the vernal pools (VP1 through VP3) in a median between SR 99 and Fairmead Boulevard but these vernal pools provide habitat that could potentially support this species.

**Spiny-sepaled button celery*****ERYNGIUM SPINOSEPALUM***

Status: 1B.2 Species

The spiny-sepaled button celery is an erect perennial herb growing up to about 30 inches with a thick, hairless branching stem. It occurs in valley and foothill grasslands within and around vernal pools, depressions, and grasslands with moist conditions at elevations from 260 to 900 feet. The heads bloom in white petals between April and May. This species is threatened by development, grazing, road maintenance, hydrological alterations, and agriculture (CNPS 2020).

There were 13 CNDDDB records of this species within 10 miles of the BSA. The closest record (EONDX 92236) was approximately 3.7 miles to the north of the BSA and was recorded in 2011. There is no detailed information for this record. Spiny-sepaed button celery was identified within the BSA in a dry vernal pool (VP1) in the median between SR 99 and Fairmead Boulevard (Figure 5-1). This species could also occur within the other two vernal pools (VP2 and VP3) and within the wetland (W1) along Fairmead Boulevard where moist grassland conditions occur, although it was not present at those locations during the on-site surveys.

### **5.1.2 - SPECIAL-STATUS ANIMAL SPECIES**

The literature review identified 28 special-status animal species known or with potential to occur in the vicinity of the Project (Appendix D). Of those, nine were determined to have a potential to occur within the BSA (see Table 5-1) and are discussed below.

#### **Vernal Pool Fairy Shrimp**

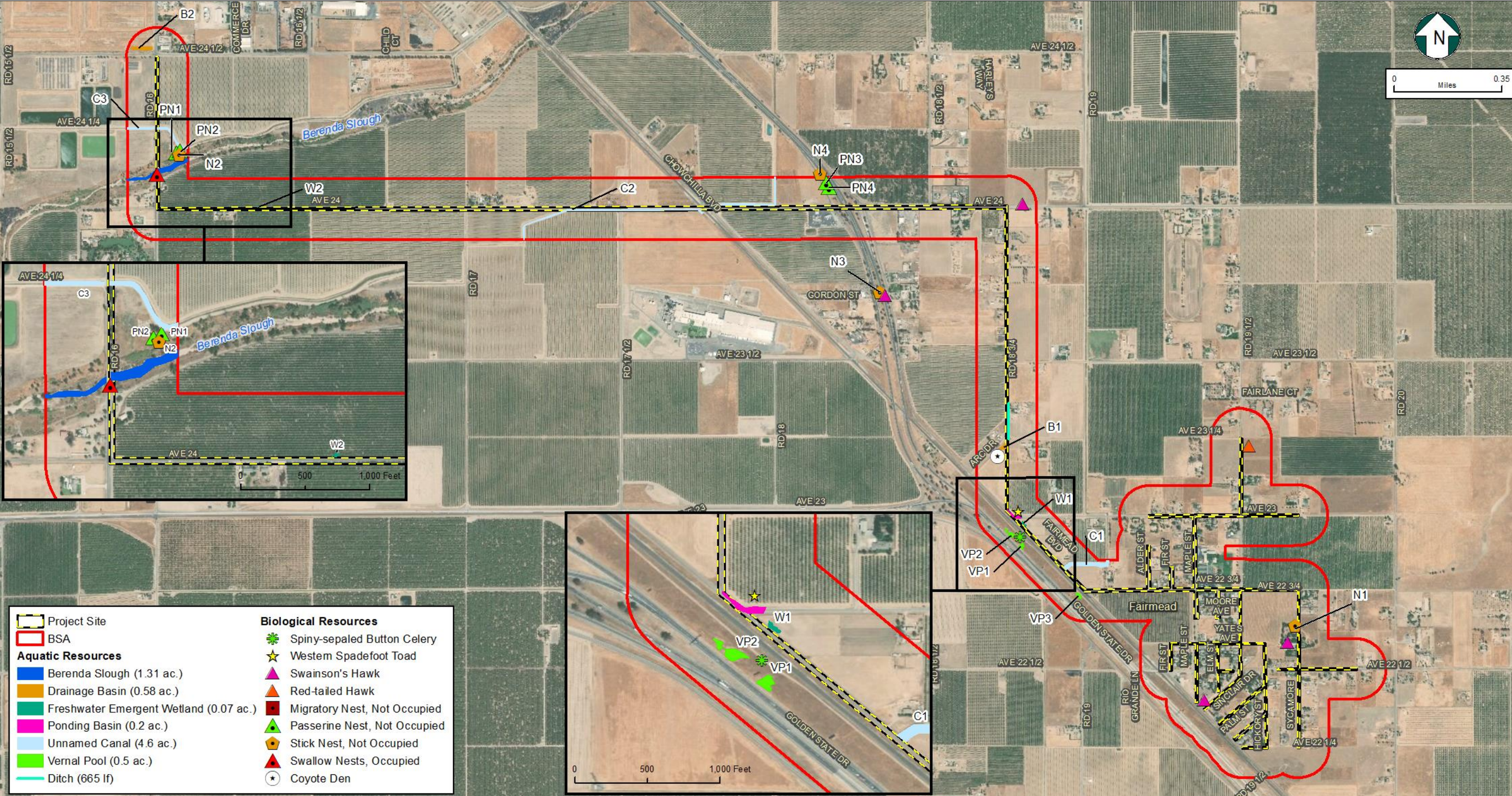
**BRANCHINECTA LYNCHI**

Status: Federally Threatened

The vernal pool fairy shrimp is a small translucent, slender crustacean that is found in ephemeral pool habitat occurring in grasslands, rock outcrops, and roadside ditches. Suitable water conditions for vernal pool fairy shrimp include a temperature range between approximately 43 degrees and 68 degrees F and with a pH averaging around 7.0 (Eng et al. 1990). Shortly after winter rains fill pool basins, the vernal pool fairy shrimp hatches from previously dormant cysts. The species matures in approximately 26 days, reproduces within 40 days, and lives about 91 days (Helm 1998).

There were 16 CNDDDB records of this species within 10 miles of the BSA. The closest record (EONDX 46111) was approximately 0.1 miles west of the BSA. The record was observed in 2001 approximately 375 feet from the intersection of Highway 99 and Road 19 within tire tracks on the east side of the lateral canal. Based on site conditions during the reconnaissance survey, one wetland (W1) approximately 10 feet east of the Project site within a grassland area along Fairmead Boulevard and three vernal pools (VP1 through VP3) within the median between SR 99 and Fairmead Boulevard could support this species (see Figure 5-1). There was no water in these features at the time of the reconnaissance survey, but this species could occur during the wet season when water is present.





**Figure 5-1**  
Occurrences of Sensitive Biological Resources within the BSA,  
Fairmead-Chowchilla Wastewater Treatment Facility Connection Project, Madera County, California





**Western Spadefoot*****SPEA HAMMONDII***

Status: State Species of Special Concern

The western spadefoot is a relatively common amphibian found throughout most of the Central Valley and adjacent foothills (Zeiner et al. 1988). The spadefoot is found in grasslands but can also be found in the valley and foothill hardwood woodlands (Zeiner et al. 1988). Shallow temporary pools are optimal habitats for breeding and egg laying. Within grassland habitats this species can be above ground during late winter or late spring when there are periods of rain or high humidity. During the dry season they are rarely above the surface and prefer to remain in burrows.

There were 23 CNDDDB records within 10 miles of the Project with the nearest record being 5.5 miles northeast of the BSA. This record (EONDX 114039) documented western spadefoots in 2009 within vernal pools. Based on site conditions during the on-site surveys, aquatic resources that were present within the BSA provide habitat that could potentially support breeding and overwintering of western spadefoot. Western spadefoots were observed in a ponding basin along Fairmead Boulevard and Avenue 22  $\frac{3}{4}$  where water was ponded along the road (see Figure 5-1). There is potential for this species to be present within aquatic features occurring within the BSA including Berenda Slough, vernal pools (VP1 through VP3), artificial basins (Basin 1 and Basin 2), freshwater emergent wetlands (W1 and W2), canal/ditches (C1 through C3), and roadside ditches.

**Western Pond Turtle*****ACTINEMYS MARMORATA***

Status: State Species of Special Concern

Western pond turtles are diurnally active and highly aquatic. They are found in ponds, lakes, rivers, streams, creeks, marshes, and irrigation ditches with vegetation and rocky/muddy bottoms (Nafis 2018, Zeiner et al. 1988). A key component of suitable habitat for this species is basking areas near water, such as logs, rocks, vegetation mats, and vegetated banks. Western pond turtles are primarily found in freshwater but may enter brackish water and even seawater. They dig nests for egg-laying on land usually within 1,200 feet of water. The species is found throughout much of California, ranging from north of the San Francisco Bay area south, including the Central Valley. Threats to the species include habitat loss, degradation, and fragmentation, particularly as aquatic habitats become developed or otherwise disturbed. Repeating drought conditions in California potentially lead to local extirpations, sometimes with little potential for natural recolonization, leading to a concern for this species continued existence in some areas.

There was one CNDDDB record within 10 miles of the Project. This record (EONDX 1893) was collected by Holland, but the date of the record is unknown. Based on site conditions during the on-site surveys, Berenda Slough could potentially provide habitat that could support this species. Given that Berenda Slough is an intermittent stream, western pond turtles would likely only be found in the slough during the months when water is present and would nest in upland habitat near the slough during the dry months. Basking structures and refugia sites

were limited within the slough, but because the slough is connected by irrigation canals and ditches to ephemeral ponds adjacent to the northwest of the BSA, there is some potential for this species to occur. No western pond turtles were observed during the surveys, but this species could occur when there is water present in Berenda Slough.

### **Giant Garter Snake**

*THAMNOPHIS GIGAS*

Status: Federally Threatened, State Threatened

The giant garter snake is found primarily in marshes, sloughs, drainage canals, and irrigation ditches, especially around rice fields, and occasionally in slow-moving creeks. It prefers locations where there is vegetation close to the water. This species overwinters in animal burrows and starts to emerge from overwintering sites in April. Females bear live young from July through early September. Some snakes are active until October. It basks on vegetation near water in spring and uses animal burrows and vegetation piles during hotter weather for temperature regulation.

There are no CNDDDB records of this species within 10 miles of the BSA. The closest CNDDDB record (EONDX 1653) is from 1986 which was approximately 28 miles to the northwest of the Project. The location of this record is connected to Berenda Slough via waterways in Mariposa Bypass Canal and Eastside Bypass Canal. Berenda Slough could potentially provide habitat that could support this species. Though there is no publicly available record of water levels and flow in Berenda Slough, the slough banks contain small mammal burrows and adequate cover to support this species. The grassy banks and openings in waterside vegetation provide space for basking and the higher elevation uplands provide habitat for cover and refuge from flood waters during the snake's dormant season in the winter. No giant garter snakes were observed during the survey, but this species could occur in Berenda Slough during the breeding season (between May 1 and October 1) if there is water present.

### **Western Burrowing Owl**

*ATHENE CUNICULARIA*

Status: State Species of Special Concern

The western burrowing owl is a small ground-dwelling owl that is found throughout western North America. This species occupies a variety of habitat types including grassland, shrub steppe, desert, natural prairie, agricultural areas (including pastures, untilled margins of cropland, and irrigation canals), earthen levees and berms, ruderal, grassy fields, pastures, coastal uplands, and urban vacant lots as well as the margins of airports, golf courses, and roads. Burrowing owls use earthen burrows, typically relying on other fossorial mammals to construct their burrows (USFWS 1998). In California, they are most often associated with California ground squirrel burrows (Winchell 1994). They use a burrow throughout the year for temperature regulation, offspring rearing, shelter, and escape from predators. While burrows are most often earthen, they have been documented using atypical burrows such as pipes, culvers, and other man-made structures, most often as shelter (Shuford and Gardali 2008). Burrowing owls can have several burrows close to one other that they may use frequently to avoid predators.



Four CNDDDB occurrences of western burrowing owl were documented within 10 miles of the Project. The nearest CNDDDB record (EONDX 47124) of this species was approximately 7 miles northwest of the BSA. There were two adult owls within remnants of Central Valley grasslands observed in 2016. Based on site conditions during the on-site surveys, the annual grassland habitat along Avenue 24 could potentially support nesting and foraging burrowing owls. The owls also could inhabit berms of the canals/ditches (C1 through C3) that transect the BSA and establish burrows within the gores of SR 99 and at the banks of the artificial basins (Basin 1 and Basin 2). One den complex with multiple entrances was found at the berm of Basin 1 along Road 18  $\frac{3}{4}$  and Arc Drive (see Figure 5-1) but there was no burrowing owl or diagnostic sign (e.g. pellets, white wash, feathers, prey remnants, etc.) identified at this den. Agricultural fields within and surrounding the BSA could also provide potential nesting and foraging habitat. No burrowing owls or diagnostic signs of this species were observed during the surveys but there is some potential for burrowing owls to be present from time to time as transient foragers or even to become established within the BSA.

### **Swainson's Hawk**

***BUTEO SWAINSONI***

Status: State Threatened

Swainson's hawks occur in grassland, desert, and agricultural landscapes in the Central Valley and Antelope Valley of California (Bechard, et al. 2010, Zeiner et al. 1990). Some hawks may be resident, especially in the southern portion of their range, while others may migrate between wintering habitat in Central and South America and breeding habitats in North America. They prefer larger isolated trees or small woodlots for nesting, usually with grassland or dry-land grain fields nearby for foraging. They have been known to nest in large eucalyptus trees along heavily traveled freeway corridors. Swainson's hawks forage in grassland, open scrub, pasture, and dryland grain agricultural habitats, primarily for rodents. Swainson's hawks exhibit a moderate to high nest site fidelity at successful nest sites.

Sixteen CNDDDB records of Swainson's hawk occurrences were documented within 10 miles of the Project. The nearest record (EONDX 91148) of this species was approximately 1.5 mile north of the BSA along Berenda Slough where a pair was observed building a nest in a cottonwood tree in 2012. Based on site conditions during the on-site surveys, nesting and foraging habitat that could support this species exist within the BSA. Riparian habitat along Berenda Slough and eucalyptus tree habitat along Avenue 24, along SR 99, and bordering the residential area of Fairmead provide suitable nesting habitat for this species. Foraging habitat occurs within annual grassland and agricultural fields within and surrounding the BSA. Three Swainson's hawks were observed within the BSA and one observation was at the intersection of SR 99 and South Chowchilla Road approximately 0.3 miles to the west of the BSA (see Figure 5-1). There were three old unoccupied stick nests found within the BSA and one unoccupied nest documented outside of the BSA approximately 0.3 miles to the west along SR 99 (see Figure 5-1).

### **Northern Harrier**

***CIRCUS HUDSONIUS***

Status: State Species of Special Concern

The northern harrier is a slender, medium-sized raptor with long, fairly broad wings and a long, rounded tail. This species occurs in a variety of habitats throughout California and forages in open wetlands, wet pastures, fallow fields, dry uplands, prairies, agricultural lands, and desert shrub-steppe utilizing open uplands including agricultural lands adjacent to foraging habitat for nesting.

There was one CNDDDB record of this species within 10 miles of the Project. This record (EONDX 101405) was approximately 6.5 miles to the northwest of the BSA and was recorded in 2015. The record is of a nesting pair occurring in a wheat field. Nesting and foraging habitat consisting of annual grassland habitat and agricultural fields could support this species within the BSA.

### **American Badger**

#### ***TAXIDEA TAXUS***

Status: State Species of Special Concern

The American badger is an uncommon permanent resident in California, except for it being absent in alpine habitats and in the northern North Coast (CDFG 1995). They can typically be found in grasslands, deserts, and drier habitats. Badgers are typically nocturnal and hunt or forage at night while spending daylight hours below ground. Normally, they have a single den entrance that is approximately eight to 12 inches in width, and elliptical or half-moon shape that is similar to their body shape. Dens are usually found in friable soils, which facilitates their construction. American badgers spend most of their time near a den, but they may frequently move between multiple dens within their home range. American badgers are known to be able to dig a new den each night. During cooler nights the entrance to the den may be partially or fully plugged with soil to help regulate temperatures. American badgers primarily feed on small mammals that they capture from digging out the prey's burrows. Such prey may include pocket gophers, mice, chipmunks, and ground squirrels (CDFG 1995). Other prey may include birds, bird eggs, reptiles, invertebrates, and carrion.

Three CNDDDB records occur within 10 miles of the Project. The closest record (EONDX 56648) was 7.5 miles to the southwest of the Project and documented two badgers in 1986. Based on site conditions during the on-site surveys, annual grassland and habitat along Berenda Slough provides denning and foraging habitat that could support this species. One den complex with multiple entrances was found at the berm of Basin 1 along Road 18  $\frac{3}{4}$  and Arc Drive (see Figure 5-1) but there was no American badger or diagnostic sign (e.g. claw marks or scat) identified at this den or anywhere else within the BSA. There is some potential for American badgers to be present from time to time as transient foragers or even to establish dens within the BSA.

### **San Joaquin Kit Fox**

#### ***VULPES MACROTIS MUTICA***

Status: Federally Endangered and State Threatened

San Joaquin kit foxes are a subspecies of kit fox that is endemic to the Central Valley of California (USFWS 1998, USFWS 2010). They are found in the San Joaquin Valley, Carrizo

Plain, Cuyama Valley, and in other small valleys in the western foothills of the Central Valley. They are only found west of the Sierra Nevada crest. They occupy arid to semi-arid grasslands, open shrublands, savannahs, and grazed lands with loose-textured soils. San Joaquin kit foxes are well-established in some urban areas and are highly adaptable to human-altered landscapes. They generally avoid intensively maintained agricultural land. San Joaquin kit foxes use subterranean dens year-round for shelter and pup-rearing. They are nocturnally active but may be visible above ground near their dens during the day, particularly in the spring. They feed primarily on small mammals, but will consume a variety of prey, and will scavenge for human food.

There was one CNDDDB record (EONDX 45340) of this species within 10 miles of the Project. That record was of one adult kit fox observed in 2001 within annual grassland. Based on site conditions during the on-site surveys, the annual grassland habitat within the BSA provides suitable denning and foraging habitat, and the surrounding urban and agricultural lands could also support the species and the foxes may pass through the BSA as transients from time to time. One den complex with multiple entrances was found at the berm of Basin 1 along Road 18  $\frac{3}{4}$  and Arc Drive (see Figure 5-1) but there was no kit fox or diagnostic sign (e.g. scat, fur, prints, or prey remnants) identified at this den or anywhere else within the BSA. There is some potential for the kit fox to occur from time to time as transient foragers or even to establish dens within the BSA.

### **5.1.3 - OTHER PROTECTED SPECIES**

#### ***Nesting Birds and Raptors***

Habitat within the BSA supports nesting native bird species, which are protected by the federal MBTA and the California Fish and Game Code. The on-site surveys were conducted at the beginning of the nesting bird season (February 1 to September 15). Seven unoccupied nests consisting of three raptor nests and four passerine nests were identified in trees within the BSA and swallow nests were present at Road 16 bridge over Berenda Slough (see Figure 5-1). Various species of migratory birds will construct nests in a variety of habitats and structures, and more nests may be constructed in trees or shrubs, man-made structures, and directly on the ground as the nesting season progresses. Because the BSA support several types of habitats suitable for nesting birds, it is likely that birds will nest within the BSA.

#### ***Bats***

Habitat within the BSA provides roosting and foraging habitat that could support special-status bat species and maternity colonies of bats which are protected during the maternity season by the California Fish and Game Code. Riparian habitat along Berenda Slough could provide day roosting habitat in eucalyptus trees, cottonwood trees, and oak trees and the Road 16 bridge over Berenda Slough could be used by night roosting bats. Swallow nests at Road 16 bridge and eucalyptus trees within the residential area of Fairmead along Avenue 24 could also provide day roosting habitat and be inhabited by bats. Signs of night roosting bats consisting of urine stains and small amount of guano were documented at and below the Road 16 bridge during the time of the surveys.

## **5.2 - Sensitive Natural Communities**

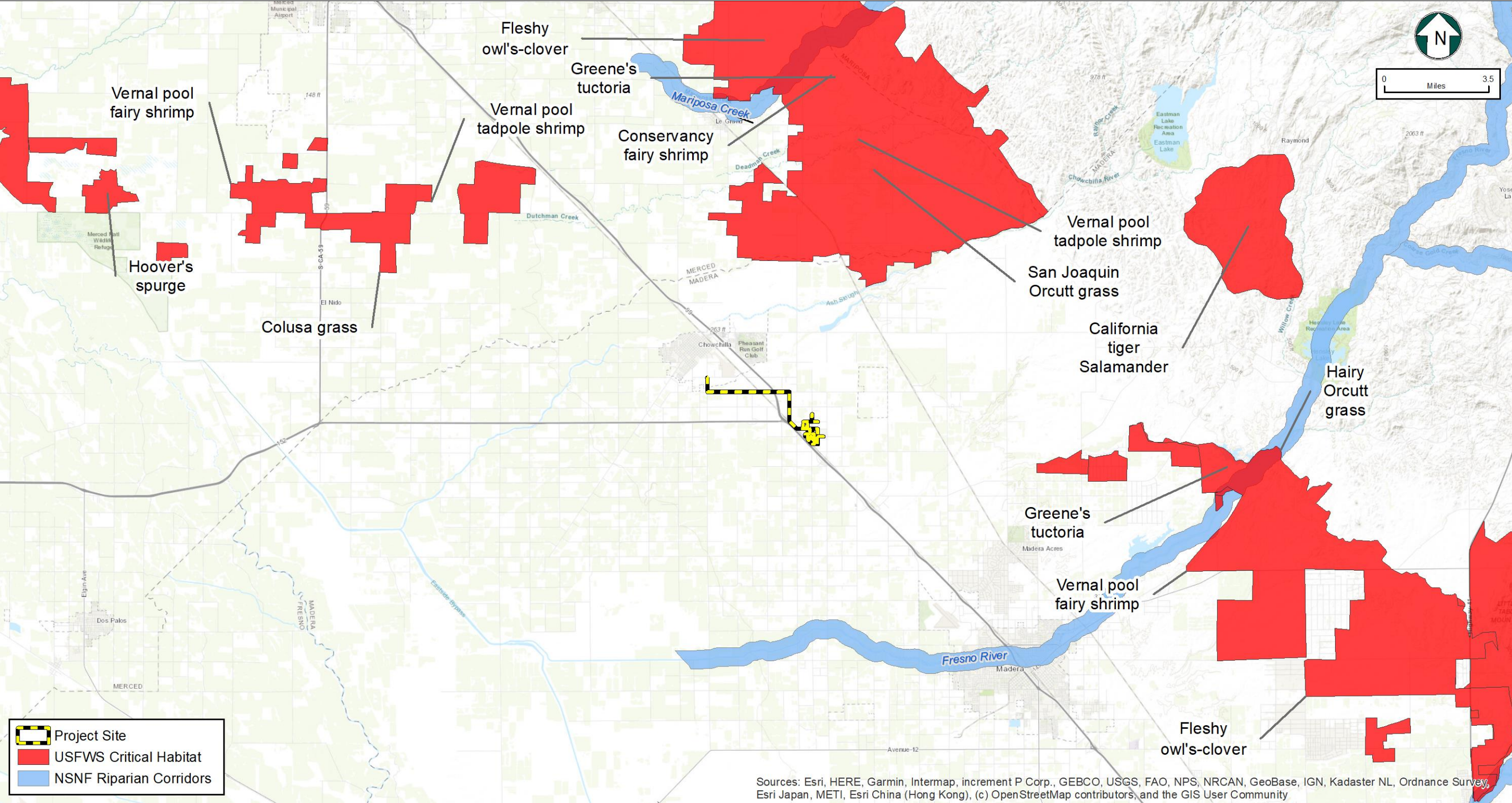
### **5.2.1 - SENSITIVE PLANT COMMUNITIES**

The database and literature review identified three sensitive plant communities, the northern hardpan vernal pool, valley sacaton grassland, and valley sink scrub within 10 miles of the BSA. A CNDDDB record of northern hardpan vernal pool was recorded approximately 3.5 miles to the north of the Project but there were no CNDDDB records of valley sacaton grassland or valley sink scrub within 10 miles of the Project (CDFW 2020a). No sensitive plant community occurs within the BSA because all lands have been regularly disturbed by agricultural and urban uses.

### **5.2.2 - CRITICAL HABITATS**

There is no critical habitat present within the BSA or in its immediate vicinity. There are designated critical habitats for several special-status species to northwest, north, northeast, east, and southeast the BSA (Figure 5-2). The closest of these is 4.8 miles to the north and consist of San Joaquin Orcutt grass and vernal pool tadpole shrimp critical habitat (Figure 5-2).





**Figure 5-2**  
**Mapped Critical Habitat and Riparian Corridors in the Project Vicinity,**  
**Fairmead Sewer Line Alignment Project, Madera County, California**



### **5.3 - Jurisdictional Aquatic Resources**

The NHD indicated one intermittent stream, the Berenda Slough, and four artificial canals/ditches that cross the BSA. Except for one canal/ditch, these features were identified and confirmed during the on-site surveys (see Figure 5-1). Berenda Slough is connected to the San Joaquin River and is a jurisdictional waterway (under the regulatory authority of the Army Corps of Engineers and Environmental Protection Agency). There was no water within the slough during the time of the survey. The other three waterways consisted of irrigation canals/ditches with maintained barren earthen berms. There was water present in these canals/ditches and no or minimal vegetation was present at the banks. These features are connected to the Eastside Bypass Canal, which drains into the San Joaquin River and therefore these features are also jurisdictional waterways. In addition to these features, the NWI identified two freshwater emergent wetlands (W1 and W2) within the BSA. These two NWI features were verified to exist within the BSA. The freshwater emergent wetland W1 was approximately 10 feet east of the Project footprint within an annual grassland habitat along Fairmead Boulevard and consisted of a depression where water collects during wet season (see Figure 5-1). There was no water present within this wetland during the time of the survey. The other wetland (W2) was in almond orchard approximately between 5 and 35 feet north of Project footprint along Avenue 24 and consisted of small depression/puddle in bare ground beneath the trees that contained some irrigation water (see Figure 5-1). These two features are isolated features with no connection to jurisdictional waterways but may be State Waters. Formal aquatic resource delineations would be required to determine the status of these features.

Several other aquatic features were identified within the BSA including three vernal pools (VP1 through VP3), two artificial basins (Basin 1 and Basin 2), one ponding basin, and one ditch (see Figure 5-1). The vernal pools were within an annual grassland habitat between SR 99 and Fairmead Boulevard, approximately 90 to 180 feet to the west of the Project footprint. The pools were degraded and there was no water present in these pools during the time of the surveys. The pools were mostly dominated by non-native vegetation with few native species including but not limited to spiny-sealed button celery in vernal pool VP1. Basin 1 is an artificial basin adjacent to the Project footprint along Road 18  $\frac{3}{4}$  and Arc Drive and Basin 2 was approximately 140 feet to the northwest of the Project footprint at the intersection of Avenue 24  $\frac{1}{2}$  and Road 16 (see Figure 5-1). Both basins contained no water and were dominated by non-native vegetation. The ponding basin at intersection of Fairmead Boulevard and Avenue 23 (see Figure 5-1) consisted of a depression in bare ground along the roadside. There was water ponding in this basin. These features are isolated features with no connection to jurisdictional waterways but may be State Waters. Formal aquatic resource delineations would be required to determine the status of these features. The ditch was approximately 15 feet east of the Project footprint along Road 18  $\frac{3}{4}$  (see Figure 5-1). This ditch contained some water and was dominated by annual grasses and non-native weedy species. Based on the results of the on-site surveys, it is not conclusive if this ditch connects to jurisdictional waterways and a formal aquatic resource delineation would be required to determine the status of this ditch.

## **5.4 - Wildlife Movement Corridors**

Wildlife movement corridors, also referred to as dispersal corridors or landscape linkages, are generally defined as linear features along which animals can travel from one habitat or resource area to another. Wildlife movement corridors can be large tracts of land that connect regionally important habitats that support wildlife in general, such as stop-over habitat that supports migrating birds or large contiguous natural habitats that support animals with very large home ranges (e.g., coyotes, mule deer [*Odocoileus hemionus californicus*]). They can also be small scale movement corridors such as riparian zones that provide connectivity and cover to support movement at a local scale. The BSA is not located within any identified wildlife movement corridors. The nearest regional wildlife movement corridor is the Fresno River, approximately 5.9 miles south of the BSA (see Figure 5-2). The riparian corridor of Berenda Slough may serve as a local movement corridor, bolstered by its connection to the Chowchilla River to the northeast of the BSA. The remaining areas within the BSA are surrounded by land used for agricultural and residential purposes, so do not serve as a connector between valuable wildlife habitat.

## **5.5 - Resources Protected by Local Policies and Ordinances**

The Project is within the area covered by the Madera County General Plan Policy Document, which contains policies aimed at preserving biological resources and promoting coordination with federal and State resource agencies (City of Madera 2009, Madera County 1995). Included within the General Plan are the goals, policies, and implementation programs focusing on protecting water resources, wetland and riparian areas, fish and wildlife habitat, vegetation, and open space for the preservation of natural resources. Details of the Madera County General Plan provisions are included in Appendix A.

### **5.5.1 - PROTECTED TREES**

There are no tree ordinances or preservation policies listed in the Madera County General Plan (City of Madera, 2009, Madera County 1995).

## **5.6 - Habitat Conservation Plans**

The Project is located within an area covered by the PG&E San Joaquin Valley Operation and Maintenance Habitat Conservation Plan (HCP). That HCP only applies to maintenance and operations of PG&E facilities and does not apply to this Project.



## **SECTION 6 - IMPACT ANALYSIS AND RECOMMENDED MITIGATION MEASURES**

This section provides an analysis of the potential for special-status biological resources to be impacted by the proposed Project. The analysis was developed using the CEQA Appendix G questions, but also provides sufficient information to support National Environmental Policy Act (NEPA) documentation.

### **6.1 - Special-Status Species**

The proposed project would have a significant effect on biological resources if it would:

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

#### **6.1.1 - PROJECT IMPACTS TO SPECIAL-STATUS PLANT SPECIES**

One special-status plant species, the spiny-sepaled button celery, is present within the BSA and three other special-status species, the succulent owl's clover, San Joaquin Valley orcutt grass, and hairy orcutt grass have potential to occur within the BSA.

##### ***Succulent Owl's Clover, San Joaquin Valley Orcutt Grass, and Hairy Orcutt Grass***

There is no evidence that succulent owl's clover, San Joaquin Valley Orcutt Grass, and hairy orcutt grass are present within the BSA but three vernal pools (VP1 through VP3) within a median between SR 99 and Fairmead Boulevard could support these species.

Project construction activities are proposed to occur mostly within existing roadways and with a minimal area of disturbance up to 20 feet either side of the road. The vernal pools (VP1 through VP3) that could potentially support these species are located to the west of Fairmead Boulevard behind train tracks that are greater than 20 feet from the proposed Project footprint. According to the current Project design plans, these vernal pools will be avoided by the construction and no impacts to those vernal pools or to succulent owl's clover, San Joaquin Valley Orcutt Grass, and hairy orcutt grass are anticipated to occur.

##### ***Spiny-sepaled Button Celery***

The spiny-sepaled button celery was identified in one dry vernal pool (VP1) in a median between SR 99 and Fairmead Boulevard, approximately 178 feet to the west of the Project footprint.

Project construction activities are proposed to occur mostly within existing roadways and with a minimal area of disturbance up to 20 feet either side of the road. The vernal pool (VP1) containing a population of spiny-sepaled button celery is located to the west of Fairmead Boulevard behind train tracks that are greater than 20 feet from the proposed Project

footprint. Potential habitat that could support this species also exists within wetland W1 which is along Fairmead Boulevard approximately 10 feet to the east of the Project footprint. According to the current Project design plans, the vernal pool (VP1) will be avoided by the construction but disturbance into wetland W1 could potentially occur. Implementation of Measure BIO-1 and BIO-2 listed below, would reduce any impacts to the species to a less than significant level.

### **6.1.2 - PROJECT IMPACTS TO SPECIAL-STATUS ANIMAL SPECIES**

Thirteen special-status wildlife species have potential to occur within the BSA: vernal pool fairy shrimp, midvalley fairy shrimp, California linderiella, western spadefoot, western pond turtle, giant garter snake, burrowing owl, Swainson's hawk, northern harrier, hoary bat, Yuma myotis, American badger, and San Joaquin kit fox.

#### **Vernal Pool Fairy Shrimp**

There is no evidence that vernal pool fairy shrimp is present within the BSA but one wetland (W1) along Fairmead Boulevard approximately 10 feet east of the Project site and three vernal pools (VP1 through VP3) within a median between SR 99 and Fairmead Boulevard could support this species during months when water is present.

Project construction activities are proposed to occur mostly within existing roadways and with a minimal area of disturbance up to 20 feet either side of the road. The vernal pools (VP1 through VP3) are more than 20 feet from the proposed Project footprint and are separated from the Project site by railroad tracks. According to the current Project design plans, these vernal pools will be avoided by the construction but disturbance to wetland W1 may occur. Because vernal pool fairy shrimp could occur in this wetland, there is potential for impacts to this species including direct mortality to individuals from ground disturbance, emergent vegetation or other riparian vegetation removal, habitat loss, and poisoning. It is recommended that the Project be designed to avoid this wetland feature. If the feature cannot be avoided, then implementation of Measure BIO-3 listed below, would reduce any impacts to vernal pool fairy shrimp to a less than significant level.

#### **Western Spadefoot**

The western spadefoot was present within the BSA along Fairmead Boulevard and Avenue 22 ¾ where water ponded along the road. Berenda Slough, vernal pools (VP1 through VP3), artificial basins (Basin 1 and Basin 2), freshwater emergent wetlands (W1 and W2), and canals/ditches provide habitat that could potentially support breeding and overwintering of western spadefoot during the months when the water is present.

Project construction activities are proposed to occur mostly within existing roadways with a minimal area of disturbance up to 20 feet either side of the road. At Berenda Slough, the pipeline would be bored beneath the slough as the preferred method to avoid disturbance to water and the surrounding riparian habitat that could support western spadefoot but it is possible that the gravity line may be tied to the underside of the Road 16 bridge over Berenda

Slough, which will be determined as design advances. At the three canals/ditches crossings, open trench methods may be utilized, but tunneling may be required if water is present.

Because of western spadefoot presence along the Fairmead Boulevard and Avenue 22  $\frac{3}{4}$  adjacent to the Project footprint, potential impacts to the western spadefoot may include direct mortality to individuals from vehicle strikes, ground disturbance, emergent vegetation or other riparian vegetation removal, habitat loss, and poisoning. Potential indirect impacts may include degradation of breeding habitat, change in water quality due to runoff from construction, loss of shelter resulting into increased predation, exposure or stress. Implementation of Measure BIO-1 and BIO-4 listed below, would reduce any impacts to the species to a less than significant level.

### **Western Pond Turtle**

There is no evidence that the western pond turtle is present within the BSA but Berenda Slough that is present within the north portion of the BSA provides habitat that could potentially support breeding and overwintering of this species during months when water is present.

Project construction activities are proposed to occur mostly within existing roadways with a minimal area of disturbance up to 20 feet either side of the road. At Berenda Slough, the pipeline would be bored beneath the slough as the preferred method to avoid disturbance to water and the surrounding riparian habitat that could support the western pond turtle but it is possible that the gravity line may be tied to the underside of the Road 16 bridge over Berenda Slough, which will be determined as design advances.

Potential impacts to this species could include direct mortality to individuals through ground disturbance, emergent vegetation or other riparian vegetation removal, vehicle strikes, habitat loss, and poisoning. Potential indirect impacts may include degradation of breeding habitat, change in water quality due to runoff from construction, loss of shelter resulting in increased predation, exposure or stress. Implementation of Measure BIO-1 and BIO-5 listed below, would reduce any impacts to the species to a less than significant level.

### **Giant Garter Snake**

There is no evidence that giant garter snake is present within the BSA. Berenda Slough that is present within the northern portion of the BSA provides habitat that could potentially support this species. Though it is unknown if the slough provides adequate water during the snake's active season (May 1 through October 1), the slough banks contain small mammal burrows and adequate cover. The grassy banks and openings in waterside vegetation provide space for basking and the higher elevation uplands provide habitat for cover and refuge from flood waters during the snake's dormant season in the winter. No giant garter snakes were observed during the surveys, but this species could occur if there is water present during the snake's activity season.

Project construction activities are proposed to occur mostly within existing roadways with a minimal area of disturbance up to 20 feet either side of the road. At Berenda Slough, the pipeline would be bored beneath the slough as the preferred method to avoid disturbance to water and the surrounding riparian habitat that could support giant garter snake but it is possible that the gravity line may be tied to the underside of the Road 16 bridge over Berenda Slough, which will be determined as design advances.

No disturbance to Berenda Slough and no impact to giant garter snake are anticipated to occur. However, if construction development would encroach into the Berenda Slough and potential garter snake habitat, there is potential for direct impacts including direct mortality to individuals that could occur through ground disturbance, crushing or destroying burrows occupied by this species, emergent vegetation or other riparian vegetation removal, vehicle strikes, habitat loss, and poisoning. Potential indirect impacts would include stress resulting from noise and vibrations from soil disturbance, and increased light. To avoid these impacts to the giant garter snake, an Incidental Take Permit (ITP) from CDFW would be required and extensive monitoring measures would need to be implemented. To avoid the need for obtaining an ITP, it is recommended that the pipeline be affixed to the bridge or that the pipeline be installed under the Berenda Slough to avoid all potential habitat. It is also recommended that a biological monitor be present during boring activities under Berenda Slough if that becomes the preferred method of pipe installation.

### **Swainson's Hawk**

The BSA contains suitable nesting and foraging habitat that could support Swainson's hawk. Riparian habitat along Berenda Slough and eucalyptus tree habitat along Avenue 24, along SR 99, and bordering the residential area of Fairmead provide suitable nesting habitat for this species. Foraging habitat occurs within annual grassland and agricultural fields within and surrounding the BSA. During the on-site surveys there were three Swainson's hawks observed within the BSA and there was one additional observation approximately 0.3 miles to the west along SR 99. There were three old unoccupied stick nests found within the BSA and another unoccupied nest was found outside of the BSA approximately 0.3 miles to the west along SR 99.

Because of the presence of Swainson's hawks in the immediate area and existence of nesting and foraging habitat within and surrounding the BSA, the potential for Swainson's hawks to nest within the BSA is high. Project construction activities are proposed to occur mostly within existing roadways with a minimal area of disturbance up to 20 feet either side of the road. If nests become actively used by Swainson's hawks within the BSA, there is a potential for direct and indirect impacts to occur to this species. Direct impacts could consist of mortality as a result of loss of young, fledging, or eggs due to destruction of nest or abandonment of nests if construction activities would occur in close proximity to a nest during the nesting season of this species (February 15 through August 31). Construction-related noise, ground vibration, fugitive dust, habitat loss and modification, introduction and spread of invasive species, or increased human activity which may result in a reduction in prey abundance and/or availability. Noise and vibration could cause physiological and/or loss of fitness in dependent young resulting from interruptions to brooding and/or feeding

schedules. Implementation of Measures BIO-6 and BIO-7 listed below would reduce impacts to this species to below significant levels.

### ***Northern Harrier***

There is no evidence that northern harrier is present within the BSA. However, annual grassland and dryland grain crops along Avenue 24, Road 18  $\frac{3}{4}$ , and residential areas of Fairmead provide suitable nesting habitat and foraging habitat for this species.

Project construction activities are proposed to occur mostly within existing roadways with a minimal area of disturbance up to 20 feet either side of the road. Implementation of Measures BIO-1 listed below would reduce any impacts to this species to below significant levels.

### ***Western Burrowing Owl***

There is no evidence that western burrowing owl is present within the BSA but annual grassland habitat along Avenue 24 could potentially support nesting and foraging burrowing owls. Burrowing owls could also inhabit an existing den at Basin 1 along Road 18  $\frac{3}{4}$  and Arc Drive, berms of the canals/ditches that transect the BSA, and burrowing owls could establish dens within the gores of SR 99. Agricultural fields within and surrounding the BSA could provide potential nesting and foraging habitat. California ground squirrel burrows suitable for burrowing owls were found within ruderal habitat between SR 99 and Fairmead Boulevard and along Road 18  $\frac{3}{4}$ . Because this species is present in the region year-round it is possible that western burrowing owls could become established within the BSA or be present from time to time as transient foragers.

Project construction activities are proposed to occur mostly within existing roadways with a minimal area of disturbance up to 20 feet either side of the road. At the three canals/ditches where the pipeline will cross those features, open trench methods may be utilized, but tunneling may be required if water is present. Potential direct impacts to burrowing owl could occur if there is an active den or transient individual within or near the area of development during the period of construction activities. Construction activities could result in crushing or destroying a den with a burrowing owl inside. Noise and vibration from the Project construction activities could alter the daily behaviors of individual owls and effect foraging activities or rearing of young. Implementation of Measure BIO-1 and BIO 8 listed below, would reduce impacts to this species to a less than significant level.

### ***San Joaquin Kit Fox***

There is no evidence that the San Joaquin kit fox is present within the BSA, but the annual grassland habitat within the BSA provides suitable denning and foraging habitat, and the surrounding urban and agricultural lands could also support the species. Because this species is highly mobile, there is some potential for the kit foxes to occur from time to time as transient foragers or even to establish a den within the BSA.

Project construction activities are proposed to occur mostly within existing roadways with a minimal area of disturbance up to 20 feet either side of the road, but impacts to this species could occur if there is an active kit fox den or transient individual within or near the area of development during the period of construction activities. Potential direct impacts resulting in injury, death, or entrapment in dens, trenches or pipes could occur if a fox occupies the construction area or travels through. Construction activities could result in crushing or destroying a den with a kit fox inside. Noise, vibration, and the presence of construction workers could alter normal behaviors, which could affect reproductive success. Loss of foraging and potential denning habitat would also be considered a direct impact. Implementation of Measure BIO-8 would reduce impacts to this species to a less than significant level.

### **American Badger**

There is no evidence that the American badger is present within the BSA, but annual grassland and riparian habitat along Berenda Slough could potentially provide denning and foraging habitat that could support this species. Because this species is highly mobile, there is some potential for the American badger to occur from time to time as transient foragers or even to establish a den within the BSA.

Project construction activities are proposed to occur mostly within existing roadways with a minimal area of disturbance up to 20 feet either side of the road, but impacts to this species could occur if there is an active badger den or transient individual within or near the area of development during the period of construction activities. Potential direct impacts resulting in injury, death, or entrapment in dens and trenches or pipes could occur if an American badger occupies the construction area or travels through. Construction activities could result in crushing or destroying a den with a badger inside. Noise, vibration, and the presence of construction workers could alter normal behaviors if badgers are present, which could affect reproductive success. Implementation of Measure BIO-8 would reduce impacts to this species to below significant levels.

### **Nesting Birds**

The BSA contains suitable habitat for a wide variety of nesting native bird species. The annual grassland habitat would support only ground-nesting species such as horned lark and western meadowlark (*Sturnella neglecta*), although other species may nest in trees, shrubs, and man-made structures in the urban and cropland habitats surrounding the Project. Swallows could nest in the bridge at the Road 16 bridge. Ground-disturbing Project activities could lead to the destruction of nests of ground-nesting birds. Construction-related vibration, noise, and dust production, and human presence could alter the normal behaviors of nesting birds in the vicinity of the Project and lead to nest failure. The Project would result in the loss of potential ground nesting and forage habitat. Increased human presence at the construction site could indirectly impact nesting native birds by deterring them from nesting or foraging in the vicinity of the Project. Implementation of Measures BIO-9 would reduce impacts to nesting bird species to below significant levels.

**Bats**

There is evidence that bats have been present within the BSA at the Road 16 bridge. Urine stains and small amount of guano at and below the Road 16 bridge suggest that the bridge was used in the past by night roosting bats. Eucalyptus trees, cottonwood trees, and oak trees could provide day roosting habitat and swallow nests on the Road 16 bridge could be occupied by solitary males. Berenda Slough, canals/ditches, and the agricultural fields within and surrounding the BSA provide a suitable foraging habitat.

Project construction activities are proposed to occur mostly within existing roadways with a minimal area of disturbance up to 20 feet either side of the road. Work at the Road 16 bridge over Berenda Slough, trimming or removal of trees along the Berenda Slough or any eucalyptus trees present along the Project route, could potentially impacts to bats. Potential direct impacts to bats could consist of injury or death caused by tree removal. Construction trucks and heavy equipment use, boring and trenching, light, construction noise, and increased human traffic could disrupt breeding activities at roosts, result in roost abandonment, or affect foraging behavior. Implementation of Measure BIO-10 would reduce any impacts to bats to a less than significant level.

**Avoidance and Minimization Measures**

The limited disturbance footprint of this Project and the short duration of activities at any given location, coupled with implementation of the avoidance and minimization listed below would reduce impacts of the Project to special-status wildlife species to level that would be less than significant. The following measures are recommended to avoid and minimize impacts to the spiny-sepaled button celery, vernal pool fairy shrimp, midvalley fairy shrimp, California linderiella, western spadefoot, western pond turtle, giant garter snake, western burrowing owl, Swainson's hawk, northern harrier, hoary bat, Yuma myotis, American badger, San Joaquin kit fox, and nesting migratory birds and raptors.

**BIO-1 Pre-activity Survey for Spiny-sepaled Button Celery, Western Spadefoot, Western Pond Turtle, Western Burrowing Owl, Northern Harrier, San Joaquin Kit Fox, American Badger, and roosting bats.** Within 14 days of the start of Project activities at any specific location where these species may occur, a pre-activity survey for spiny-sepaled button celery, western spadefoot, western pond turtle, western burrowing owl, northern harrier, hoary bat, Yuma myotis, San Joaquin kit fox, and American badger should be conducted by a qualified biologist knowledgeable in the identification of these species. Based on the timing of construction, multiple surveys of the Project site would likely be required. The pre-activity survey should include survey of: 1) Aquatic resources and grassy areas with moist conditions including the wetlands, vernal pools, artificial basins, and road ditches to determine presence of spiny-sepaled button celery, 2) Aquatic resources within the BSA including Berenda Slough, canals and ditches, emergent wetlands, vernal pools, artificial basins, road ditches, and puddles to determine presence of western spadefoot; 3) Berenda Slough to determine presence of western pond turtle, 4) Annual grassland habitat, gores along SR 99, and berms along the canals/ditches to identify presence



of burrowing owls and their burrows, 5) Annual grassland and dryland grain crops to identify presence of northern harries, 6) Annual grassland and the riparian habitat along Berenda Slough to determine presence of American badgers and their dens, 7) Annual grassland to determine presence of San Joaquin kit foxes and their dens, and 8) Eucalyptus, cottonwood, and oak trees along Berenda Slough as well as the Road 16 bridge to determine presence of roosting bats. Transects should be spaced at no greater than 30-foot intervals to obtain a 100 percent coverage of the Project site and a 250-foot buffer. Areas devoid of habitat capable of supporting these species would not require surveys. If no evidence of these special-status species is detected, no further action is required.

- BIO-2 Avoidance of Spiny-sepaled Button Celery.** If spiny-sepaled button celery is documented during the pre-activity survey within the area of Project disturbance, the species occurrences will be mapped using Geographic Information Systems (GIS) and will be avoided to the most possible extent. If the spiny-sepaled button celery cannot be avoided and needs to be removed, the designated biologists will conduct on-site monitoring to assure that a self-sustaining population of this species remains in place.
- BIO-3 Avoidance of Vernal Pool Fairy Shrimp.** Because there is potential for vernal pool fairy shrimp to occur within wetland W1 along Fairmead Boulevard, this wetland should be avoided by construction to assure no impact to these species. If avoidance is not feasible, protocol level survey following the *Survey Guidelines for the Listed Large Branchiopods* (USFWS 2015) should be conducted to determine presence/absence of this species. If vernal pool fairy shrimp is identified, an ITP or Biological Opinion (if a federal nexus exists) from USFWS would be required.
- BIO-4 Avoidance of Western Spadefoot.** Because western spadefoot was identified during the reconnaissance survey within the BSA, Environmentally Sensitive Area (ESA) fencing capable of precluding western spadefoots from entering construction areas should be installed anywhere western spadefoots are identified during the pre-construction survey conducted during implementation of Bio-1. Fencing should consist of 16-inch metal flashing or an equivalent material and should be buried 6 inches below the ground surface, extending at least 8 inches above the ground. No insecticides, herbicides, fertilizers, or other chemicals that might harm the western spadefoot should be used in the buffer zone.
- BIO-5 Avoidance of Western Pond Turtle.** If during the construction period the Berenda Slough is inundated, weekly examinations of slough should occur to determine presence of western pond turtles. If western pond turtles are found in Berenda Slough, barrier fencing should be installed between the stream and upland habitat to prevent entrance into work areas along the banks of the slough. Fencing should consist of 16-inch metal flashing or an equivalent material and should be buried 6 inches below the ground surface, extending at least 8 inches above the ground. If western pond turtles are found in upland habitat within the work area, a 100-foot buffer should be set up around nearby construction zones to prohibit turtles from

entering work areas, and turtles should be relocated to similar habitat in which they are found or in other suitable habitat (e.g., downstream) outside the 100-foot buffer.

- BIO-6 Pre-activity Surveys for Swainson's Hawk Nests.** If Project activities must occur during the nesting season (February 15 to August 31), pre-activity surveys should be conducted for Swainson's hawk nests in accordance with the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (CDFW 2020). The surveys would be conducted on and within 0.5-mile buffer of the Project. To meet the minimum level of protection for the species, surveys should be conducted during at least two survey periods.
- BIO-7 Swainson's Hawk Nest Avoidance.** If an active Swainson's hawk nest is discovered at any time within 0.5-mile of active construction, a qualified biologist should complete an assessment of the potential for current construction activities to impact the nest. The assessment would consider the type of construction activities, the location of construction relative to the nest, the visibility of construction activities from the nest location, and other existing disturbances in the area that are not related to construction activities of this Project. Based on this assessment, the biologist will determine if construction activities can proceed and the level of nest monitoring required. Construction activities should not occur within 500 feet of an active nest but depending upon conditions at the site this distance may be reduced. Full-time monitoring to evaluate the effects of construction activities on nesting Swainson's hawks may be required. The qualified biologist should have the authority to stop work if it is determined that Project construction is disturbing the nest. These buffers may need to increase depending on the sensitivity of the nesting Swainson's hawk to disturbances and at the discretion of the qualified biologist. If the biologist determines that construction cannot occur without risk of take of the species, then an ITP would need to be obtained prior to initiation of work activities.
- BIO-8 Avoidance and Minimization Measures for Western Burrowing Owl, San Joaquin Kit Fox, and American Badger.** The following avoidance and minimization measures should be implemented during all phases of the Project to reduce the potential for impact from the Project. They are modified from the *U.S. Fish and Wildlife Service Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance* (USFWS 2011).
- Project-related vehicles should observe a daytime speed limit of 20-mph throughout the site in all Project areas, except on County roads and State and federal highways.
  - All Project activities should occur during daylight hours, but if work must be conducted at night then a night-time construction speed limit of 10-mph should be established.
  - Off-road traffic outside of designated Project areas should be prohibited.

- To prevent inadvertent entrapment of kit foxes or other animals during construction of the Project, all excavated, steep-walled holes or trenches more than two feet deep should 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 should be installed.
- Before holes or trenches are filled, they should be thoroughly inspected for trapped animals. If at any time a trapped or injured kit fox is discovered, the USFWS and the CDFW should be contacted before proceeding with the work.
- In the case of trapped animals, escape ramps or structures should be installed immediately to allow the animal(s) to escape, or the USFWS and CDFW should be contacted for guidance.
- All construction pipes, culverts, or similar structures with a diameter of four inches or greater that are stored at a construction site for one or more overnight periods should be thoroughly inspected for kit foxes and burrowing owls 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 should 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.
- All food-related trash items such as wrappers, cans, bottles, and food scraps should be disposed of in securely closed containers and removed at least once a week from a construction or Project site.
- No pets, such as dogs or cats, should be permitted on the Project site.
- Project-related use of rodenticides and herbicides should be restricted.
- A representative should be appointed by the Project proponent who will be the contact source for any employee or contractor who might inadvertently kill or injure a kit fox or who finds a dead, injured or entrapped kit fox. The representative should be identified during the employee education program and their name and telephone number should be provided to the USFWS and CDFW.
- Upon completion of the Project, all areas subject to temporary ground disturbances (including storage and staging areas, temporary roads, pipeline corridors, etc.) should be recontoured if necessary, and revegetated to promote restoration of the area to pre-Project conditions. An area subject to "temporary" disturbance means any area that is disturbed during the Project, but after Project completion will not be subject to further disturbance and has the potential to be revegetated.

- Any Project personnel who are responsible for inadvertently killing or injuring one of these species should immediately report the incident to their representative. This representative should contact the CDFW (and USFWS in the case of San Joaquin kit fox) immediately in the case of a dead, injured or entrapped San Joaquin kit fox, American badger, or western burrowing owl.
- The Sacramento Fish and Wildlife office and CDFW Region 4 office should be notified in writing within three working days of the accidental death or injury to a San Joaquin kit fox during Project related activities. The CDFW should be notified in the case of accidental death to an American badger or western burrowing owl. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal and any other pertinent information.
- New sightings of San Joaquin kit fox, American badger, or western burrowing owl shall be reported to the CNDDDB. A copy of the reporting form and a topographic map clearly marked with the location of where a San Joaquin kit fox was observed should also be provided to the USFWS.

**BIO-9**

**Pre-activity Surveys for Nesting Birds.** If Project activities must occur during the nesting season (February 1 to September 15), pre-activity nesting bird surveys should be conducted within seven days prior to the start of construction at any specific construction area. The construction site plus a 250-foot buffer for songbirds and a 500-foot buffer for raptors (other than Swainson's hawk) shall be included in the survey. Multiple surveys are likely to be needed based upon the extended length of the Project, extensive habitat for nesting birds, and length of time of construction activities. If no active nests are found, no further action is required. However, existing nests may become active and new nests may be built at any time prior to and throughout the nesting season, including when construction activities are in progress. If active nests are found during the survey or at any time during construction of the Project, an avoidance buffer ranging from 50 feet to 500 feet may be required, with the avoidance buffer from any specific nest being determined by a qualified biologist. The avoidance buffer will remain in place until the biologist has determined that the young are no longer reliant on the adults or the nest. Work may occur within the avoidance buffer under the approval and guidance of the biologist, but full-time monitoring or routine monitoring may be required. The biologist should have the ability to stop construction if nesting adults show any sign of distress.

**BIO-10**

**Avoidance and Minimization Measures for Bats.** If sign of day roosting bats is identified within the BSA during the pre-activity survey, a follow up flyout examination of the potential roost should be conducted at dusk. If roosting bats are found to be present, then acoustical sampling should be conducted to determine species. If it is determined that night roosting bats are present, then construction activities would be limited to day work only. If day roosting bats are determined to be present, bats would be excluded from the roosting site by

installing exclusion devices. Exclusion devices would only be installed at night while bats are away from the roost. If the day roosting bats are identified as special-status species, then an exclusion plan will be prepared and approved by CDFW prior to initiating bat exclusions. If a maternity colony is present, then construction activities will be delayed until the colony has dispersed.

## **6.2 - Sensitive Natural Communities and Critical Habitat**

The proposed project would have a significant effect on biological resources if it would:

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

The BSA does not support any sensitive natural communities and does not overlap critical habitat. Therefore, the Project would have no impacts to sensitive natural communities and no measures are warranted.

## **6.3 - Jurisdictional Aquatic Resources**

The proposed project would have a significant effect on biological resources if it would:

- 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.*

The Project intersects one intermittent stream feature, Berenda Slough, and three irrigation canals/ditches (C1 through C3). An approved jurisdictional determination of the slough and the canals/ditches has not been completed, but because all these features are connected to a Traditional Navigable Water, the San Joaquin River, they likely fall under the jurisdiction of the USACE through Section 404 of the Clean Water Act as “Waters of the U.S.” Berenda Slough and the canals/ditches also fall under the jurisdiction of the RWQCB’s 401 Water Quality Certification program through Section 401 of the Clean Water Act and the CDFW through Section 1602 of the California Fish and Game Code.

Two wetlands (W1 and W2), three vernal pools (VP1 through VP3), and two Basins (Basin 1 and Basin 2) that are present within the BSA were determined not to be connected to a Traditional Navigable Water and therefore, do not fall under the jurisdiction of the USACE through Clean Water Act Section 404 as “Waters of the U.S.” An aquatic resource delineation will be required to determine jurisdiction under Section 401 of the Clean Water Act and Section 1602 of the Fish and Game Code. Aquatic resources delineation of the ditch along Road 18 ¾ (see Figure 5-1) will be required to determine jurisdiction of the USACE through Clean Water Act Section 404 as “Waters of the U.S.” and under Section 401 of the Clean Water Act and Section 1602 of the Fish and Game Code.

Project construction activities are proposed to occur mostly within existing roadways with a minimal area of disturbance up to 20 feet on either side of the road. Wetland W1 along Fairmead Boulevard is located within 20 feet of the Project footprint and may be affected by the Project development. At Berenda Slough, the pipeline would be bored beneath the slough as the preferred method to avoid disturbance to this feature and the surrounding riparian habitat, but it is possible that the gravity line may be tied to the underside of the Road 16 bridge over Berenda Slough, which will be determined as design advances. At the three canals/ditches crossings, open trench methods may be utilized, but tunneling may be required if water is present.

Depending on the final Project designs, potential impacts to aquatic resources may occur. The exact footprint of the impact will be determined after an aquatic resource delineation is completed and Project design plans are finalized. Permanent and temporary impacts to Berenda Slough and surrounding riparian habitat and canals/ditches may occur if open trenching for replacement of the sewer line is conducted. If the final design of the Project is will impact any identified wetland resource, the following mitigation measures will be implemented.

**BIO-11      Avoidance and Minimization Measures for Aquatic Resources.** All aquatic resources will be avoided to the maximum extent possible. Once the final design of Project facilities are available, all aquatic resources determined to be unavoidably impacted by Project activities will be evaluated using standard wetland delineation measures required by the USACE. Depending upon the type of feature and the jurisdictional authority over each feature, permits from the USACE, RWQCB, and CDFW for impacts to aquatic resources may need to be acquired. Unavoidable impacts to aquatic resources will be compensated at a ratio determined by the appropriate regulatory entity, and compensation will be provided by utilizing an in-leu fee program or purchase of in-kind compensatory credits at an approved mitigation bank.

## **6.4 - Wildlife Movement**

The proposed project would have a significant effect on biological resources if it would:

- d) Interfere substantially with the movement of any resident or migratory fish or wildlife species or with established resident or migratory wildlife corridors or impede the use of wildlife nursery sites.*

The proposed Project is not located within mapped regional major wildlife movement corridor or linkage but Berenda Slough riparian corridor serves as a locally important movement corridor for wildlife moving to and from the Chowchilla River. The proposed Project could be disruptive to wildlife moving through the area when construction is occurring. However, this disruption is likely to be minimized by the short duration of the Project in this area. Furthermore, no permanent barriers to wildlife movement are anticipated to be installed by the Project. Based on this, impacts to wildlife movement would be less than significant.

The proposed Project site is not a known major wildlife nursery site but does support bird nesting. Construction activities during breeding seasons could result in impacts if Project activities disrupt normal behaviors leading to the injury or death of young.

### **6.5 - Local Policies and Ordinances**

The proposed project would have a significant effect on biological resources if it would:

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

The proposed Project does not conflict with the Madera County General Plan. There are no impacts with respect to local policies and ordinances and no measures are warranted.

### **6.6 - Adopted or Approved Plans**

The proposed project would have a significant effect on biological resources if it would:

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

The Project is located within an area covered by the PG&E San Joaquin Valley Operation and Maintenance HCP. This HCP applies only to PG&E's activities and does not apply to this Project.



## **SECTION 7 - LIMITATIONS, ASSUMPTIONS, AND USE RELIANCE**

This Biological Analysis Report has been performed in accordance with professionally accepted biological investigation practices conducted at this time and in this geographic area. The findings and opinions conveyed in this report are based on findings derived from site reconnaissance, jurisdictional areas, and specified historical and literature sources. The biological investigation is limited by the scope of work performed. Reconnaissance biological surveys for certain taxa may have been conducted as part of this assessment but were not performed during a particular blooming period or particular portion of the season when positive identification would be expected if present, and therefore, cannot be considered definitive. The biological surveys are limited also by the environmental conditions present at the time of the surveys. In addition, general biological (or protocol) surveys do not guarantee that the organisms are not present and will not be discovered in the future within the site. In particular, mobile animal species could occupy the site on a transient basis or re-establish populations in the future. No other guarantees or warranties, expressed or implied, are provided.

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## **APPENDIX A**

### **REGULATORY SETTING**

## ***Regulatory Setting***

### ***Federal Laws and Regulations***

#### ***FEDERAL ENDANGERED SPECIES ACT OF 1973 (USC, TITLE 16, SECTIONS 1531 -1543)***

The federal Endangered Species Act (FESA) and subsequent amendments provide guidance for the conservation of endangered and threatened species and the ecosystems upon which they depend. The FESA defines species as threatened or endangered and provides regulatory protection for listed species. The FESA provides a program for the conservation and recovery of threatened and endangered species as well as the protection of designated critical habitat that USFWS determines is required for the survival and recovery of listed species.

Section 9 lists actions that are prohibited under the FESA. Although take of a listed species is prohibited, it is allowed when it is incidental to an otherwise legal activity. Section 9 prohibits take of listed species of fish, wildlife, and plants without special exemption. The definition of “harm” includes significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns related to breeding, feeding, or shelter. “Harass” is defined as actions that create the likelihood of injury to listed species by disrupting normal behavioral patterns related to breeding, feeding, and shelter significantly.

Section 7 of the FESA requires federal agencies, in consultation with and assistance from the Secretary of the Interior or the Secretary of Commerce, as appropriate, to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of threatened or endangered species or result in the destruction of adverse modification of critical habitat for these species. The USFWS and National Marine Fisheries Service (NMFS) share responsibilities for administering the FESA. Regulations governing interagency cooperation under Section 7 are found in California Code of Regulations (CCR) Title 50, Part 402. If an activity could result in "take" of a listed species as an incident of an otherwise lawful activity, then a biological opinion can be issued with an incidental take statement that exempts the activity from FESA's take prohibitions.

Section 10 provides a means whereby a nonfederal action with the potential to result in take of a listed species can be allowed under an incidental take permit. Application procedures are found at CFR Title 50, Sections 13 and 17 for species under the jurisdiction of USFWS and CFR, Title 50, Sections 217, 220, and 222 for species under the jurisdiction of NMFS. Section 10 would apply to the Project if take of a species (as defined in Section 9) were determined to occur.

Section 4(a)(3) and (b)(2) of the FESA requires the designation of critical habitat to the maximum extent possible and prudent based on the best available scientific data and after considering the economic impacts of any designations. Critical habitat is defined in section 3(5)(A) of the FESA: 1) areas within the geographic range of a species that are occupied by individuals of that species and contain the primary constituent elements (physical and biological features) essential to the conservation of the species, thus warranting special

management consideration or protection; and 2) areas outside of the geographic range of a species at the time of listing but that are considered essential to the conservation of the species.

### ***MIGRATORY BIRD TREATY ACT (USC, TITLE 16, SECTIONS 703 - 711)***

The MBTA, first enacted in 1918, is a series of treaties that the United State has with Great Britain (on behalf of Canada), Mexico, Japan, and the former Soviet Union that provide for international migratory bird protection. The MBTA authorizes the Secretary of the Interior to regulate the taking of migratory birds. The act provides that it shall be unlawful, except as permitted by regulations, “to pursue, take, or kill any migratory bird, or any part, nest or egg of any such bird” (U.S. Code Title 16, Section 703). The MBTA currently includes several hundred species and includes all native birds.

### ***BALD AND GOLDEN EAGLE PROTECTION ACT OF 1940 (USC, TITLE 16, SECTION 668)***

The Bald and Golden Eagle Protection Act (BGEPA) of 1940 protects bald eagles (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*) by prohibiting the taking, possession, and commerce of these species and established civil penalties for violation of this act. Take of bald and golden eagles includes to “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb.” To disturb means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior. (Federal Register [FR], volume 72, page 31132; 50 CFR 22.3).

### ***FEDERAL CLEAN WATER ACT (USC, TITLE 33, SECTIONS 1521 - 1376)***

The Federal Clean Water Act (CWA) provides guidance for the restoration and maintenance of the chemical, physical, and biological integrity of the nation’s waters. Section 401 requires that a Project applicant that is pursuing a federal license or permit allowing a discharge to waters of the U.S. to obtain State Certification of Water Quality, thereby ensuring that the discharge will comply with provisions of the CWA. The Regional Water Quality Control Board (RWQCB) administers the certification program in California. Section 402 establishes a permitting system for the discharge of any pollutant (except dredged or fill material) into waters of the U.S. Section 404 establishes a permit program administered by the USACE that regulates the discharge of the dredged or fill material into waters of the U.S., including wetlands. The USACE implementing regulations are found in CFR, Title 33, Sections 320 and 330. Guidelines for implementation are referred to as the Section 404(b)(1) Guidelines, which were developed by the United States Environmental Protection Agency (EPA) in conjunction with USACE (40 CFR 230). The guidelines allow the discharge of dredged or fill material into the aquatic system only if there is no practicable alternative that would have less adverse impacts.



## ***Applicable State Laws and Regulations***

### ***CALIFORNIA ENVIRONMENTAL QUALITY ACT (CALIFORNIA PUBLIC RESOURCES CODE, SECTIONS 21000 - 21178, AND TITLE 14 CCR, SECTION 753, AND CHAPTER 3, SECTIONS 15000 - 15387)***

The California Environmental Quality Act (CEQA) is California's broadest environmental law. CEQA helps guide the issuance of permits and approval of projects. Courts have interpreted CEQA to afford the fullest protection of the environment within the reasonable scope of the statutes. CEQA applies to all discretionary projects proposed to be conducted or approved by a State, County, or City agency, including private projects requiring discretionary government approval.

The purpose of CEQA is to disclose to the public the significant environmental effects of a proposed discretionary project; prevent or minimize damage to the environment through development of project alternatives, mitigation measures, and mitigation monitoring; disclose to the public the agency decision making process to approve discretionary projects; enhance public participation in the environmental review process; and improve interagency coordination.

State CEQA Guidelines Section 15380(b) provides that a species not listed on the federal or State list of protected species nonetheless may be considered rare or endangered for purposes of CEQA if the species can be shown to meet certain specified criteria. These criteria have been modeled after the definition in FESA and the section of the California Fish and Game Code dealing with rare or endangered plants or animals.

### ***CALIFORNIA ENDANGERED SPECIES ACT (CALIFORNIA FISH AND GAME CODE SECTION 2050 ET SEQ.)***

The California Endangered Species Act (CESA) establishes the policy of the State to conserve, protect, restore, and enhance threatened or endangered species and their habitats. The CESA mandates that State agencies should not approve Projects that would jeopardize the continued existence of threatened or endangered species if reasonable and prudent alternatives are available that would avoid jeopardy. For Projects that would result in take of a species listed under the CESA, a project proponent would need to obtain a take permit under Section 2081(b). Alternatively, the CDFW has the option of issuing a Consistency Determination (Section 2080.1) for Projects that would affect a species listed under both the CESA and the FESA, as long as compliance with the FESA would satisfy the “fully mitigate” standard of CESA, and other applicable conditions.

### ***PORTER-COLOGNE WATER QUALITY CONTROL ACT***

Under Section 401 of the CWA, the RWQCB must certify that actions receiving authorization under Section 404 of the CWA also meet State water quality standards. The RWQCB regulates waters of the State under the authority of the Porter-Cologne Water Quality Control Act (Porter Cologne Act). The RWQCB requires Projects to avoid impacts to wetlands whenever feasible and requires that Projects do not result in a net loss of wetland acreage or a net loss

of wetland function and values. The RWQCB typically requires compensatory mitigation for impacts to wetlands and/or waters of the State. The RWQCB has jurisdiction over waters deemed 'isolated' or not subject to Section 404 jurisdiction under the Solid Waste Agency of Northern Cook County (SWANCC) decision. Dredging, filling, or excavation of isolated waters constitutes a discharge of waste into waters of the State, and such discharges are authorized through an Order of Waste Discharge (or waiver of discharge) from the RWQCB.

## ***VARIOUS SECTIONS OF THE CALIFORNIA STATE AND FISH AND GAME CODE***

### ***Section 460 and Sections 4000-4003***

Chapter 5 of the California Fish and Game Code (FGC) describes regulations concerning the take of furbearing mammals, including defining methods of take, seasons of take, bag and possession limits, and areas of the State where take is allowed. Section 4000-4003 defines furbearing mammals, and the issuance of permits by the Department. Sections 460 and 4000 identifies fisher, marten, river otter, desert kit fox and red fox as furbearing mammals, and Section 460 prohibits take of these species at any time. This section of the California Fish and Game Code (FGC) has historically been interpreted to apply to restriction on furbearer trapping permit but has recently been expanded by CDFW to apply to any forms of take and treated as if these species were listed under CESA.

### ***Sections 1600 through 1616***

Under these sections of the FGC, a Project operator is required to notify CDFW prior to any Project that would divert, obstruct, or change the natural flow, bed, channel, or bank of any river, stream, or lake. Pursuant to the California Code of Regulations, a "stream" is defined as a body of water that flows at least periodically, or intermittently, through a bed or channel having banks and supporting fish or other aquatic life. Based on this definition, a watercourse with surface or subsurface flows that supports or has supported riparian vegetation is a stream and is subject to CDFW jurisdiction. Altered or artificial watercourses valuable to fish and wildlife are subject to CDFW jurisdiction. CDFW also has jurisdiction over dry washes that carry water during storm events. Preliminary notification and Project review generally occur during the environmental process. When an existing fish or wildlife resource may be substantially adversely affected, CDFW is required to propose reasonable Project changes to protect the resource. These modifications are formalized in a Streambed Alteration Agreement.

### ***Sections 3511, 4700, 5050, and 5515***

The protection of fully protected species are described in Sections 3511, 4700, 5050, and 5515 of the FGC. These statutes prohibit take or possession of fully protected species. CDFW is unable to authorize incidental take of fully protected species, except as allowed for in an approved Natural Communities Conservation Plan (NCCP), or through direct legislative action.

## **Sections 1900 through 1913 - Native Plant Protection Act**

California's Native Plant Protection Act (NPPA) requires all State agencies to use their authority to carry out programs to conserve endangered and rare native plants. Provision of the NPPA prohibit that taking of listed plants from the wild and require notification of CDFW at least ten days in advance of any change in land use. This allows CDFW to salvage listed plant species that otherwise would be destroyed. A Project proponent is required to conduct botanical inventories and consult with CDFW during Project planning to comply with the provisions of this act and sections of CEQA that apply to rare or endangered plants.

## **Local and Regional Laws, Regulations, and Policies**

### **MADERA COUNTY GENERAL PLAN**

Madera County General Plan includes goals, policies, and implementation programs for preservation of natural resources including riparian areas, fish and wildlife habitat, and vegetation. The goal of the plan is to:

- To expand the capacity of local government to analyze local and regional conditions and needs in order to respond effectively to the problems and opportunities facing the community;
- To define the community's environmental, social, and economic goals;
- To record the local government's policies and standards for the maintenance and improvement of existing development and the location and characteristics of future development;
- To provide citizens with information about their community and with opportunities to participate in setting goals and determining policies and standards for the community's development;
- To foster the coordination of community development and environmental protection activities among local, regional, state, and federal agencies;
- To guide and coordinate the many actions and day-to-day decisions of local government that are necessary to developing and protecting the community; and
- To provide local decision-makers and the community with a forum for resolving conflicts among competing interests and values.

**Table A-1**  
**Madera County General Plan Land Use, Natural Resources Policy Excerpts**

<b>Resources &amp; Policy Number</b>	<b>Goal and Policy Description</b>
Forest	Goal: To conserve Madera County's forest resources, enhance the quality and diversity of forest ecosystems, reduce conflicts between forestry and other uses, and encourage a sustained yield of forest products.
5.B.1.	The County shall encourage the sustained productive use of forest land as a means of providing open space and conserving other natural resources.
5.B.2.	The County shall discourage development that conflicts with timberland management.

<b>Resources &amp; Policy Number</b>	<b>Goal and Policy Description</b>
5.B.3.	The County shall work closely and coordinate with agencies involved in the regulation of timber harvest operations to ensure that County conservation goals are achieved.
5.B.4.	The County shall encourage qualified landowners to enroll in the Timberland Production Zone (TPZ) program.
5.B.5.	The County shall encourage and promote the productive use of wood waste generated in the county.
5.B.6.	The County shall encourage and support conservation programs to reforest private timberlands.
Water Resources	Goal: To protect and enhance the natural qualities of Madera County's streams, creeks and groundwater.
5.C.1.	The County shall protect preserve areas with prime percolation capabilities and minimize placement of potential sources of pollution in such areas.
5.C.2.	The County shall minimize sedimentation and erosion through control of grading, cutting of trees, removal of vegetation, placement of roads and bridges, and use of off-road vehicles. The County shall discourage grading activities during the rainy season, unless adequately mitigated, to avoid sedimentation of creeks and damage to riparian habitat.
5.C.3.	The County shall require new development of facilities near rivers, creeks, reservoirs, or substantial aquifer recharge areas to mitigate any potential impacts of release of pollutants in flood waters, flowing river, stream, creek, or reservoir waters.
5.C.4.	The County shall require the use of feasible and practical best management practices (BMPs) to protect streams from the adverse effects of construction activities and shall encourage the urban storm drainage systems and agricultural activities to use BMPs.
5.C.5.	The County shall approve only wastewater disposal facilities that will not contaminate groundwater or surface water.
5.C.6.	The County shall require that natural watercourses are integrated into new development in such a way that they are accessible to the public and provide a positive visual element.
5.C.7.	The County shall protect groundwater resources from contamination and further overdraft by encouraging water conservation efforts and supporting the use of surface water for urban and agricultural uses wherever feasible.
5.C.8.	The County shall support the policies of the San Joaquin River Parkway Plan to protect the San Joaquin River as an aquatic habitat and a water source.
Wetland and Riparian Areas	Goal: To protect wetland communities and related riparian areas throughout Madera County as valuable resources.
5.D.1.	The County shall comply with the wetlands policies of the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, and the California Department of Fish and Game. Coordination with these agencies at all levels of project review shall continue to ensure that appropriate mitigation measures and the concerns of these agencies are adequately addressed.
5.D.2.	The County shall require new development to mitigate wetland loss in both regulated and non-regulated wetlands through any combination of avoidance, minimization, or compensation. The County shall support mitigation banking programs that can provide the opportunity to mitigate impacts to rare, threatened, and endangered species and/or the habitat which supports these species in wetland and riparian areas.
5.D.3.	Development should be designed in such a manner that pollutants and siltation will not significantly adversely affect the value or function of wetlands.
5.D.4.	The County shall require riparian protection zones around natural watercourses. Riparian protection zones shall include the bed and bank of both low and high flow

Resources & Policy Number	Goal and Policy Description
	channels and associated riparian vegetation, the band of riparian vegetation outside the high flow channel, and buffers of 100 feet in width as measured from the top of bank of unvegetated channels and 50 feet in width as measured from the outer edge for the canopy of riparian vegetation. Exceptions may be made in existing developed areas where existing development and lots are located within the setback areas.
5.D.5.	The County shall strive to identify and conserve remaining upland habitat areas adjacent to wetlands and riparian areas that are critical to the feeding or nesting of wildlife species associated with these wetland and riparian areas.
5.D.6.	The County shall require new private or public developments to preserve and enhance existing native riparian habitat unless public safety concerns require removal of habitat for flood control or other public purposes. In cases where new private or public development results in modification or destruction of riparian habitat for purposes of flood control, the developers shall be responsible for creating new riparian habitats within or near the project area at a ratio of three acres of new habitat for every acre destroyed.
5.D.7.	The County shall support the management of wetland and riparian plant communities for passive recreation, groundwater recharge, nutrient catchment, and wildlife habitats. Such communities shall be restored, where possible.
5.D.8.	The County shall support the goals and policies of the San Joaquin River Parkway Plan to preserve existing habitat and maintain, enhance, or restore native vegetation to provide essentially continuous riparian and upland habitat for wildlife along the river between Friant Dam and the Highway 145 crossing.
Fish and Wildlife Habitat	Goal: To protect, restore, and enhance habitats that support fish and wildlife species so as to maintain populations at viable levels.
5.E.1.	The County shall identify and protect critical nesting and foraging areas, important spawning grounds, migratory routes, waterfowl resting areas, oak woodlands, wildlife movement corridors, and other unique wildlife habitats critical to protecting and sustaining wildlife populations.
5.E.2.	The County shall require development in areas known to have particular value for wildlife to be carefully planned and, where possible, located so that the reasonable value of the habitat for wildlife is maintained.
5.E.3.	The County shall encourage private landowners to adopt sound wildlife habitat management practices, as recommended by the California Department of Fish and Game officials and the U.S. Fish and Wildlife Service.
5.E.4.	The County shall support preservation of the habitats of rare, threatened, endangered, and/or other special status species. The County shall consider developing a formal habitat conservation plan in consultation with federal and state agencies, as well as other resource conservation organizations. Such a plan would provide a mechanism for the acquisition and management of lands supported by threatened and endangered species.
5.E.5.	The County shall support the maintenance of suitable habitats for all indigenous species of wildlife through maintenance of habitat diversity.
5.E.6.	The County shall ensure the conservation of sufficiently large, continuous expanses of native vegetation to provide suitable habitat for maintaining abundant and diverse wildlife, if this preservation does not threaten the economic well-being of the county.
5.E.7.	The County shall support the preservation or reestablishment of fisheries in the rivers and streams within the county, whenever possible.
5.E.8.	The County shall ensure close monitoring of pesticide use in areas adjacent to habitats of special status plants and animals.
5.E.9.	The County shall promote effective methods of ground squirrel control on croplands bordering sensitive habitat that do not place kit foxes and other special-status species at risk.

Resources & Policy Number	Goal and Policy Description
5.E.10.	Prior to approval of discretionary development permits involving parcels within a significant ecological resource area, the County shall require, as part of the environmental review process, a biotic resources evaluation of the sites by a qualified biologist. The evaluation shall be based upon field reconnaissance performed at the appropriate time of year to determine the presence or absence of rare, threatened, or endangered species of plants or animals. Such evaluation will consider the potential for significant impact on these resources and will either identify feasible measures to mitigate such impacts or indicate why mitigation is not feasible.
5.E.11.	The County shall provide for a minimum 200-foot wildlife corridor along the San Joaquin River between Friant Dam and the Highway 145 crossing, consistent with the San Joaquin River Parkway Plan. The County shall require a buffer with a minimum width of 150 feet between existing or planned urban or suburban uses. Exceptions may be necessary where the minimum width is infeasible due to topography or other physical constraints. In these instances, an offsetting expansion on the opposite side of the river should be provided.
Vegetation	Goal: To preserve and protect the valuable vegetation resources of Madera County.
5.F.1.	The County shall encourage landowners and developers to preserve the integrity of existing terrain and natural vegetation in visually sensitive areas such as hillsides, ridges, and along important transportation corridors.
5.F.2.	The County shall require developers to use native and compatible non-native species, especially drought-resistant species, to the extent possible in fulfilling landscaping requirements imposed as conditions of discretionary permit approval or for project mitigation.
5.F.3.	The County shall support the preservation of outstanding areas of natural vegetation, including, but not limited to, oak woodlands, riparian areas, and vernal pools.
5.F.4.	The County shall ensure that landmark trees are preserved and protected.
5.F.5.	The County shall establish procedures for identifying and preserving rare, threatened, and endangered plant species that may be adversely affected by public or private development projects. The County shall consider developing a formal habitat conservation plan in consultation with federal and state agencies, as well as other resources conservation organizations. Such a plan would provide a mechanism for the acquisition and management of land supporting threatened and endangered species.
5.F.6.	The County shall require that new development preserve natural woodlands to the maximum extent possible.
5.F.7.	The County shall require that development on hillsides be limited to maintain valuable natural vegetation, especially forests and open grasslands, and to control erosion.
5.F.8.	The County shall support the continued use of prescribed burning to mimic the effects of natural fires to reduce fuel volumes and associated fire hazard to human residents and to enhance the health of biotic communities.

*Source: Madera County (2009)*

## **APPENDIX B**

### **REPRESENTATIVE PHOTOGRAPHS**





**Photograph 1:** The view of the road at the intersection of Road 16 and Avenue 24 ½ at the northwest terminus of the Project site (37.105464, -120.256668, looking south).  
Photograph taken by Lisa Sandoval on April 8, 2020.



**Photograph 2:** The view of the grassy area and trees southeast of the canal/ditch located north of Berenda Slough intersection where the Swainson's hawk was observed flying and landing on a eucalyptus tree (37.102132, -120.256837, looking southeast).  
Photograph taken by Lisa Sandoval on April 8, 2020.





**Photograph 3:** The view of the bridge over Berenda Slough  
(37.099677, -120.256899, looking northeast).  
Photograph taken by Dylan Ayers on April 15, 2020.



**Photograph 4:** The view of the road and residences where the western section turns east  
(37.098335, -120.256636, looking north). Photograph taken by Lisa Sandoval on April 8, 2020.





**Photograph 5:** The view of the road and almond orchards at the intersection where the western section turns east (37.098335, -120.256636, looking east). Photograph taken by Lisa Sandoval on April 8, 2020.



**Photograph 6:** The view of the section of Ave 24, canal/ditch, and fields once the almond orchards stop, continuing the linear western strip of the Project site (37.105464, -120.256668, looking east).  
Photograph taken by Lisa Sandoval on April 8, 2020.



**Photograph 7:** The view of the oat field and gas station at the on and off ramps of Avenue 24 and SR 99 (37.098302, -120.217758, looking east). Photograph taken by Lisa Sandoval on April 8, 2020.



**Photograph 8:** The view of the road and rural residences where the linear section turns south (37.098204, -120.206769, looking south). Photograph taken by Lisa Sandoval on April 7, 2020.





**Photograph 9:** The view of Fairmead Road where the road turns southeast, following SR 99, going towards the town of Fairmead (37.083705, -120.206628, looking southeast).  
Photograph taken by Lisa Sandoval April 7, 2020.



**Photograph 10:** The view of the residential areas in Fairmead (37.077661, -120.195688, looking south). Photograph taken by Lisa Sandoval on April 7, 2020.



**Photograph 11:** The view of the field where the new line will be installed through non-native grasslands (37.080125, -120.192954, looking southeast). Photograph taken by Lisa Sandoval on April 7, 2020.



**Photograph 12:** The view of the south end of the Project site (37.072782, -120.189715, looking west). Photograph taken by Lisa Sandoval on April 8, 2020.





**Photograph 13:** The view from the east side of the Project site (37.105464, -120.256668, looking west).  
Photograph taken by Lisa Sandoval on April 8, 2020.



**Photograph 14:** The view of the canal/ditch north of the Berenda Slough (37.102132, -120.256837, looking east). Photograph taken by Lisa Sandoval on April 8, 2020.





**Photograph 15:** The view of the canal/ditch along Avenue 24 (37.105464, -120.256668, looking east). Photograph taken by Lisa Sandoval on April 8, 2020.



**Photograph 16:** The view of the canal/ditch at Fairmead Boulevard (37.081258, - 120.2030005, looking northeast). Photograph taken by Lisa Sandoval on April 8, 2020.





**Photograph 17:** Freshwater emergent wetland along Fairmead Boulevard (37.083160, - 120.205759, looking north). Photograph taken by Lisa Sandoval on April 30, 2020.



**Photograph 18:** Freshwater emergent wetland along Avenue 24 (37.098377, - 120.250572, looking west). Photograph taken by Lisa Sandoval on April 30, 2020.





**Photograph 19:** Ponding area along the road at intersection of Fairmead Boulevard and Avenue 23 where western spadefoots were documented (37.083666, -120.206073, looking west).  
Photograph taken by Lisa Sandoval on April 30, 2020.



**Photograph 20:** Western spadefoot observed at ponding area at intersection of Fairmead Boulevard and Avenue 23 (37.083652, -120.206208, looking north).  
Photograph taken by Lisa Sandoval on April 30, 2020.





**Photograph 21:** Vernal pool (VP1) located in the median between SR 99 and Fairmead Boulevard containing spiny-sealed button celery (37.082933, -120.206330, looking southwest). Photograph taken by Lisa Sandoval on May 1, 2020.



**Photograph 22:** Spiny-sealed button celery at the VP1 vernal pool in the median between SR 99 and Fairmead Boulevard (37.082296, -120.205937, looking west). Photograph taken by Lisa Sandoval on May 1, 2020.





**Photograph 23:** Vernal Pool VP2 located in the median between SR 99 and Fairmead Boulevard (37.082956, -120.20675, looking northwest). Photograph taken by Lisa Sandoval on May 1, 2020.



**Photograph 24:** Vernal Pool VP3 located in the median between SR 99 and Fairmead Boulevard (37.079842, -120.202386, looking northwest). Photograph taken by Lisa Sandoval on May 1, 2020.





**Photograph 25:** Basin 1 along Road 18  $\frac{3}{4}$  and Arc Drive (37.086881, -120.207200, looking northeast).  
Photograph taken by Lisa Sandoval on May 1, 2020.



**Photograph 26:** Basin 2 along Avenue 24  $\frac{1}{2}$  and Road 16 (37.105831, -120.256893, looking west).  
Photograph taken by Lisa Sandoval on April 30, 2020.





**Photograph 27:** Ditch along Road 18  $\frac{3}{4}$  (37.090744, -120.206727, looking south).  
Photograph taken by Lisa Sandoval on May 1, 2020.

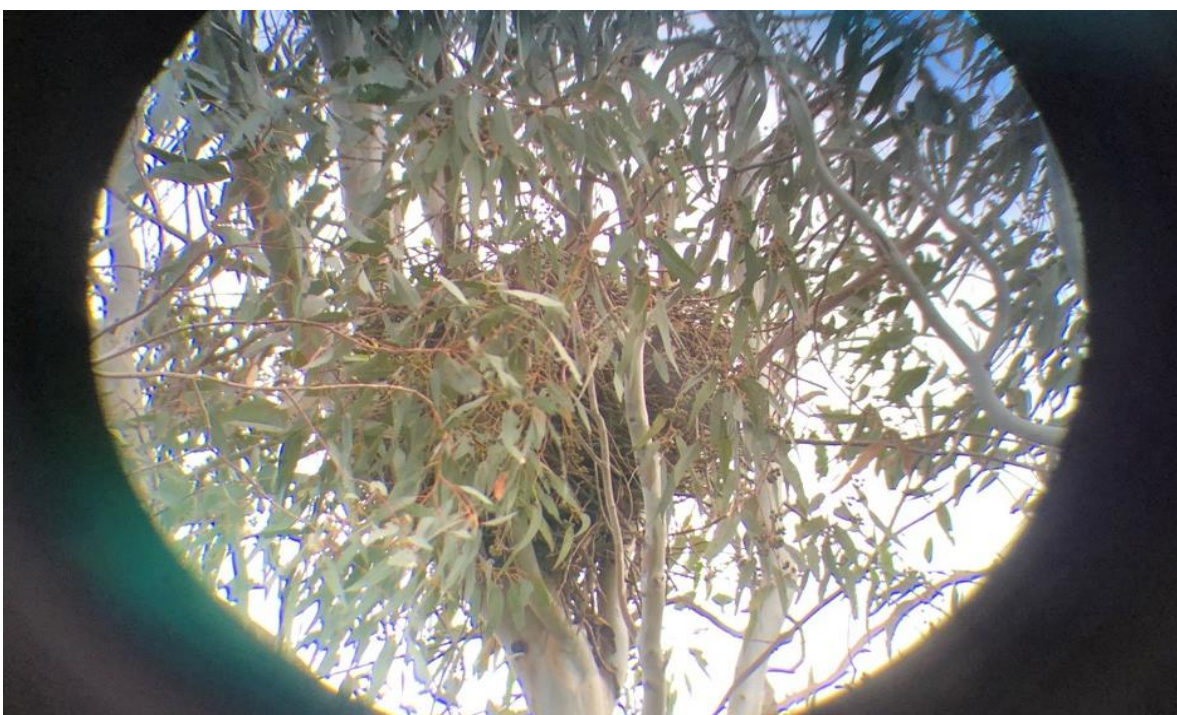


**Photograph 28:** One of the den entrances at the den complex located in Basin 1 along Road 18  $\frac{3}{4}$  and Arc Drive (37.086844, -120.207115, looking south). Photograph taken by Lisa Sandoval on May 1, 2020.





**Photograph 29:** The view of nest N1 within the line of eucalyptus trees in Fairmead, north of where the mating Swainson's hawks were observed (37.078477, -120.189880, looking southwest).  
Photograph taken by Lisa Sandoval on April 7, 2020.



**Photograph 30:** Detail of nest N1 in eucalyptus tree in Fairmead (37.078477, -120.189880, looking southwest). Photograph taken by Lisa Sandoval on April 7, 2020.





**Photograph 31:** The view of nest N2 nest near the Berenda Slough, where a Swainson's hawk was observed perched in the tree (37.105464, -120.256668, looking east).  
Photograph taken by Lisa Sandoval on April 8, 2020.



**Photograph 32:** Detail of nest N2 nest near the Berenda Slough (37.105464, -120.256668, looking east).  
Photograph taken by Lisa Sandoval on April 8, 2020.





**Photograph 33:** The view of nest N3 along SR 99 approximately 0.3 miles to the west of the BSA (37.094210, -120.214245, looking west). Photograph taken by Lisa Sandoval on April 8, 2020.



**Photograph 34: Photograph 32:** Detail of nest N3 with Swanson's hawk perched by the nest (37.094210, -120.214245, looking west). Photograph taken by Lisa Sandoval on April 8, 2020.





**Photograph 35: Photograph 33:** The view of the N4 nest (37.099799, -120.217727, looking northwest).  
Photograph taken by Lisa Sandoval on April 8, 2020.



**Photograph 36:** The view of the N4 nest (37.099799, -120.217727, looking northwest).  
Photograph taken by Lisa Sandoval on April 8, 2020.





**Photograph 37:** Swallow nests at the Road 16 bridge over Berenda Slough (37.100076, -120.256717, looking southwest). Photograph taken by Lisa Sandoval on April 30, 2020.



**Photograph 38:** View of the bat urine stains at the Road 16 bridge over Berenda Slough (37.099779, -120.256733, looking south). Photograph taken by Lisa Sandoval on April 30, 2020.

## **APPENDIX C**

### **PLANT AND ANIMAL SPECIES OBSERVED WITHIN THE BIOLOGICAL STUDY AREA**



**Table C-1**  
**Plant Species Observed within the Biological Study Area on April 8, 2020,**  
**Fairmead – Chowchilla Wastewater Treatment Facility Connection Project,**  
**Madera County, California**

Scientific Name	Common Name	Status	Native or Introduced
<b>Trees</b>			
almond	<i>Prunus dulcis</i>	none	introduced
American century plant	<i>Agave americana</i>	none	introduced
blue gum	<i>Eucalyptus globulus</i>	none	Introduced, Cal-IPC limited
China berry tree	<i>Melia azedarach</i>	none	introduced
Chinese juniper	<i>Juniperus chinensis</i>	none	introduced
Chinese elm	<i>Ulmus parvifolia</i>	none	introduced
common fig	<i>Ficus carica</i>	none	introduced
cork oak	<i>Quercus suber</i>	none	introduced
date palm	<i>Phoenix dactylifera</i>	none	introduced
deodar cedar	<i>Cedrus deodara</i>	none	introduced
Fremont cottonwood	<i>Populus fremontii</i>	none	native
Italian cypress	<i>Cupressus sempervirens</i>	none	introduced
kumquat	<i>Citrus japonica</i>	none	introduced
lemon	<i>Citrus limon</i>	none	introduced
Mexican fan palm	<i>Washingtonia robusta</i>	none	introduced
money tree	<i>Eucalyptus pulverulenta</i>	none	introduced
mulberry	<i>Morus alba</i>	none	introduced
Oleander	<i>Nerium oleander</i>	none	introduced
olive	<i>Olea europaea</i>	none	Introduced, Cal-IPC limited
orange	<i>Citrus sinensis</i>	none	introduced
ornamental banana plant	<i>Musa</i>	none	introduced
ornamental redwood	<i>Sequoia sempervirens</i>	none	native
peach	<i>Prunus persica</i>	none	introduced
Peruvian pepper tree	<i>Sonchus asper</i>	none	introduced
purple leaf plum	<i>Prunus cerasifera</i>	none	introduced
sago palm	<i>Cycas revoluta</i>	none	introduced
silk tree	<i>Albizia julibrissin</i>	none	introduced
silver dollar gum	<i>Eucalyptus polyanthemos</i>	none	introduced
spiny-sealed button celery	<i>Eryngium spinosepalum</i>	1B.2	native
sweetgum	<i>Liquidamar styractiflua</i>	none	introduced
Torrey pine	<i>Pinus torreyana</i>	none	native
tree of heaven	<i>Ailanthus altissima</i>	none	Introduced, Cal-IPC moderate
valley oak	<i>Quercus lobata</i>	none	native
weeping willow	<i>Salix babylonica</i>	none	introduced
<b>Shrubs</b>			
poison hemlock	<i>Conium maculatum</i>	none	Introduced, Cal-IPC moderate

Scientific Name	Common Name	Status	Native or Introduced
<b>Herbs</b>			
black medic	<i>Medicago lupulina</i>	none	introduced
broadleaf filaree	<i>Erodium botrys</i>	none	introduced
common fiddleneck	<i>Amsinckia intermedia</i>	none	introduced
common mallow	<i>Malva neglecta</i>	none	introduced
common mustard	<i>Schinus molle</i>	none	introduced, Cal-IPC limited
common knotweed	<i>Polygonum arenastrum</i>	none	introduced
common sunflower	<i>Helianthus annuus</i>	none	native
curly dock	<i>Rumex crispus</i>	none	introduced, Cal-IPC limited
dwarf brodiaea	<i>Brodiaea terestris</i>	none	native
garden geranium	<i>Pelargonium</i> sp.	none	introduced
hairy vetch	<i>Vicia villosa</i>	none	introduced
honeylocust	<i>Gleditsia triacanthos</i>	none	introduced
miner's lettuce	<i>Claytonia perfoliata</i>	none	introduced
pineappleweed	<i>Matricaria discoidea</i>	none	introduced
popcorn flower	<i>Plagiobothrys</i> sp.	none	native
purple owl's clover	<i>Castilleja exserta</i>	none	native
rose	<i>Rosa</i> sp.	none	introduced
silver leaf nightshade	<i>Solanum elaeagnifolium</i>	none	introduced
spiny sowthistle	<i>Sonchus asper</i>	none	introduced
<b>Grasses</b>			
common spike rush	<i>Eleocharis palustris</i>	none	native
foxtail barley	<i>Hordeum murinum</i>	none	introduced, Cal-IPC moderate
giant reed	<i>Arundo donax</i>	none	introduced, Cal-IPC high
Italian rye grass	<i>Festuca perennis</i>	none	introduced, Cal-IPC moderate
rabbitsfoot grass	<i>Polypogon monspeliensis</i>	none	introduced, Cal-IPC limited
ripgut brome	<i>Bromus diandrus</i>	none	introduced, Cal-IPC moderate
wild oat	<i>Avena fatua</i>	none	introduced, Cal-IPC moderate
<b>Succulents</b>			
Beavertail cactus	<i>Opuntia basilaris</i>	none	native
desert agave	<i>Agave deserti</i> var. <i>simplex</i>	none	introduced
prickly pear cactus	<i>Opuntia engelmannii</i>	none	introduced
San Pedro cactus	<i>Echinopsis pachanoi</i>	none	introduced
Spanish bayonet	<i>Yucca aloifolia</i>	none	introduced

Cal-IPC = California Invasive Plant Council.

**Rating system:** **High** = several ecological impacts; **Moderate** = substantial but not severe ecological impacts; **Limited** = minor ecological impacts or not enough information to justify higher score; **Alert** = species ranked as High or Moderate with limited distribution, but potential to spread; **Watch** = could pose a high risk of becoming invasive in the future.

**CRPR (California Rare Plant Rank):**

1B Rare, Threatened, or Endangered in California and elsewhere

**CRPR Threat Code Extension:**

.2 Fairly endangered in California (20-80% occurrences threatened)

**Table C-2**  
**Animal Species Observed within the Biological Study Area on April 8, 2020,**  
**Fairmead – Chowchilla Wastewater Treatment Facility Connection Project,**  
**Madera County, California**

Scientific Name	Common Name	Status	Native or Introduced
<b>Birds</b>			
American crow	<i>Corvus brachyrhynchos</i>	none	introduced
American kestrel	<i>Falco sparverius</i>	none	native
American robin	<i>Turdus migratorius</i>	none	native
Anna's hummingbird	<i>Calypte anna</i>	none	native
Brewer's blackbird	<i>Euphagus cyanocephalus</i>	none	native
California scrub-jay	<i>Apelocoma californica</i>	none	native
Canada goose	<i>Branta canadensis</i>	none	introduced
Duck	<i>Anas sp.</i>	none	introduced
Eurasian collared-dove	<i>Streptopelia decaocto</i>	none	introduced
great blue heron	<i>Ardea herodias</i>	none	native
great egret	<i>Ardea alba</i>	none	native
house sparrow	<i>Passer domesticus</i>	none	introduced
mallard	<i>Anas platyrhynchos</i>	none	native
mourning dove	<i>Zenaida macroura</i>	none	introduced
Norwegian white geese	<i>Anser caerulescens</i>	none	introduced
red-tailed hawk	<i>Buteo jamaicensis</i>	none	native
red-winged blackbird	<i>Agelaius phoeniceus</i>	none	native
Swainson's hawk	<i>Buteo swainsoni</i>	CT	native
western kingbird	<i>Tyrannus verticalis</i>	none	native
Western spadefoot	<i>Spea hammondi</i>	SSC	native
white crowned sparrow	<i>Zonotrichia leucophrys</i>	none	native
<b>Mammals</b>			
California ground squirrel	<i>Otospermophilus beecheyi</i>	none	native
domestic goat	<i>Capra sp.</i>	none	introduced
guinea fowl	<i>Numida meleagris</i>	none	introduced
Jersey cow	<i>Bos taurus</i>	none	introduced
quarter horse	<i>Equus caballus</i>	none	introduced

CT = California threatened

SSC = State Species of Special Concern

## **APPENDIX D**

### **SPECIAL-STATUS SPECIES DATABASE SEARCH RESULTS EVALUATION**

**Table D-1**  
**Special-Status Plant Species in the Regional Vicinity of the Fairmead – Chowchilla**  
**Wastewater Treatment Facility Connection Project,**  
**Madera County California**

Scientific Name	Common Name	Status	General Habitat Description	Potential to Occur	Rationale
<b>SENSITIVE NATURAL COMMUNITIES</b>					
Northern Hardpan Vernal Pool	Northern Hardpan Vernal Pool	G3, S3.1	This community occurs on old, very acidic, Fe-Si cemented hardpan soils (Redding, San Joaquin, and similar series). The microrelief on these soils typically is hummocky, with mounds intervening between localized depressions. Winter rainfall perches on the hardpan, forming pools in the depressions. Evaporation (not runoff) empties pools in the spring.	<b>No</b>	This community is absent from the BSA. The closest record of this community was located 3.5 miles to the north of the BSA. This community was not observed during the 2020 field survey and is not expected to occur within the BSA.
Valley Sacaton Grassland	Valley Sacaton Grassland	G1, S1.1	This plant community occurs in fine-textured, poorly drained, usually alkaline soils.	<b>No</b>	This community is absent from the BSA. There are no CNDDDB records within 10 miles of the BSA. This community was not observed during the 2020 field survey and is not expected to occur within the BSA.

Scientific Name	Common Name	Status	General Habitat Description	Potential to Occur	Rationale
Valley Sink Scrub	Valley Sink Scrub	G1, S1.1	Heavy, saline and/or alkaline clays of lakebeds or playas with <i>Allenrolfia</i> , salt grass, <i>Lasthenia</i> , etc.	No	This community is absent from the BSA. There are no CNDDDB records within 10 miles of the BSA. This community was not observed during the 2020 field survey and is not expected to occur within the BSA.
<b>SPECIAL-STATUS PLANTS</b>					
<i>Atriplex cordulata</i> var. <i>cordulata</i>	heartscale	1B.2	Annual herb; blooms April to October; occurs on saline or alkaline soils in chenopod scrub, meadows and seeps, and valley and foothill grassland (also sandy soils in this habitat); elevation ~0 to 1,840 feet; documented on foothills, lower mountains, and Central Valley floor; threatened by trampling.	No	No chenopod scrubland, meadows and seeps, or alkaline soil are present within the BSA. The closest CNDDDB records of this species occur approximately 2 miles to the northwest and southwest of the BSA. This species was not observed during the 2020 field survey and is not expected to occur within the BSA.
<i>Atriplex depressa</i>	brittlescale	1B.2	Annual herb; blooms April to October; occurs on alkaline and clay soils in chenopod scrub, meadows and seeps, playas, vernal pools, and valley and foothill grassland; elevation ~ 1 to 1050 feet; threatened by	No	No chenopod scrubland, meadows and seeps, playas, or vernal pool habitat with alkaline and clay soils to support this species are present within the BSA. There are no CNDDDB records within



Scientific Name	Common Name	Status	General Habitat Description	Potential to Occur	Rationale
			development, grazing, and trampling; documented on Central Valley floor, foothills, and lower mountains.		10 miles of the BSA. This species was not observed during the 2020 field survey and is not expected to occur within the BSA.
<i>Atriplex minuscula</i>	lesser saltscale	1B.1	Annual herb; blooms May to October; occurs on alkaline and sandy soils in chenopod scrub, playas, and valley and foothill grassland; elevation ~50 to 655 feet; threatened by agriculture and solar energy development; documented primarily on Central Valley floor with some lower foothill occurrences	No	No chenopod scrub or playa habitat or alkaline soil to support this species are present within the BSA. The closest CNDDDB record of this species is 4.5 miles to the southwest of the BSA. This species was not observed during the 2020 field survey and is not expected to occur within the BSA.
<i>Atriplex persistens</i>	vernal pool smallscale	1B.2	Annual herb; blooms June and August to October; restricted to alkaline vernal pools on the floor of the San Joaquin Valley and is endemic to California; elevation ~ 30 to 375 feet; threatened by agriculture and flood control activities; documented primarily on Central Valley floor.	No	No alkaline vernal pool habitat that would support this species is present within the BSA. There are no CNDDDB records of this species occurring within 10 miles of the BSA. This species was not observed during the 2020 field survey and is not expected to occur within the BSA.

Scientific Name	Common Name	Status	General Habitat Description	Potential to Occur	Rationale
<i>Atriplex subtilis</i>	subtle orache	1B.2	Annual herb; blooms June, August, September, and possibly October; occurs on alkaline soils in valley and foothill grassland; elevation ~130 to 330 feet; threatened by agriculture and possibly solar energy development; documented primarily on Central Valley floor.	No	No alkaline soils that would support this species are present within the BSA. The closest CNDDDB record of this species occurs approximately 4.5 miles southwest of the BSA. This species was not observed during the 2020 field survey and is not expected to occur within the BSA.
<i>Calycadenia hooveri</i>	Hoover's calycadenia	1B.3	Annual herb; blooms July to September; occurs on rocky soils in cismontane woodland and valley and foothill grassland; elevation ~ 215-985 feet; threatened by development; documented primarily in eastern foothills of Central Valley.	No	No cismontane woodland habitat or rocky soils that would support this species are present within the BSA. There are no CNDDDB records of this species occurring within 10 miles of the BSA. This species was not observed during the 2020 field survey and is not expected to occur within the BSA.
<i>Castilleja campestris</i> var. <i>succulenta</i>	succulent owl's-clover	FT, CE, 1B.2, CH	Annual herb (hemiparasitic); blooms April to May, sometimes as early as March; occurs vernal pools, swales and some seasonal wetlands, often on acidic soils; elevation ~165-	Yes	Vernal pool habitat (VP1 through VP3) that would support this species is present within the BSA. The closest CNDDDB record of this species occurs approximately

Scientific Name	Common Name	Status	General Habitat Description	Potential to Occur	Rationale
			2,460 feet; threatened by urban and agricultural development, flood control, grazing, and trampling; documented primarily on eastern Central Valley floor and foothills from Fresno County north.		4.5 miles east of the BSA. This species was not observed during the 2020 field survey but could occur within the above listed aquatic features.
<i>Clarkia virgata</i>	Sierra clarkia	4.3, G3, S3	Annual herb; blooms May to August; occurs in cismontane woodland and lower montane coniferous forest; ranges in elevation from 1,312 to 5,298 feet.	No	No cismontane woodland and lower montane coniferous forest that would support this species are present within the BSA. There are no CNDDDB records of this species occurring within 10 miles of the BSA. This species was not observed during the 2020 field survey and is not expected to occur within the BSA.
<i>Chloropyron palmatum</i>	palmate-bracted bird's-beak	FE, CE, 1B.1	Annual herb; blooms from May to October; occurs in chenopod scrub and valley and foothills grassland; ranges in elevation from 16 to 508 feet.	No	No chenopod scrub and valley and foothills grassland that would support this species are present within the BSA. There are no CNDDDB records of this species occurring within 10 miles of the BSA. This species was not observed during the 2020 field survey and is not

Scientific Name	Common Name	Status	General Habitat Description	Potential to Occur	Rationale
					expected to occur within the BSA.
<i>Cryptantha hooveri</i>	Hoover's cryptantha	1A	Annual herb; blooms April to May; occurs in inland dunes and Valley and foothill grasslands on sandy soils; endemic to California; ranges in elevation from 29 to 262 feet.	<b>No</b>	No inland dunes or sandy valley foothill grassland habitat that would support this species are present within the BSA. The closest CNDDDB record of this species occurs approximately 7.8 miles west of the BSA. This species was not observed during the 2020 field survey and is not expected to occur within the BSA.
<i>Delphinium hansenii</i> ssp. <i>ewanianum</i>	Ewan's larkspur	4.2	Perennial her; blooms from March to May; occurs in cismontane woodland and valley and foothills grassland; ranges in elevation from 196 to 1,968 feet.	<b>No</b>	No cismontane woodland and valley and foothills grassland that would support this species are present within the BSA. There are no CNDDDB records of this species occurring within 10 miles of the BSA. This species was not observed during the 2020 field survey and is not expected to occur within the BSA.
<i>Delphinium recurvatum</i>	recurved larkspur	1B.2	Perennial herb; blooms March to June; occurs in alkaline	<b>No</b>	No alkaline conditions in chenopod scrub or grassland

Scientific Name	Common Name	Status	General Habitat Description	Potential to Occur	Rationale
			conditions in chenopod scrub, cismontane woodland, and valley and foothill grassland; elevation ~10 to 2,591 feet; occurs throughout Central Valley and Coast Ranges from Butte County south; few occurrences in Antelope Valley; threatened by agriculture and competition from non-native plants.		habitat that would support this species are present within the BSA. The closest CNDDDB record of this species occurs approximately 7.8 miles west of the BSA. This species was not observed during the 2020 field survey and is not expected to occur within the BSA.
<i>Eryngium spinosepalum</i>	spiny-sepaled button-celery	1B.2	Annual or perennial herb; blooms April to June; occurs in vernal pools and moist areas in valley and foothill grasslands; elevation ~260-3200 feet; threatened by development, grazing, road maintenance, hydrological alterations, and agriculture; documented primarily in foothills of Sierra Nevada with scattered occurrences on Central Valley floor and western foothills and lower mountains.	<b>Present</b>	Habitat that could support this species including vernal pools (VP1 through VP3) and moist grassland areas (W1) occur with the BSA. The closest CNDDDB record of this species occurs approximately 3.7 miles north of the BSA. Spiny-sepaled button celery was identified within the BSA in a dry vernal pool located between SR 99 and Fairmead Boulevard.
<i>Layia munzii</i>	Munz's tidy-tips	1B.2	Annual herb; blooms from March to April; occurs in chenopod scrub and valley and foothill grassland in alkaline	<b>No</b>	No chenopod scrub and valley and foothill grassland that would support this species are present within the BSA.

Scientific Name	Common Name	Status	General Habitat Description	Potential to Occur	Rationale
			clay; ranges in elevation from 492 to 2,296 feet.		The closest CNDDDB record of this species occurs approximately 7.3 miles southeast of the BSA. This species was not observed during the 2020 field survey and is not expected to occur within the BSA.
<i>Leptosiphon serrulatus</i>	Madera leptosiphon	1B.2	Annual herb; blooms April to May; occurs in cismontane woodland and lower montane coniferous forest; ranges in elevation from 984 to 4,265 feet.	No	No cismontane woodland and lower montane coniferous forest that would support this species are present within the BSA. There are no CNDDDB records of this species occurring within 10 miles of the BSA. This species was not observed during the 2020 field survey and is not expected to occur within the BSA.
<i>Navarretia nigelliformis</i> ssp. <i>nigelliformis</i>	adobe navarretia	4.2	Annual herb; blooms from April to June; occurs on clay and sometimes serpentinite in valley and foothill grassland vernal mesic and sometimes in vernal pools; ranges in elevation from 328 to 3,280 feet.	No	No vernal pools with clay and serpentinite soil conditions that would support this species are present within the BSA. There are no CNDDDB records of this species occurring within 10 miles of the BSA. This species was not observed during the 2020



Scientific Name	Common Name	Status	General Habitat Description	Potential to Occur	Rationale
					field survey and is not expected to occur within the BSA.
<i>Navarretia nigelliformis</i> ssp. <i>radians</i>	shining navarretia	1B.2	Annual herb; occurs in cismontane woodland, valley and foothill grassland and in vernal pools on clay soils; blooms April to July; ranges in elevation from 249 to 3,280 feet.	No	No vernal pool with clay substrates that would support this species are present within the BSA. The closest CNDDDB record of this species occurs approximately 10 miles southeast of the BSA. This species was not observed during the 2020 field survey and is not expected to occur within the BSA.
<i>Neostapfia colusana</i>	Colusa grass	FT, CE, 1B.1, CH	Annual herb; blooms from May to August; occurs in vernal pools, usually larger pools and on adobe soils; elevation ~16 to 650 feet; threatened by agriculture, development, overgrazing, hydrologic alterations, non-native plants, and habitat loss/fragmentation; documented primarily on Central Valley floor from Merced County northward.	No	No vernal pools with adobe soils that would support this species are present within the BSA. There are no CNDDDB records of this species occurring within 10 miles of the BSA. This species was not observed during the 2020 field survey and is not expected to occur within the BSA.

Scientific Name	Common Name	Status	General Habitat Description	Potential to Occur	Rationale
<i>Orcuttia inaequalis</i>	San Joaquin Valley Orcutt grass	FT, CE, 1B.1, CH	Annual herb; blooms April to September; occurs in vernal pools; elevation ~32-2,500 feet; threatened by agricultural, development, overgrazing, channelization, and non-native plants; documented primarily on eastern Central Valley floor and foothills from Visalia north.	<b>Yes</b>	Vernal pool habitat (VP1 through VP3) that would support this species is present within the BSA. The closest CNDDDB record of this species occurs approximately 7 miles north of the BSA. This species was not observed during the 2020 field survey but could occur in vernal pools VP1, VP2, and VP3.
<i>Orcuttia pilosa</i>	hairy Orcutt grass	FE, CE, 1B.1, CH	Annual herb; blooms May to September; occurs in vernal pools; often in acidic and saline-alkaline soils; elevation ~150 to 655 feet; threatened by agriculture, urbanization, overgrazing, non-native plants, and trampling; only known from a few locations on the Central Valley floor and lower foothills in Madera, Merced, and Stanislaus counties, and the very northern portion of the valley in Butte, Glenn, and Tehama counties.	<b>Yes</b>	Vernal pool habitat (VP1 through VP3) that would support this species is present within the BSA. The closest CNDDDB record of this species occurs approximately 10 miles southeast of the BSA. This species was not observed during the 2020 field survey This species was not observed during the 2020 field survey but could occur in vernal pools VP1, VP2, and VP3.
<i>Phacelia ciliata</i> var. <i>opaca</i>	Merced phacelia	3.2	Annual herb; blooms February to May; occurs in valley and foothill grassland in clay soils,	<b>No</b>	No clay or alkaline soil is present within the BSA. The closest CNDDDB record of this

Scientific Name	Common Name	Status	General Habitat Description	Potential to Occur	Rationale
			sometimes alkaline soil; elevation ~195 to 490 feet.		species occurs approximately 8.5 miles north of the BSA. This species was not observed during the 2020 field survey and is not expected to occur within the BSA.
<i>Puccinellia simplex</i>	California alkali-grass	1B.2	Annual herb; blooms March to May; occurs in vernal moist, alkaline conditions in chenopod scrub, meadows and seeps, valley and foothill grassland, and vernal pools, usually on sinks, flats, and lake margins; elevation ~6 to 3,050 feet; threatened by hydrological alterations, urbanization, agricultural conversion, development, and habitat fragmentation/disturbance; scattered documented occurrence throughout Central Valley, coast ranges, and Mohave desert.	No	No alkaline conditions in chenopod scrub, meadows and seeps, or vernal pool habitat are present within the BSA. The closest CNDDDB record of this species occurs approximately 9.7 miles northwest of the BSA. This species was not observed during the 2020 field survey and is not expected to occur within the BSA.
<i>Tuctoria greenei</i>	Greene's tuctoria	FE, CR 1B.1, CH	Annual herb; blooms May to July, sometimes September; occurs in small or shallow vernal pools, primarily on Anita clay and Tuscan loam soils;	No	No vernal pool habitat with Anita clay or Tuscan loam soils are present within the BSA. The closest CNDDDB record of this species occurs

Scientific Name	Common Name	Status	General Habitat Description	Potential to Occur	Rationale
			elevation ~100 to 3510 feet; threatened by agriculture, urbanization, overgrazing, and habitat fragmentation; documented on Central Valley floor and surrounding foothills; many occurrences presumed extirpated.		approximately 6 miles northeast of the BSA. This species was not observed during the 2020 field survey and is not expected to occur within the BSA.
<b>INVERTEBRATES</b>					
<i>Branchinecta conservatio</i>	Conservancy fairy shrimp	FE, CH	This fairy shrimp species is endemic to the grasslands of the northern two-thirds of the central valley. It is found in large, turbid pools and inhabits astatic pools located in swales formed by old, braided alluvium filled by winter/spring rains.	No	Large, turbid pools and inhabits astatic pools located in swales that could support this species are absent from the BSA. The closest CNDDDB record is approximately 10.5 miles northwest of the BSA. This species was not observed during the 2020 field survey and is not expected to occur within the BSA.
<i>Branchinecta lynchi</i>	vernal pool fairy shrimp	FT, CH	This fairy shrimp species occurs in a variety of vernal pool habitats from small, clear sandstone rock pools to large, turbid, alkaline, grassland valley floor pools.	Yes	Three vernal pools (VP1 through VP3) and one wetland (W1) in grassland habitat that could support this species are present within the BSA. The nearest CNDDDB record of this species

Scientific Name	Common Name	Status	General Habitat Description	Potential to Occur	Rationale
					was documented in 2001 approximately 0.1 miles west of the BSA. The record was observed 375 feet of intersection of Highway 99 and Road 19 within tire tracks on the east side of the lateral canal. This species was not observed during the 2020 field survey but the above listed aquatic features may provide conditions that could support this species.
<i>Branchinecta mesovallensis</i>	midvalley fairy shrimp	G2, S2	This fairy shrimp species occurs in vernal pools, vernal swales, and other ephemeral water bodies' sometimes in roadside puddles. This species generally requires shallow vernal pools with low to moderate dissolved salts. Commonly on "riverbank" geologic formations and on low terrace, basin rim, and volcanic mudflow landforms at low elevations with low gradients.	Yes	Three vernal pools (VP1 through VP3) and one wetland (W1) in grassland habitat that could support this species are present within the BSA. The nearest CNDDDB record of this species was approximately 5.5 miles northeast of the BSA. This species was not observed during the 2020 field survey but the above listed aquatic features may provide conditions that could support this species.

Scientific Name	Common Name	Status	General Habitat Description	Potential to Occur	Rationale
<i>Desmocerus californicus dimorphus</i>	Valley elderberry longhorn beetle	FT	This beetle species is associated with and entirely dependent on elderberry bushes ( <i>Sambucus</i> spp.) in the Central Valley.	No	Elderberry shrub habitat that could support this species is absent from the BSA. The closest CNDDDB record of this species is approximately 5 miles north of the BSA. This species was not observed during the 2020 field survey and is not expected to occur within the BSA.
<i>Lepidurus packardii</i>	vernal pool tadpole shrimp	FE, CH	This fairy shrimp species occurs in vernal pools with clear to high turbidity.	No	No vernal pools with high turbidity that could support this species are present in the BSA. The nearest CNDDDB record of this species was approximately 5.5 miles northeast of the BSA. This species was not observed during the 2020 field survey and is not expected to occur within the BSA.
<i>Lindieriella occidentalis</i>	California linderiella	G2G3, S2S3	This fairy shrimp species occurs in a variety of natural, and artificial, seasonally ponded habitat types including vernal pools, swales, ephemeral drainages, stock ponds, reservoirs, ditches, backhoe	Yes	Three vernal pools (VP1 through VP3) and one wetland (W1) in grassland habitat that could support this species are present within the BSA. The nearest CNDDDB record of this species was approximately 6 miles



Scientific Name	Common Name	Status	General Habitat Description	Potential to Occur	Rationale
			pits, and ruts caused by vehicular activities.		northeast of the BSA. This species was not observed during the 2020 field survey but the above listed aquatic resources and may provide conditions that could support this species.
<i>Lytta moesta</i>	moestan blister beetle	G2, S2	This beetle species occurs in grasslands of the Central Valley of California and foothills of the Sierra Nevada. Adults are herbivorous, with many species feeding mostly on flowers, but some feed on foliage.	No	Habitat that could support this species is absent from the BSA. The nearest CNDDDB record of this species was approximately 6.7 miles southeast of the BSA. This species was not observed during the 2020 field survey and is not expected to occur within the BSA.
<i>Lytta molesta</i>	molestan blister beetle	G2, S2	This beetle species central California; feeding on <i>Lupinus</i> and <i>Trifolium wormskioldii</i> in dried vernal pools; absent in nearby areas with non-vernal pool vegetation,	No	Habitat that could support this species is absent from the BSA. There are no CNDDDB records of this species within 10 miles of the BSA. This species was not observed during the 2020 field survey and is not expected to occur within the BSA.

Scientific Name	Common Name	Status	General Habitat Description	Potential to Occur	Rationale
<b>FISH</b>					
<i>Hypomesus transpacificus</i>	Delta smelt	FE, CT	This species occurs in the Sacramento and San Joaquin estuaries of the San Francisco Bay. Occurs primarily in main water bodies and sloughs of the Delta and Suisun Bay. Not directly associated with small stream systems.	<b>No</b>	Habitat that could support this species is absent from the BSA. There were no CNDDBs record of this species occurring within 10 miles of the BSA. Berenda Slough is an intermittent stream that does not does not contain sufficient water to support this species. This species was not observed during the 2020 field survey and is not expected to occur within the BSA.
<i>Oncorhynchus mykiss</i> <i>irideus pop. 11</i>	steelhead - Central Valley DPS	FT, G5, S2	Central Valley Steelhead occurs in stream and rivers with connections with the San Joaquin River. These fish hatch in gravel-bottomed, fast-flowing, well-oxygenated rivers and streams.	<b>No</b>	Habitat that could support this species is absent from the BSA. There were no CNDDBs record of this species occurring within 10 miles of the BSA. Berenda Slough is an intermittent stream that does not does not contain sufficient water to support this species. This species was not observed during the 2020 field survey and is not

Scientific Name	Common Name	Status	General Habitat Description	Potential to Occur	Rationale
					expected to occur within the BSA.
<b>AMPHIBIANS</b>					
<i>Ambystoma californiense</i>	California tiger salamander	FT, CT, CSC	This species occurs in natural ephemeral pools or ponds that mimic them, and that remain inundated for 12 weeks or more. It requires nearby upland habitat containing small mammal burrows or crevices that provide refugia.	<b>No</b>	Ephemeral pool and pond habitat that could support this species is absent from the BSA. The nearest CNDDDB record was approximately 3.6 miles north of the BSA. This species was not observed during the 2020 field survey and is not expected to occur within the BSA.
<i>Rana aurora draytonii</i>	California red-legged frog	FT, CSC	This species occurs in quiet pools of small streams, ponds and marshes, preferably with dense shrubby vegetation such as cattails and willows near deep water pools.	<b>No</b>	Pools and marsh habitat that could support this species is absent from the BSA. There were no CNDDDB records of this species occurring within 10 miles of the BSA. This species was not observed during the 2020 field survey and is not expected to occur within the BSA.
<i>Spea hammondi</i>	western spadefoot	CSC	This species occurs primarily in grassland habitats but can also be found in valley-foothill hardwood woodlands.	<b>Present</b>	Habitat that could support breeding in this species is potentially located within and along Berenda Slough,

Scientific Name	Common Name	Status	General Habitat Description	Potential to Occur	Rationale
			Grasslands with shallow temporary pools are optimal habitats for breeding and egg laying.		wetlands (W1), and irrigation canals/ditches (C1 through C3), basins (Basin 1 and Basin 2), and ditches that intersect the BSA. The nearest CNDDDB record of this species was approximately 5.5 miles northeast of the BSA. This species was observed during the 2020 field survey in an area along the Fairmead Boulevard and Avenue 22 <sup>3</sup> / <sub>4</sub> where water ponded along the roadside. There is potential for this species to establish in aquatic features present within the BSA anytime water is present.
<b>REPTILES</b>					
<i>Emys marmorata</i>	western pond turtle	CSC	This species occurs in ponds and small lakes with abundant vegetation; also found in marshes, slow moving streams, reservoirs, and brackish water. Require basking sites.	<b>Yes</b>	Habitat that could support this species is present within and along Berenda Slough that intersects the BSA. The nearest CNDDDB record of this species was approximately 11 miles northwest of the BSA. This species was not observed during the 2020 field survey but may inhabit

Scientific Name	Common Name	Status	General Habitat Description	Potential to Occur	Rationale
					Berenda Slough when water is present.
<i>Gambelia sila</i>	blunt-nosed leopard lizard	FE, CE, FP	This species occurs in sparsely vegetated alkali and desert scrub habitats, in areas of low topographic relief. It seeks cover in mammal burrows, under shrubs, or structures such as fence posts.	<b>No</b>	Habitat that could support this species is absent from the BSA. There was one CNDDDB record of this species occurring within 10 miles of the BSA. This CNDDDB record was approximately 8 miles southwest of the BSA. This species was not observed during the 2020 field survey and is not expected to occur within the BSA.
<i>Phrynosoma blainvillii</i>	coast horned lizard	CSC	This species inhabits open areas of sandy soil and low vegetation in valleys, foothills and semiarid mountains. Found in grasslands, coniferous forests, woodlands, and chaparral, with open areas and patches of loose soil. Often found in lowlands along sandy washes with scattered shrubs and along dirt roads, and frequently found near ant hills.	<b>No</b>	No habitat that could support this species is present in the BSA. There are no CNDDDB records of this species occurring within 10 miles of the BSA. This species was not observed during the 2020 field survey and is not expected to occur within the BSA.
<i>Thamnophis gigas</i>	giant garter snake	FT, CT	This species primarily occurs in permanent or semi-permanent	<b>Yes</b>	Sloughs, drainage canals, and irrigation ditches are present

Scientific Name	Common Name	Status	General Habitat Description	Potential to Occur	Rationale
			marshes and sloughs, drainage canals, and irrigation ditches, particularly around rice fields. It prefers to reside in sloughs that are flooded in summer and dry in winter. It can occasionally be found in slow-moving creeks. It prefers locations with vegetation close to the water for basking.		in the BSA; however, Berenda Slough is the only feature that could support this species. There were no CNDDDB records of this species occurring within 10 miles of the BSA but there is one record located approximately 28 miles to the northwest. This record is connected to Berenda Slough via Mariposa Bypass and Eastside Bypass Canal. This species was not observed during the 2020 field survey but may occur in Berenda Slough if water is present during the breeding season (May 1 through October 1).
<b>BIRDS</b>					
<i>Agelaius tricolor</i>	tricolored blackbird	CT	This species occurs near fresh water, and prefer emergent wetland vegetation with tall, dense cattails or tules, but is also found in thickets of willow, blackberry, wild rose, and tall herbs. It has been found to nest and forage in grassland and agricultural fields (pastures,	<b>No</b>	Potential foraging and nesting habitat that could support this species is absent from the BSA. The nearest CNDDDB record of this species is approximately 9.5 miles northwest of the BSA. This species was not observed during the 2020 field survey



Scientific Name	Common Name	Status	General Habitat Description	Potential to Occur	Rationale
			dairies, rice fields). A highly social nester, it occurs in large colonies.		and is not expected to occur within the BSA.
<i>Athene cunicularia</i>	burrowing owl	CSC	This species occurs in open annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation.	Yes	Potential foraging and nesting habitat that could support this species is present within the annual grassland habitat, berms of the canals/ditches, and gores along SR 99. The nearest CNDDDB record of this species was approximately 7 miles northwest of the BSA. This species was not observed during the 2020 field survey but has potential to occur from time to time as a transient forager or even to become established within the BSA.
<i>Buteo swainsoni</i>	Swainson's hawk	CT	This species occurs in riparian forests and other forested areas. It roosts in a variety of trees and forage widely over forests, grasslands, and shrublands. It is easily disturbed by human activities.	Present	Potential foraging and nesting habitat for this species occurs within and adjacent to the BSA. Riparian habitat along Berenda Slough and eucalyptus tree habitat along Avenue 24, along SR 99, and bordering the residential area of Fairmead provide

Scientific Name	Common Name	Status	General Habitat Description	Potential to Occur	Rationale
					suitable nesting habitat for this species. The nearest CNDDDB record of this species was approximately 1.5 mile north of the BSA in a cottonwood tree along Berenda Slough. This species was observed during the 2020 field survey overflying BSA and roosting on the trees with the BSA. This species has potential to nest and forage in or within 0.5 mile of the BSA.
<i>Circus cyaneus</i>	northern harrier	CSC	This species occurs in a variety of habitats throughout California and forages in open wetlands, wet pastures, fallow fields, dry uplands, prairies, agricultural lands, and desert shrub-steppe utilizing open uplands including agricultural lands adjacent to foraging habitat for nesting. In California, the current range of the northern harrier includes coastal areas, the Central Valley, northeastern California, and the Sierra Nevada region up to 3,600 feet.	Yes	Potential foraging and nesting habitat that could support this species occurs within the areas of annual grassland that exist in and adjacent to the BSA. There was one CNDDDB record of this species occurring within 6.7 miles northwest of the BSA. This species was not observed during the 2020 field survey but has potential to nest and forage within the BSA.

Scientific Name	Common Name	Status	General Habitat Description	Potential to Occur	Rationale
<i>Haliaeetus leucocephalus</i>	Bald eagle	CE	This species typically nests in forested areas adjacent to large bodies of water, staying away from heavily developed areas when possible. It may congregate for feeding around fish processing plants, dumps, and below dams where fish concentrate. For perching, it prefers tall, mature coniferous or deciduous trees that afford a wide view of the surroundings. It nests in tall, sturdy conifers that protrude above the forest canopy, providing easy flight access and good visibility.	No	Habitat that could support this species is absent from the BSA. The closest CNDDDB record of this species was approximately 6.5 miles northeast of the BSA. This species was not observed during the 2020 field survey but has potential to occur within the BSA.
<b>MAMMALS</b>					
<i>Dipodomys heermanni dixonii</i>	Merced kangaroo rat	G3G4, S2S4	This species is a subspecies of kangaroo rat and occurs in the east side of the San Joaquin Valley (Lower Sonoran Zone). It was recorded at Snelling, near Merced Falls, and below Lagrange. It inhabits open sandy or dusty places.	No	Habitat that could support this species is absent from the BSA. The closest CNDDDB record was approximately 6.5 miles northeast of the BSA. This species or diagnostic sign of kangaroo rats was not observed during the 2020 field survey, and this species is not expected to occur within the BSA.

Scientific Name	Common Name	Status	General Habitat Description	Potential to Occur	Rationale
<i>Dipodomys nitratooides exilis</i>	Fresno kangaroo rat	FE, CE,	This species historically occurred in alkali sink and open grassland habitats on the valley floor in Fresno County and portions of Tulare, Kings, and Madera counties. The last confirmed specimen was captured in 1992 and it may be extinct.	No	Habitat that could support this species is absent from the BSA. There were no CNDDDB records of this species occurring within 10 miles of the BSA. This species was not observed during the 2020 field survey and no diagnostic signs of kangaroo rats were observed, and this species is not expected to occur within the BSA.
<i>Lasiurus cinereus</i>	hoary bat	G5, S4	This species occurs in deciduous and coniferous forests and woodlands, including areas altered by humans. Roost sites usually occur in tree foliage with dense foliage above and open flying room below, often at the edge of a clearing and commonly in hedgerow trees. Sometimes it roosts in rock crevices, but rarely in caves. When hibernating, it has been found on tree trunks, in a tree cavity, in a squirrel's nest, and in a clump of Spanish-moss.	Yes	Riparian habitat along Berenda Slough provides habitat that could support this species within the BSA. The closest CNDDDB record was within 2 miles northwest of the Project site. This species was not observed during the 2020 field survey but eucalyptus trees, cottonwood trees, and oak trees may provide roosting habitat for this species and Berenda Slough, ephemeral ponds, and canals/ditches also provide foraging habitat.

Scientific Name	Common Name	Status	General Habitat Description	Potential to Occur	Rationale
<i>Myotis yumanensis</i>	Yuma myotis	G5, S4	This species occurs near reservoirs and roosts in buildings, trees, mines, caves, bridges, and rock crevices. Maternity colonies are active between May and July.	Yes	Trees, bridges, and buildings are present within the BSA that could provide roosting habitat to support this species. The nearest CNDDDB record was of this species approximately 5.5 miles northwest of the BSA. This species was not observed during the 2020 field survey but eucalyptus trees, cottonwood trees, and oak trees could provide day roosting habitat and swallow nests on the bridge could become occupied by solitary males. Berenda Slough ephemeral ponds, and canals/ditches, and agricultural fields also provide a foraging habitat.
<i>Taxidea taxus</i>	American Badger	CSC	This species occurs in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. It needs sufficient food and open, uncultivated ground. It preys on	Yes	Habitat that could support this species is present within the BSA. Friable soils and denning habitat exist within annual grassland and habitat along Berenda Slough. The nearest CNDDDB record of this

Scientific Name	Common Name	Status	General Habitat Description	Potential to Occur	Rationale
			burrowing rodents and digs burrows.		species was 7.5 miles southwest of the BSA. This species (or its diagnostic sign) was not observed during the 2020 field survey but could be present from time to time as a transient forager and even establish a den within the BSA.
<i>Vulpes macrotis mutica</i>	San Joaquin Kit fox	FE, CT	This species occurs in annual grasslands or grassy open stages with scattered shrubby vegetation. Need loose-textured sandy soils for burrowing, and suitable prey base.	Yes	Denning and foraging habitat that could support this species is present within the annual grassland habitat within the BSA. Surrounding urban and agricultural lands, grasslands and cropland within and adjacent to the BSA provide foraging habitat for this species. The nearest CNDDDB record was 10.3 miles north of the BSA. This species (or its diagnostic sign) was not observed during the 2020 field survey but could be present from time to time as a transient forager and even establish a den within the BSA.



**Sources:**

California Department of Fish and Wildlife (CDFW). 2020a. California Natural Diversity Data Base, California Department of Fish and Wildlife Sacramento, CA.  
 California Native Plant Society (CNPS). 2020. Inventory of Rare and Endangered Plants (online edition). California Native Plant Society. Sacramento, CA.  
 United States Fish and Wildlife Service (USFWS). 2020a. Federal Endangered and Threatened Species List.

**Abbreviations:**

FE	Federal Endangered Species
FT	Federal Threatened Species
PFT	Proposed as Federally Threatened Species
MBTA	Species Protected Under the Auspices of the Migratory Bird Treaty Act
CE	California Endangered Species
CT	California Threatened Species
CSC	California Department of Fish and Game Species of Special Concern
CH	USFWL Critical Habitat
1A	California Native Plant Society List 1A Species- Plants Presumed Extinct in California
1B.1	California Native Plant Society List 1B Species-Plants Categorized as Rare, Threatened, or Endangered in California and Elsewhere; Seriously Endangered in California
1B.2	California Native Plant Society List 1B Species-Plants Categorized as Rare, Threatened, or Endangered in California and Elsewhere; Fairly Endangered in California.
1B.3	California Native Plant Society List 1B Species-Plants Categorized as Rare, Threatened, or Endangered in California and Elsewhere; Not Very Endangered in California
2A	California Native Plant Society List 2A Species-Plants categorized as Presumed Extirpated in California, But More Common Elsewhere
2B.1	California Native Plant Society List 2B Species-Plants Categorized as Endangered in California; Seriously Endangered
2B.2	Native Plant Society List 2B Species-Plants Categorized as Endangered in California; Fairly Endangered in California
2B.3	Native Plant Society List 2B Species-Plants Categorized as Endangered in California; Not Very Endangered in California
3.1	Native Plant Society List 3 Species-Plants Categorized as Needs More Information; Seriously Endangered in California
3.2	Native Plant Society List 3 Species-Plants Categorized as Needs More Information; Fairly Endangered in California.
3.3	Native Plant Society List 3 Species-Plants Categorized as Needs More Information; Not Very Endangered in California
4.1	Plants of limited distribution (watch list), Seriously Endangered in California; (over 80% of occurrences threatened/high degree and immediacy of threat)
4.2	Plants of limited distribution - Watch list, Fairly Endangered in California (20-80% occurrences threatened)
4.3	Plants of limited distribution - Watch list, Not Very Endangered in California (<20% of occurrences threatened/low degree and immediacy of threat or no current threats known)
G1	Critically Imperiled. At very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors.
G2	Imperiled. At high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors.
G3	Vulnerable. At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.
G4	Apparently Secure. Uncommon but not rare; some cause for long-term concern due to declines or other factors.
G5	Secure. Common; widespread and abundant.
S1	Critically Imperiled. Critically imperiled in the state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
S2	Imperiled. Imperiled in the state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the state/province.
S3	Vulnerable. Vulnerable in the state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
S4	Apparently Secure. Uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5	Apparently Secure. Uncommon but not rare; some cause for long-term concern due to declines or other factors.

**Evaluation Criteria:**

- **No.** Habitat on and adjacent to the site is clearly unsuitable to meet the needs of the species (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime), and species would have been identifiable on-site if present (e.g., oak trees). Protocol surveys (if conducted) did not detect species.
- **Yes.** Conditions on the site may, in some way, support a portion of the species ecology (foraging, reproduction, movement/migration). Protocol surveys were conducted, but negative results do not exclude the potential for a species to occur.
- Present. Species was observed on the site or has been recorded (e.g., California Natural Diversity Database, California Native Plant Society) on the site recently (within the last 5 years)

**APPENDIX E**  
**CULTURAL REPORT**

Berenda USGS 7.5 T 10S R16E. in the NW ¼ of Sections 2, 3, 10, 11, 33, 34  
Chowchilla USGS 7.5 T9S. R16E in the SE ¼ of the NE ¼ of Section 5, 6, 31, 32  
Approximately 10 linear miles

Historic Property Identification Report for  
The Fairmead to Chowchilla Sewer Line Project,  
Madera County, California

Submitted to

Quad Knopf Inc. 2816 Park Avenue Merced, CA 95348

By



May, 2019

6182 Carter Rd.

Mariposa, Ca. 95338

**The locations of and specific information regarding archaeological sites are considered sensitive and may be exempt from the Freedom of Information Act pursuant to 54 USC 307103 (National Historic Preservation Act) and 16 USC Section 470(h) and (Archaeological Resources Protections Act). § 6254 (r): California Public Records Act Exemption from Disclosure. This exempts from disclosure public records of Native American graves, cemeteries, and sacred places maintained by the Native American Heritage Commission**

**The archaeological studies prepared in this document, including any surveys or mitigation plans containing specific information on archaeological sites, should not be released to the general public or unauthorized persons to protect these locations from unintended harm**

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## Summary of the Findings

The City of Chowchilla proposes the Fairmead to Chowchilla Sewer Expansion Project in Madera County, California, constructing a new sewer line from Fairmead to Chowchilla and making improvements on an existing facility. The project will receive funding from the Regional Water Quality Control Board which requires that the report follows Title 54 USC § 306108, (Section 106) of the National Historic Preservation Act (NHPA) and California Environmental Quality Act (CEQA).

Culturescape has been retained by Quad Knopf to complete a Historic Properties Inventory Report (HPIR) for the City of Chowchilla in support of the project to fulfill these requirements. Efforts to identify cultural resources within the area included a record search at the Southern San Joaquin Information Center (SSJVIC), a part of the California Historical Resources Information System (CHRIS). Site sensitivity maps were examined and a paleontological records search was conducted with a desktop review completed that included analysis of the significance of the sedimentary layers that underlie the project. Tribal consultation was conducted by the City of Chowchilla under the guidelines of AB 52, and no contact by Culturescape was conducted.

A Phase I cultural resources survey was conducted pursuant to 36 code of Federal Regulations (CFR) § 800 of the National Historic Preservation Act (NHPA) (1966 as amended in 200) and Public Resources Code (PRC) Sections P21000 et seq. and California Code of Regulations (CCR), Title 14, Chapter 3, and sections 15000 et seq. of the California Environmental Quality Act (CEQA). According to Section 106 (16 USC § 470w(5)) of the NHPA, federal agencies are required to take into account the effects of their undertakings on *historical resources*, which refers to cultural resources listed, or eligible for listing in, the California Register of Historic Resources (CRHR). Recommendations of eligibility and effects for Section 106 compliance are included in this report.

### Identified Resources

The results of the survey included the recordation of the original boulevards with palm tree-lined medians that are located on Sinclair Street and on Maple Street. These were recorded using the appropriate Department of Parks and Recreation (DPR) 523 forms. These features were evaluated to determine their eligibility for inclusion in the National Register of Historic Places (NRHP) and The California Register of Historic Resources (CRHR). While this feature is significant under Criterion 1 of the CRHR, for the initial development of Fairmead, because of a lack of historic integrity to convey this significance these are recommended as ineligible for inclusion in either the CRHR or NRHP. Furthermore, construction will not impact either of these features.

### Conclusion/Recommendations

Because these streets remained undeveloped, it is possible there may be artifacts relating to the founding and evolution of Fairmead contained within the fill on the undeveloped portion of the historic roadways. The identification of isolated artifacts that are dispersed in low density will have little value except for an over-all baseline. Discrete deposits, such as privies or trash pits are not expected; however, artifacts that are with located in dense clusters or sheet deposits can offer insight into specific time periods. It is therefore suggested that archaeological monitoring be conducted during subsurface work on Maple Street, Sinclair Street, Elm Street, Avenue 22 ½ and Yates Avenue. Or that at a minimum, a standardized cultural resources tailgate be conducted prior to the start of construction with



the crew responsible for the work. If buried cultural materials are encountered during construction, work is to stop in that area until a qualified archaeologist can evaluate the nature and significance of the find.

This report will be filed with the Southern San Joaquin Valley Information Center at the California State University, Bakersfield, from the Culturescape office in Mariposa, California. Documentation and photographs are held by Culturescape.

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## Introduction to the Study

The unincorporated Community of Fairmead, in Madera County, does not have community water and sewer systems and is served by individual well and septic. Potential for contamination of groundwater supplies has caused the State and County to request that the City of Chowchilla allow Fairmead to utilize the City's existing wastewater treatment plant. This would require construction of a sewer line from Fairmead to Chowchilla.

The proposed project would abandon the septic tanks and leach fields in Fairmead, and direct wastewater flows through a new sewer trunk line to the City of Chowchilla's Wastewater Treatment Facility (WWTF) (Project). Approximately 175 residential connections, the Fairmead Elementary School, and a commercial property will be connected to the City of Chowchilla's WWTF. The proposed Project includes a collection system, pump station, force main and gravity main with wastewater treatment and disposal at the existing City of Chowchilla WWTF. The Project will include the following components.

### **Fairmead Gravity Collection System and Lift Station**

The new sewer collection system will drain to a centrally located pump lift station in 4-in to 10-in diameter sewer pipes, with 4-ft or 5-ft diameter manholes spaced at least every 500-ft. Gravity sewer trenches will be 1.5-ft to 3-ft wide and vary from 3-ft to 20-ft deep.

The sewer lift station will be centrally located in Fairmead, 20-ft to 25-ft deep, with appurtenances to include a standby generator, an earthen emergency basin, an odor control scrubber, and a small building to house electrical panels, all on a one-acre site.

The Area of Potential Effects (APE), approximately 5 linear miles, from the Fairmead Elementary School at Avenue 22  $\frac{3}{4}$  and Road 19  $\frac{1}{2}$ , located on the Berenda USGS 7.5 topographic map, T 10S R16E. in the NW  $\frac{1}{4}$  of Section 11. The project follows the section line north on Road 18  $\frac{3}{4}$  between Section 10 and 11 and 2 and 3 before turning west on Avenue 24 along the Section Line for 34 and 3 and 33 and 4. This is also the Township Line. The project ends at The Chowchilla Municipal Wastewater Treatment Plant located at Avenue 24  $\frac{1}{2}$  and Road 16 on the Chowchilla USGS 7.5 topographic in T9S. R16E in the SE  $\frac{1}{4}$  of the NE  $\frac{1}{4}$  of Section 31 (Figure 1-2).

### **Force Main and Gravity Sewer Line**

The proposed lift station will discharge effluent to a force main that will consist of one to two 4-in to 8-in diameter pipes approximately 2.5 miles long from the Community of Fairmead to Avenue 24 on the west side of Highway 99, inside the City of Chowchilla.

The City's existing 18-in gravity sewer main will be extended south along Road 16 and then east along Avenue 24 and will terminate on the west side of Highway 99 for a distance of 2.2 miles where it will connect to the new force main.

Both the force main and gravity main will be installed in the roadway and roadway shoulders. The precise footprint of the pipe alignment has not been determined, however, it will be within the public right-of-way and can be expected to vary from side to side of the road to avoid existing utilities. The area of disturbance may be up to 20' either side of the road. During construction there will be an open cut trench, 3' to 5' wide, and from 3' to 20' deep. The alignment will jack and bore the pipeline beneath the SR 99 and the Union Pacific railroad tracks, as well as beneath Berenda Slough, as the preferred method to avoid disturbance to water and habitat, if present. It is possible that the gravity line can be



tied to the underside of the Road 16 bridge over Berenda Slough, which will be determined as design advances. There are also three canal crossings that may utilize open trench methods but tunneling may be required if water is present. The project requires tunneling beneath SR 99 and the Union Pacific Railroad. The total length of both the proposed gravity line and the proposed force main segments will be 4.7 miles. The construction staging and materials storage area will be within the City's existing WWTF compound.

Culturescape was retained by Quad Knopf to complete a Historic Properties Inventory Report (HPIR) for the City of Chowchilla in support of the project to fulfill requirements of CEQA and Section 106 in an effort to identify cultural resources within the area. This included a record search at the Southern San Joaquin Information Center (SSJVIC), a part of the California Historical Resources Information System (CHRIS). An examination of site sensitivity maps and a paleontological records search was conducted with a desktop review completed that included analysis of the significance of the sedimentary layers that underlie the project. Finally, a field survey was conducted, cultural resources that were identified were further evaluated regarding eligibility for inclusion into either the CRHR or the NRHP. Tribal consultation was conducted by the City of Chowchilla under the guidelines of AB 52, and no contact by Culturescape was conducted.

M. C. Kile (M.A.), who meets or exceeds the Secretary of the Interior N.P.S. guidelines and qualifications for historical and Prehistoric Archaeology according to Code of Federal Regulations, 36 CFR Part 61., served as Project Archaeologist and manager of all work conducted. Archaeologist Keith Hamm (B.A.) provided support for survey. Qualifications for personnel are provided in Attachment F.

The archaeological work documented in this report is presented in accordance with *Archaeological Resource Management Reports (ARMR): Recommended Contents and Format* (Office of Historic Preservation 1990).

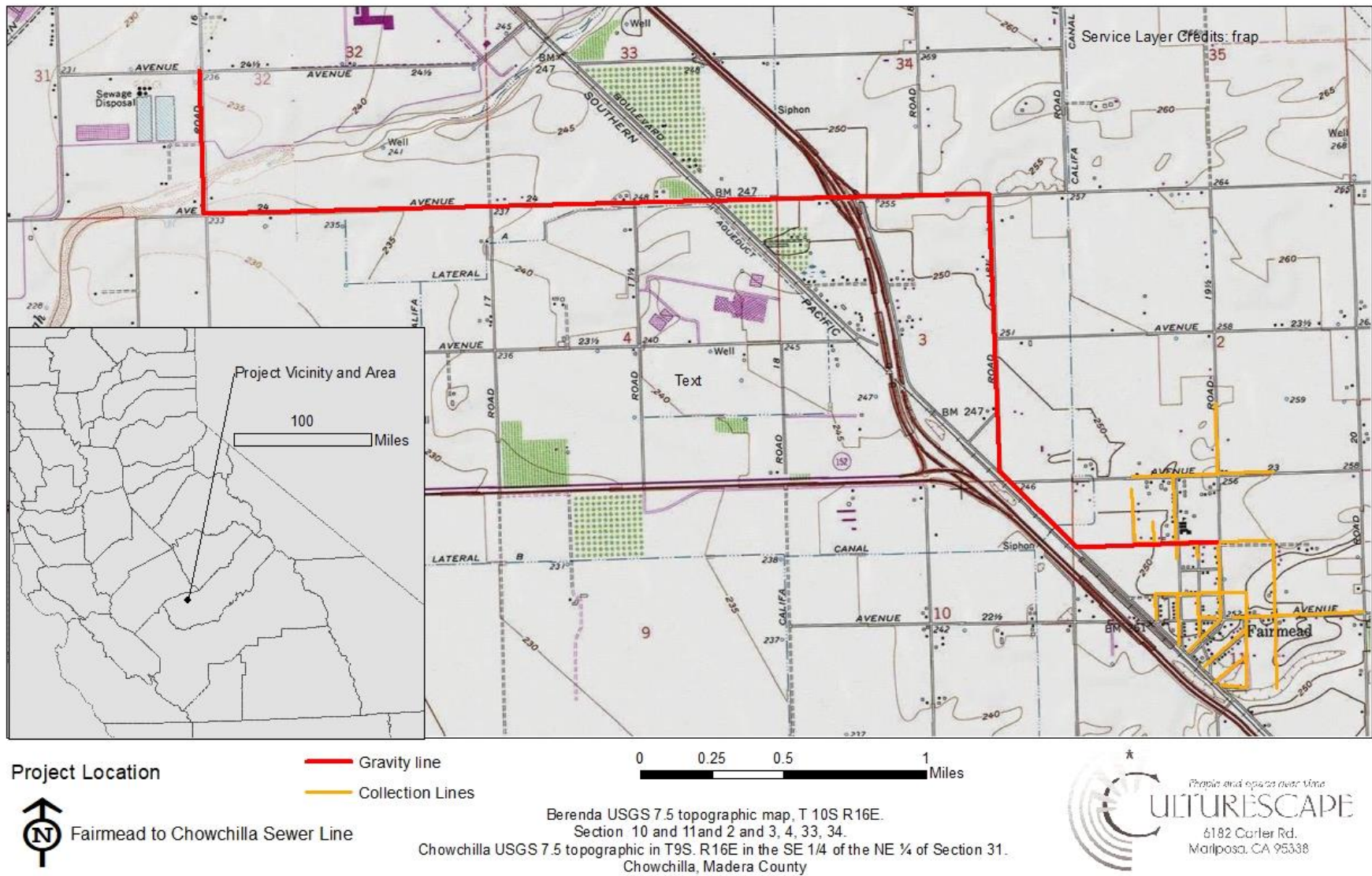


Figure 1 Project Location



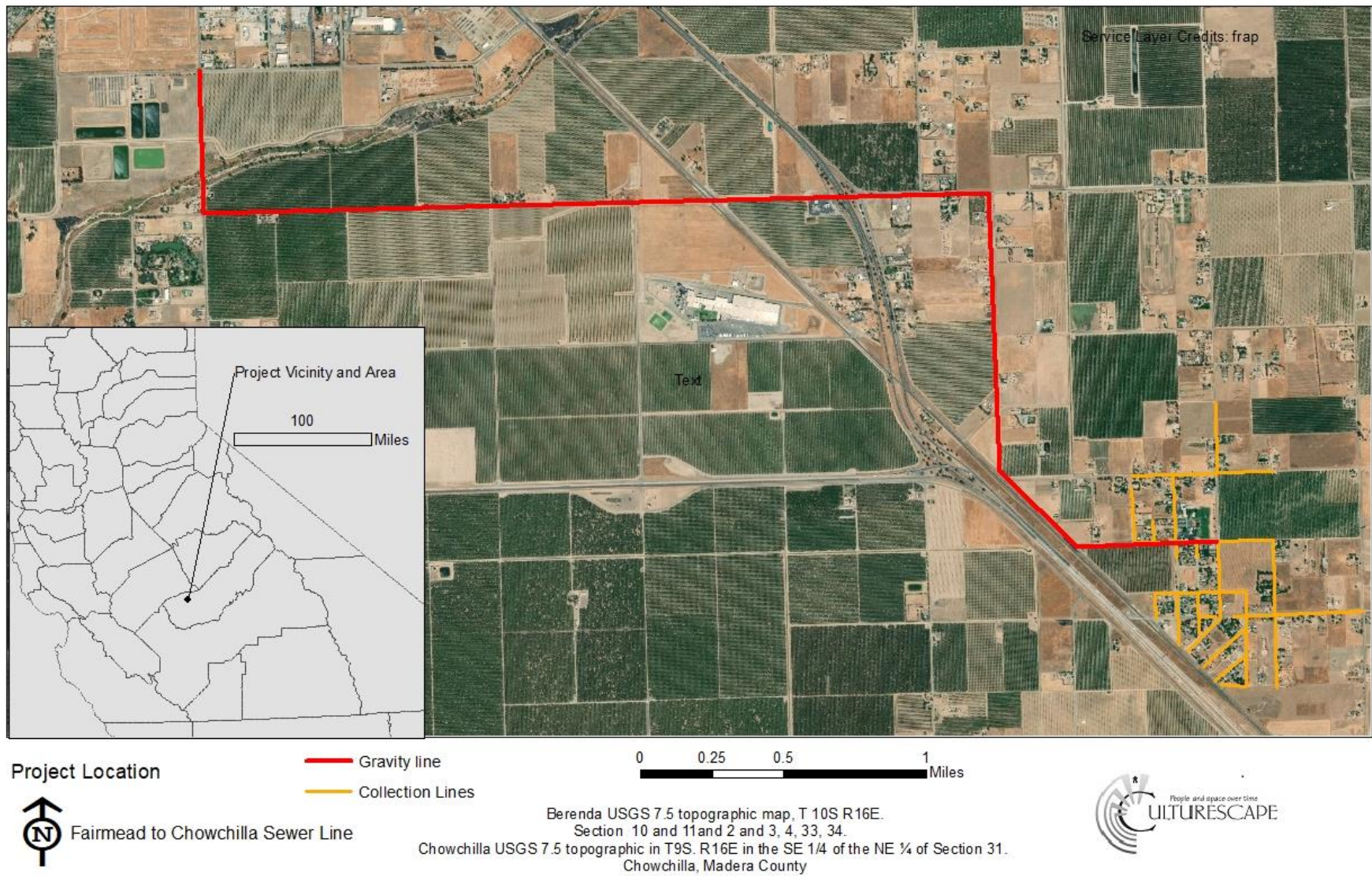


Figure 2 Project Area





Figure 3 Overview of Fairmead Project Area

## Regulatory Setting

### National Historic Preservation Act (NHPA)

Section 106 of the NHPA (1966, as amended in 2000 [36 CFR § 800]) 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 (ACHP 2013, CFR § 800.3). A *historic property* is defined as any “prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on, the NHRP, including artifacts, records and material remains related to such a property or resource” [16 USC § 470w(5)]. If an undertaking could affect historic properties, the agency determines the scope of appropriate identification efforts and proceeds to identify historic properties in the APE by applying NHRP criteria (ACHP 2013 CFR § 800.4). If any possible effects on a historic property exist, the agency, in consultation with the State Historic Preservation Officer (SHPO) and the Tribal Historic Preservation Officer (THPO), makes an assessment of adverse effects on the identified historic properties based on criteria found in ACHP’s regulations (ACHP 2013, CFR § 800.5). If adverse effects exist, the agency consults with SHPO/THPO and others to resolve adverse effects through mitigation, and a Memorandum of Agreement outlining measures the agency will take to minimize adverse effects is executed (ACHP 2013, CFR § 800.6). Federal agencies are encouraged to coordinate compliance with section 106 of the NHPA and the procedures with any steps taken to meet requirements of the National Environmental Policy Act (NEPA) for project undertakings (ACHP 2013, CFR § 800.8).

### National Register of Historic Places (NHRP) Evaluation Criteria

The National Register Designation (from the OHP website): <http://ohp.parks.ca.gov/>

NRHP eligibility determinations require an assessment of historic resources in relation to relevant historic contexts through criteria set forth in CFR § 60. The ACHP’s implementing regulations, “Protection of Historic Properties” are found in 36 CFR § 800. The NHRP criteria (36 CFR § 60.4 are used to evaluate resources complying with section 106 of the NHPA. Those criteria state that eligible resources comprise “districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and possess at least one of the following criteria:

- Is associated with events that have made a significant contribution to the broad patterns of our history (Criterion A).
- Is associated with the lives of persons significant in our past (Criterion B).
- Embodies the distinctive characteristics of a type, period or method of construction, or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction (Criterion C).
- Has yielded, or may be likely to yield, information important in history or prehistory (Criterion D).

## Eligibility Evaluation

Resources that were located as a result of survey were evaluated for their eligibility for listing in the National Register. This is listed below

### Seven Aspects of Integrity

To be included in the NRHP, a property must not only possess historical significance but also the physical means to convey such significance—that is, it must possess integrity. Integrity refers to the degree to which a resource retains its original character. Assessing the integrity of a significant resource depends on an understanding of the components or features that give it significance. For this reason, the issue of integrity is addressed only after significance has been established. Moreover, cultural resources that are not significant per NRHP criteria are by definition, not eligible for either register and do not require an integrity assessment. To facilitate this assessment, the National Park Service (NPS) has identified seven aspects of integrity.

Location is the place where the historic property was constructed or the place where the historic event occurred. . .

Design is the combination of elements that create the form, plan, space, structure, and style of a property. . .

Setting is the physical environment of a historic property. . .

Materials are the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property. . .

Workmanship is the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory. . .

Feeling is a property's expression of the aesthetic or historic sense of a particular period of time. . .

Association is the direct link between an important historic event or person and a historic property. . . [NPS 2002:44–45; emphasis added].

## Assessment of Effects

If a resource is considered to be NRHP-eligible, it is then necessary to assess whether or not the project will cause an adverse effect. In this respect, the Criteria of Adverse Effect per 36 CFR 800.5(a)(1) and (a)(2) is applied. Federal regulations define and illustrate this concept as follows:

(a)(1) An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. . .

(a)(2) Adverse effects on historic properties include, but are not limited to:

- (i) Physical destruction of or damage to all or part of the property;
- (ii) 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 of the Interior's Standards for the Treatment of Historic Properties (36 CFR Part 68) and applicable guidelines;
- (iii) Removal of property from its historic location;
  - (iv) Change of the property's use or of physical features within the property's setting that contributes to its significance;
  - (v) Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's setting that contributes to its significance;
  - (vi) 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; and
  - (vii) 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.



## California Environmental Quality Act (CEQA) Guidelines (PRC § 21084.1)

CEQA is part of PRC Sections 21000 et seq. and the CEQA Guidelines, which are the regulations governing implementation, are codified in CCR, Title 14, Chapter 3, Sections 15000 et seq. CEQA requires that state and local public agencies (Chowchilla) take into account the effects of their undertakings on historical resources. Under CEQA, a proposed project is considered to have a significant effect on the environment if it can be expected to “cause a substantial adverse change in the significance of an historical resource” (PRC § 21084.1; CEQA Guidelines, CCR § 15064.5[b]). “Projects” are activities which have the potential to have a physical impact on the environment, including cultural resources. A historical resource is a resource listed, or determined to be eligible for listing, in the CRHR, a resource included in a local register of historical resources (CCR, Title 14(3) § 15064.5[a] [2]), or any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant (CCR, Title 14(3) § 15064.5[a] [3]). PRC § 5024.1 (1-4); CCR, Title 14(3) § 4852 states that a resource is considered historically significant if it retains “substantial integrity” and meets at least one of the following criteria:

1. Is associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage
2. Is associated with the lives of persons important in our past
3. Embodies the distinctive characteristics of a type, period, region or method of installation, or represents the work of an important creative individual, or possess high artistic value
4. Has yielded, or may be likely to yield, information important in prehistory or history.

Determining integrity of a resource lies in the authenticity of that resource’s physical identity. This is judged by the survival of characteristics that were present during the resource’s period of significance. Integrity is evaluated with regard to the retention of location, design setting, materials, workmanship, feeling, and association. A “substantial adverse change” in a historic resource is a change that includes “physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired” (CEQA Guidelines, CCR, Title 14(3) § 15382).

## Background

### Natural Setting

The project area is located within the community of Fairmead, and between Fairmead and Chowchilla (Figures 1-2), two rural communities within the San Joaquin Valley. The project elevation ranges from 230 feet above mean sea level in Chowchilla to roughly 250 feet amsl in Fairmead. This is part of the Great Central Valley, which encompasses an area that is approximately 430 miles long north/south and 40 miles wide. “The Valley floor is composed of several thousands of feet of sediments deposited from runoff from the surrounding mountains” (Schoenherr 1995:516). The rainfall in this area averages between 10-12 inches per year. Agriculture and overgrazing have modified the area with the introduction of invasive weeds, and desertification over most of the area is evidenced by salt build up and polluted waterways (Schoenherr 1995:16). The Valley is divided and named for the two river systems that drain it: the Sacramento in the north and the San Joaquin in the south. This area supported a wide variety of wildlife, including elk, pronghorn, and mule deer until the advent of agriculture. Pronghorn were rare by 1875, and by 1885 only one band of elk were limited to the area around Buena Vista (Schoenherr 1995:549, 550).

The project area is in the Lower Sonoran Lifezone within the California Valley in. This had been undergone extensive agricultural development. The nearest natural water source is the Berenda Slough located about 1/4 -mile south of the Chowchilla WWTF.

### Geomorphic Setting and Buried Archaeological Potential

The proposed project area soils are of several soils associated with fan remnants. These are found trending in thin northeast bands that are interspersed throughout the project area. The primary components of these bands include: Alamo, Tujunga, Ramona, San Joaquin, Madera, Greenfield, The northern portion near the Berenda Slough includes areas with a make-up of Fresno, Hanford and Traver soils, associated with fan remnants and small areas of Atwater and Delhi soils, both associated with dunes. These soils are classified as older Pleistocene and range between 1.9 million years - 25,000 BP (Meyer, J. et al. 2010) (Attachment E: Maps [soils]).

Because of the age of the surface soils, the area has a low sensitivity to buried cultural soils (Meyers 2010) ; however, this area is extremely sensitive for paleontological materials with several major finds at very shallow depths of five feet (Attachment D: Paleontological Report).

### Archaeological Background

#### Regional Prehistory

The archaeological record within California has echoes of antiquity alleged to extend as far back as 14,000 years ago but is well established by 9,750 years ago in the southern portion of the San Joaquin Valley at Tulare Lake. These early California cultures adapted from Western Pluvial Lake Tradition (WPLT) which included fluted projectile points and flaked stone crescents along with formalized scrapers and non-obsidian debitage. Sites are generally found along “fossil lakeshores and ancient streams” (Moratto 2004:81 [1984]) while Paleo-Coastal Tradition follows similar traits of the WPLT within a time period of at least 12,000 years ago at sites on Channel Islands (Erlandson Et Al. 2007:57).

The Central Valley of California has long held the attention of California archaeologists. The earliest archaeological investigations in central California were conducted at sites in the Sacramento-San

Joaquin Delta region (Schenck and Dawson 1929). These initial reports, primarily descriptive, were followed by more systematic investigations in the 1930s-1940s by archaeologists from Sacramento Junior College and the University of California, Berkeley. This work provided the foundation for the development of chronological frameworks for central California prehistory.

The 1930s-1940s era research identified distinct temporal periods in central California prehistory and provided the basis for a chronological sequence of archaeological cultures for the region (Lillard and Purves 1936; Lillard et al. 1939). Beardsley (1948, 1954) refined the cultural succession model for central California and produced what became known as the Central California Taxonomic System (CCTS). The CCTS was divided into categories such as horizons, which are broad cultural units that are temporally and geographically discrete. Three horizons, Early, Middle, and Late, were identified for the archaeological cultures in central California.

The CCTS concentrated on material culture (e.g., burial practices), while issues related to subsistence, settlement strategies, social organization, and trade received minimal or no attention. Consequently, Gerow (1954, 1974a, 1974b; Gerow and Force 1968) questioned the utility of the CCTS and Frederickson (1973, 1974) proposed a revised taxonomic system for central California. Frederickson (1973) used specific economic and/or technological characteristics to define five patterns (i.e., Windmill, Berkeley, Borax Lake, Augustine, and Houx) for the North Coast Ranges, the San Francisco Bay and the lower Sacramento Valley. He assigned the five patterns to six periods: Paleo-Indian (10,000 to 6,000 B.C.); Lower, Middle, and Upper Archaic (6,000 B.C. to A.D. 500); and Upper and Lower Emergent (A.D. 500 to 1800).

### Local Archaeological Phases

Among problems that arose with the CCTS is that it was far overreaching and did not fully illustrate subtle change or sub-regional trends, and was therefore misleading: “variability in the archaeological record is not easily accommodated by the horizon scheme” (Moratto 2004:199 [1984]).

Three basic time periods, Paleo-Indian, Archaic, and Emergent were proposed by Willey and Phillips in 1958 and this was later modified using new radiocarbon determinations to include five divisions, Paleo-Indian (11,550 to 8550 cal B.C.), Lower Archaic (8550 to 5550 cal B.C.), Middle Archaic (5550 to 550 cal B.C.), Upper archaic (550 cal B.C. to cal A.D. 1100), and Emergent (cal A.D. 1100 to Historic) (Rosenthal ET AL. 2007:150).

The depth of the archaeological record within the San Joaquin Valley extends to the limits of documented occupation within California. The majority of fluted points with estimated dates between 11,550 and 9,550 RCYBP, uncalibrated dates on human bone at 15,802 BP, and faunal materials without a clear association at 17,745 RCYBP have been located around the shores of the Tulare Lake Basin (Rosenthal, Et Al. 2007:151; Justice 2002:76). Although there is a lack of evidence for direct correlation of human and faunal remains, based on “typologic grounds the Clovis-like points argue for occupation of the ancient Lake Tulare vicinity earlier than 11,000 B.P. (Moratto 2004:82). The study of archaeology of the Central Valley has been limited in part because of the destruction of surface sites through agriculture and because of the deposition of alluvium (Rosenthal, Et Al. 2007:150). The finds around the Tulare Basin are a result of uplifted buried lake deposits caused by “Holocene earthquake activity . . . along the Dudley Ridge” (Justice 2002:76).

The transitional period between the Pleistocene and the Holocene showed extreme changes to the climate and in turn flora and fauna. This promoted adaptations in survival strategies throughout the west (Moratto 2004:90; Rosenthal ET AL. 2007:151, 152). The intensification of plant resources began to take place with evidence along foothill sites indicated by a substantial increase in milling equipment. This is not as evident in the Valley locations. There does appear to have been “two distinct settlement-subsistence adaptations operating in central California beginning in the Middle Archaic, one centering on the foothills and the other on the Valley floor” (Rosenthal ET AL. 2007:152,153). The foothill traditions show an increase in procurement of plant material, primarily pine nuts and acorns. This adaptive subsistence included a high residential mobility. The Valley on the other hand began to see occupation along the river corridors and evidence of semi-permanent residence, which included “refined and specialized tool assemblages and features, a wide range of non-utilitarian artifacts abundant trade objects, and plant and animal remains indicative of year-round occupation”. By 4050 cal B.C. milling equipment was being used in the Valley with a possible increase in fishing and further intensification of marshland resources occurring during the Middle Archaic. This period also saw an increase in exchange of shell and obsidian (Rosenthal ET AL. 2007).

Middle Archaic deposits are rare in the Central Valley in part due to the inflow of depositional materials in the early Holocene, with these fans stabilizing roughly around 5550 cal B.C. Archaeology in the Central Valley south of Stockton is still “the least-known area of California, Deep alluvium and the destruction of surface sites for agriculture have in part, led to this lack of information. The areas of Tulare Lake and Buena Vista have been shown to have “cultural affiliations with the Santa Barbara Coast and the Mojave Desert” (Moratto 2004:215).

By the late Middle Archaic, groups had begun to find stability along river corridors in both the Sacramento and San Joaquin Valleys (Rosenthal ET AL. 2007:153) based on mortuary practices, with Valley groups periodically occupying locations in the foothills along riparian areas (Rosenthal ET AL. 2007:156). Intensification of the resources of the Valley led to increased population (Wohlgemuth 2010:57-76) and at the same time a reduction in the rate of animal production after 770 A.D. (Rosenthal ET AL. 2007:162).

## Ethnography

### Yokuts

The area of the proposed site is linked to the Yokuts who were linguistically associated to Penutian speakers. These included the Costanoan, Miwok, Wintun, Maidu, and Yokuts (Heizer and Elasser 1980:137). The estimate for the time depth based on “the small phonological and morphological differences among Yokuts subgroups . . . indicates a relatively recent date for proto-Yokuts, probably between 1,500 and 1,000 years ago” (Golla 2007:76) While they could understand each other, the dialect of this group varied from the northern to the southern end of the San Joaquin Valley.

Sutton (2010:3-30) has proposed that an earlier language group of Uto-Aztecan was pervasive in The Great Central Valley based on similarities of language and burial patterns in Central Coastal California. He has suggested that this language group was a remnant of an earlier sub-group known as Takic, previously referred to as “Shoshonean” language that was originally called “The Southern California” branch. Based on these and previous studies, it is thought that this language group originated in the

southern foothills of the Sierra Nevada and that these groups occupied the Southern San Joaquin Valley in the Middle Holocene (Sutton 2010:6).

“To the north of the Chumash, there is some linguistic evidence of ‘ancient and long-term contact’ between Salinian and Uto-Aztecan . . . This contact may have been severed by the entry of Yokuts into the San Joaquin Valley (circa 3000 cal B.P.)” [Sutton 2010:8].

The Yokuts held territory “from the San Joaquin Valley floor from the mouth of the San Joaquin River south to Tehachapi Pass to the lower Sierran foothills south of the Fresno River and the lower Kern and Kings River lands in the southern valley” (Heizer and Elasser 1980:14-15). There were at least 50 distinct tribes within this area of approximately 250 by 100 miles (Heizer and Elasser 1980:15, 16; Kroeber 1976:475; Heizer and Whipple 1971:370). The Yokuts differed from other groups in that “They are divided into true tribes” . . . each has a name, a dialect, and a territory” (Heizer and Whipple 1971:369; Kroeber 1976:474). The area of the “valley edge and the foothill margin, particularly towards the better-watered Sierra slopes to the east...” led to denser populations south of the Fresno River (Heizer and Whipple 1971:91). While these groups were somewhat mobile to reflect changes in resource availability, some areas were occupied by particular groups “with sufficient permanence to become identified with it” (Heizer and Whipple 1971:370). Individual Yokut groups identified with their name or village more than with the Yokuts as a whole. The area around Madera has been identified as land occupied by the Hoyima with the Pitkachi to the south and the Chowchilla to the north (Smith 1960:7; Wallace 1978:466).

### Historical Background/ Affiliations

The first Europeans to reach the interior valleys were deserting Spanish soldiers from San Diego in 1772 and although there were no permanent settlements the interior valley became well known (Smith, 1976: preface). By 1807 the mission system along the coast was well in place and at this time an expedition under the command of Color-Sergeant Gabriel Moraga was sent into the interior to locate mission sites. This expedition closely followed the present route of Highway 99. This expedition continued east along Mariposa Creek. It was on this expedition that Moraga located the Merced River and proposed this area as a possible mission site (Smith 1939/1976:36; Bingaman 1968:2). On a second expedition in 1810 Moraga reversed this decision (Smith, 1976:38).

In 1814 Sargent Ortega, Padre Cabot and thirty men conducted an expedition reaching the village of Bupal on the southern shore of Tulare Lake. The village contained an estimated 700 residents. The expedition continued north along the Kings River and although the area lacked timber for the construction of large buildings, Cabot recommended this area near the river was suitable for a mission (Smith 1976:42). Several expeditions occurred between 1815 and 1822; however, tribal people were uncooperative and would flee when approached by the Spanish, leading to hostilities between the two. After spending some time in the Porterville area Moraga moved south along the Kern River (Smith 1962:37).

The Mission system was devastating to the Native American populations California. Diseases not endemic to California including measles, smallpox, as well as syphilis reduced the population from an estimated 300,000 in 1769, to around 200,000 by 1821. During the gold rush it fell to 150,000 and continued to fall drastically. A measles epidemic in 1833 decimated whole villages leaving large portions of the San Joaquin void of people (Hurtado, 1988:1; Moratto 2004:323,324). It is estimated that during

the mission period that populations between San Francisco and San Diego declined over seventy five percent (Rawls, 1984:18). The Indians resisted by fleeing with livestock into the interior valley and several expeditions were sent to recapture runaways and to recover stolen stock. Horses became an asset to both the Yokut and Miwuk both in hunting elk and antelope but also in resisting Spanish incursions into the Central Valley (Hurtado 1988:32-36).

The majority of California was considered unoccupied or Indian territory. Ranchos and missionary development remained clustered in small areas. Effort to secularize the California missions began as early as 1813 having the effect of weakening the mission control of land and by 1834 was California law (Robinson 1979: 29, 30). In 1848, the Treaty of Guadalupe Hidalgo was signed annexing California from Mexico. This treaty recognized the right of California Native Americans “to occupy their lands until voluntary relinquishment”. The policy at this time until 1878 was to recognize the tribes as nations and to enter into treaties with them as such (Robinson 1979:13, 14; Cossley-Batt 1928:133-141, Rawls 1984:148). None of these were ratified. By signing the treaties, the tribes agreed to move to areas in reserve. These areas were contested by whites in the area, this and failure of Indians to present claims for their property in front of the Land Commissioners resulted in the loss of future claims for the property and these lands reverted to public domain (Robinson 1979:15,16).

The creation of Madera County occurred in 1893 from the northern part of Fresno County, with Madera becoming the county seat (Smith 1960: 357). One of the “original” owners of the land around Madera was Isaac Friedlander; these holdings were later divided and became the John Brown Colony (Smith 1960: 177). The John Brown Colony was established in 1890 and began cultivating grapes but failed in a financial downturn of the 1890’s (Barcroft 1933).

Among these settlers were Dr. Joseph Borden and George Washington Mordecai. The former plantation owners were among the first farmers in the area Mordecai was responsible for the creation of Madera County (Rehart 1999: 96, 97), while the first Southern Pacific Station in the area was named for Borden (Gudde 1962:34). Other investors in the area included Henry Miller of the Miller Lux Cattle company eventually purchasing 145,000 acres primarily in the western portion of the county (Barcroft 1933). Ten years after Miller’s death, up to 100,000 acres to the west were divested. However, lands along the San Joaquin River were still held.

The development of irrigation within the San Joaquin and in particular, Madera County, created a tremendous influx of persons that benefitted from the increase in agriculture. The overall period of significance for the development of agricultural colonies often referred to as the “Farmers Movement” in the San Joaquin Valley had its roots as far back as 1868 with the founding of an Irish colony near Woodville, and the creation of the Alabama Colony. The evolution of segregated colonies that included nationality, race, religion, or political affiliation continued within the San Joaquin Valley. Private investment and the development of real estate promotion began as early as 1868 with the purchase of 80,000 acres of Agricultural College Script located in the Fresno area by William S. Chapman and his associates along with the development of several colonies including the Central Colony, a model for future developments (Smith 1976: 414). The California Colonization project began in the late 1800’s and early 1900’s as for-profit efforts to establish farming colonies. The evolution of real estate speculation and the development of agricultural colonies continued into the 1920’s finally passing out of favor after the depression in 1929 .



Chowchilla was founded by O. A. Robertson, who had become interested in land development, establishing the United States Farm Land Company with offices in Sacramento, Winnipeg, St. Paul and Denver (City of Chowchilla 2020). Robertson invested his entire fortune of 4 million into the development by purchasing Chowchilla Ranch from the California Pastoral & Agricultural Company. Chowchilla started construction at the same time as Fairmead (Eissinger 2013: 10).

The growth of Fairmead began in 1912, by the Co-operative Land and Trust Company, a real-estate development firm headed by J. S. Cone and A. M. Thompson. Started in 1904, the firm was responsible for colonization projects around the City of Merced, the Jordan-Atwater tracts, the Livingston Colony and the town of Winton (Eissinger 2017:51, 52). The land used for the Fairmead colony was a portion of the Sharon Estate that included almost 60,000 acres. Fairmead was advertised by M.C. Coats in 1912, "The establishment of a town at this point is creating a great deal of interest for it will be the only large town between Madera and Merced and will be the shipping point for more than 60,000 acres . . . Fine markets and good neighbors mean independence health, and happiness to the man who locates on the 20 acre diversified farm" [Eissinger 2017: 52]. The development included a train depot that saw 18 freight and passenger trains a day. Fairmead was initially settled by Anglo-Americans and flourished because of shallow wells and a well-established infra-structure for the development. Lots began to be sold in November of 1912:

[Fairmead] will soon be one of the most important agricultural points in Madera County. It is the business center of the Fairmead district... Fairmead is now assuming all the proportions of a modern town. Its future is assured... The streets are wide, a water system has been installed, and water is piped throughout the town. Several blocks of cement sidewalks and curbs are already laid, and the cement and street grading work are still at work.

A new business block is nearing completion... Plans for another business block are being drawn up and work will be commenced on this building within a short time (San Francisco Chronicle Editorial Staff 1912). [Eissinger 2017:63, 63]

The short boom of Fairmead included the construction of a post office, two churches, an elementary school a local paper, a movie theater, a large hotel, a lumber yard, a blacksmith shop a cheese factory, an insurance company and a pool hall. The hotel burned in 1914 and the building declined shortly after with the town in recession by the early 1920's with most businesses closed or moved to Madera or Chowchilla (Eissinger 2017:66).

It began to suffer the same fate as the surrounding agricultural properties as the wells began to give out. "As white settlers moved out during the 1920's and 1930's, African American families moved in" (Eissinger 2013: 9). The transition to cotton during the war years presented an opportunity for Anglo-American migrant farmers escaping the dust bowl and they made up most of the population of Madera County remaining the dominant population until 1948 (Autabee 1994: 19).

Fairmead located just one mile north of the Madera Irrigation Canal did not benefit from the system. Discriminatory practices by the banks in Madera and Chowchilla, would not make loans to blacks, so while there was the possibility to work for white or black landowners that had purchased land using alternative loans, there was little possibility of financial stability and the town went into decline .While

the majority of Fairmead was made up of persons of color, Chowchilla remained exclusively white until the early 1960's (Eissinger 2013: 9, 10).

## Research Design/Methodology

Research consisted of a records search of recorded historical and archaeological sites and maps of the affected area by personnel at the Southern San Joaquin Information Center (SSJVIC), a literature review of historic and archaeological data pertaining to the area in question, and a field survey. Native American Correspondence was pursued for information regarding the area only. The County is consulting with the Native American Heritage Commission and affected tribes under AB 52 (Attachment A: Native American Consultation).

### Information Center Records Search

Records Search # 20-142 from the California Historical Resources Information System's Southern San Joaquin Valley Information Center (SSJVIC) at California State University, Bakersfield on April 13, 2020 encompassed the project area plus all land within a 0.5-mile radius of the project. SSJVIC staff consulted archaeological site and survey base maps, reports of previous investigations, cultural resource records, the listings of the National Register of Historic Places, the Historic Property Data File (March 3, 2013), the California Historical Landmarks, the California Register of Historical Resources, the California Inventory of Historic Resources, and the California Points of Historical Interest (Attachments B: Record Search).

## Report of Findings:

### Records Search Results

The records search conducted by the SSJVIC resulted in no previously reported cultural resources within the project area. Six cultural studies have been conducted within the project area, with an additional six taken place in proximity (within ½ mile). Studies within the project area include:

**MA-00027** 1996 Ananian, B. Letter Report for an Archaeological Reconnaissance of the Fairmead Sewer Improvement Project.

**MA-00083** 1995 Cultural Resources Inventory Report for the Proposed Mojave Northward Expansion Project Woodward-Clyde Consultants Hatoff, Brian, Voss, Barb, Waechter, Sharon, Wee, Stephen, and Benté, Vance NADB-R – 1140863.

**MA-00264**, 1977 Cartier, R Cultural Resource Evaluation for the Fairmead Colony Acres in the City of Chowchilla, County, California.

**MA 00266** 1987 Chavez, D. Cultural Resources Investigations for the Madera County Women's Prison Project, Madera County, California.

**MA-00306**, 1991 Cultural Resources Investigation of the CCSI Madera, Inc. Materials Recovery Facility Project Sites A and B, Approximately 60 Acres in Chowchilla and Fairmead, Madera County, California.

The six studies conducted within a ½- mile radius included:

**MA-00142** 1999 Benning, J. Negative Archaeological Survey Report Installation of Traffic Surveillance Stations along Interstate 5, State Route 41, and State Route 99 in Madera and Fresno Counties.

**MA- 00317** 1994 Osborne R. Negative Archaeological Survey Report: Roadway Rehabilitation on E. Route 152 from Merced Co. Line to Madera PM 15.6.

**MA-00399** 1988 Werner R.H. A Cultural Resources Investigation of the Fairmead Landfill Expansion Project, Madera County, California.

**MA-00934** 2001 Nadolski J. Archaeological Investigations for Tower Modifications at 34 Cell Tower Sites.

**MA-00939** 2000 Hattersley-Davidson Karana Historic Resources Evaluation Report and Historic Architectural Survey Report for Fairmead Freeway Conversion, State Route 99, Madera County

**MA-00939A** 2002 Unknown Finding of No Adverse Effect State Route 99 Fairmead Conversion and Interchange Project

**MA-00946** 2002 Wren D.G. An Archaeological Survey Madera County Solid Waste Facilities Project

### [Tribal Correspondence](#)

Correspondence with the Native American Heritage Commission (NAHC) was conducted for information only. The AB 52 process was conducted by the City of Chowchilla. (Attachment A: Native American Consultation)

### [Phase I Survey](#)

A pedestrian survey was conducted on April 29, 2020 along neighborhood streets within Fairmead including (from west to east: First Street, Maple, Elm, Road 19 ¾, Hickory, Sycamore, and Alder. (From south to north) Avenue 22 ½, Yates Avenue, Avenue 22 ¾, Avenue 23. And finally, roads trending from southwest to north east Sinclair, (a historic through fare), Palm Street, and Arnott. The survey continued along Fairmead Boulevard north to Road 18 ¾ to Avenue 24. Avenue 24 was surveyed where visibility allowed to Road 16 where it was terminated at Avenue 24 ½. Visibility varied from poor to good where fields had been recently plowed, however, several fields we fallowed with no opportunity. Residential areas within Fairmead provided good ground surface visibility, although several residences were landscaped with property fences, limiting the search to the margin of roadways.

### [New Resources](#)

#### [Landscape features from the original town layout of Fairmead](#)

Sinclair Street and Maple Street exhibit landscape features from the original town layout from 1912. These were recorded as Fairmead Feature 1 and 2 (the original boulevards with palm tree-lined medians). The median on Maple Street begins half-way up the block and continues for 1550' to Avenue 22 ¾ with breaks at Moore Avenue, Yates Avenue and Avenue 22 ½. The second median on Sinclair extends for approximately 665' with a break at Fairmead Circle and Elm Street. A third median located on Avenue 22 ¾ has been transformed into the school parking lot, with the curb feature s extending for 625' between Maple Street and Road 19 ½. These were recorded using the appropriate Department of

Parks and Recreation (DPR)523 forms. These features were evaluated to determine their eligibility for inclusion in the National Register of Historic Places (NRHP) and The California Register of Historic Resources (CRHR). While this feature is significant under Criterion 1 of the CRHR, for the initial development of Fairmead, because of a lack of historic integrity to convey this significance these are recommended as ineligible for inclusion in either the CRHR or NRHP. Furthermore, construction will not impact either of these features.

### Eligibility Evaluation and Assessment of Effects

Evaluating resources to determine whether they are eligible for inclusion in the NRHP and CRHR is described in Chapter 1, Section 106 of the NHPA and CEQA and require government agencies to consider potential effects/impacts to NRHP- and/or CRHR-eligible properties, whereas such consideration is not necessary for non-eligible resources. The first threshold in this determination is to ascertain whether the sites satisfy the age criterion for national and state registers. Consistent with 36 CFR 60.4, to be eligible for these registers, an archaeological or built-environment resource must be 50 years or older. Except under exceptional circumstances (National Park Service [NPS] 2002:25–43), sites less than 50 years old are dismissed from further consideration. The National Park Service (NPS) has established guidelines for evaluating eligibility of resources meeting the age criterion (NPS 2002). The basic steps in the process include:

1. classifying the resource as a district, archaeological site, building, structure, or object;
2. determining the theme, context, and relevant thematic period of significance to which the resource is associated;
3. determining whether the resource is historically important under a set of significance criteria; and
4. (if significant) determining whether the resource retains integrity

### Classification

The features represent the original layout for the Cooperative of Fairmead. This was created in 1912, is more than 50 years old, and thus meets the NRHP age criterion (36 CFR 60.4) to be considered a cultural resource. More specifically, it is a contributing factor of a linear structure, under the guidelines of the Office of Historic Preservation (1995); this category includes transmission lines, roads, railroads, gas lines, and features with similar properties.

### Context, Theme and Thematic/Resource Period of Significance

The medians are associated with local county history under the theme of Town Site Properties creation and evolution, and Agricultural Properties with sub-themes of land cooperatives, and “The Farmers Movement” during the early 1900s.

The overall period of significance for the development of agricultural colonies often referred to as the “Farmers Movement” in the San Joaquin Valley had its roots as far back as 1868 with the founding of an Irish colony near Woodville, and the creation of the Alabama Colony. The evolution of segregated colonies continued within the Valley that included nationality, race, religion, or political affiliation. Private investment and the development of real estate promotion began as early as 1868 with the purchase of 80,000 acres of Agricultural College Script located in the Fresno area by William S. Chapman and his associates and the development of several colonies which included the Central Colony, a model

for future developments (Smith 1976:414). The California Colonization project began in the late 1800's and early 1900's as for-profit efforts to establish Farming colonies. The evolution of real estate speculation and the development of agricultural colonies continued into the 1920's finally passing out of favor after the depression in 1929.

#### *Application of Significance of Criteria*

##### *Criterion A/1*

Comparisons were made of aerial photography from 1946, 1958, and 1998 and historic U.S. Department of the Interior/ U.S. Geological Survey (USGS) maps 1916, 1918 Berenda, 1: 31,680; 1961 1:24,000 Berenda 7.5 Quadrangle, 1961 PR 1987 1:24,000 Berenda 7.5 Quadrangle (Topo View Website). The location remains the same. The features are significant under Criterion A/1 for their association with the private development of agricultural colonies in Madera County and the evolution of these communities based on the availability of water in the San Joaquin Valley.

##### *Criterion B/2*

The features, the planning and construction was done by unknown contractors. The resource is not eligible under Criterion B/2.

##### *Criterion C/3*

The features and do not demonstrate an innovative or unique quality. This location is not considered eligible under Criterion C/3.

##### *Criterion D/4*

There is little chance the features can offer additional value regarding its history, or how any further study will enhance what has been documented previously elsewhere. This location is not considered significant under Criterion D/4

#### *Assessment of Integrity*

The National Register recognizes seven aspects, or qualities, that define integrity. To convey their historic integrity, properties will possess several, if not most, of the aspects, including location, design, setting, materials, workmanship, feeling, and association. An eligible property must be able to convey the historic character and sense of time during which it attained its significance. Location refers to the place where an event occurred or a property was originally built. Design considers elements such as plan, form, and style of a property. Setting is the physical environment of the property. Materials refer to the physical elements used to construct the property. Workmanship refers to the physical evidence of craftsmanship. Feeling is the ability of the property to convey its aesthetic or historic sense of a particular period of time. Association refers to the link between the property and a historical event or person.

Comparisons were made of aerial photography from 1946, 1958, and 1998 and historic U.S. Department of the Interior/ U.S. Geological Survey (USGS) maps 1916, 1918 Berenda, 1: 31,680; 1961 1:24,000 Berenda 7.5 Quadrangle, 1961 PR 1987 1:24,000 Berenda 7.5 Quadrangle (Topo View Website).

The location remains the same. In consideration of the four criteria provided by the NRHP these retain significance under Criterion A/1. The following discussion regards the integrity of the element following the guidelines of the seven aspects of integrity as discussed by the NPS (2002)

The features display good Integrity of association and location, while the conditions for material, design and workmanship are fair. The development of Fairmead has been quite different than what was envisioned in 1912 with the community evolving as an unincorporated settlement, abandoning the original plan, while retaining some of the original elements. Most of the original buildings are gone and the surrounding area includes modern agricultural practices that have reduced setting and feeling to poor.

The boulevards retain very good Integrity of association as the roadways remains active in their primary purpose as an access route within the community. The location of these features agree with historic locations; however, both Sinclair Street and Maple Street exhibit limited development of the road whereas only one side is paved at this time except for a small segment on Maple Street between Avenue 22 ½ and Yates Avenue. The original two-lane boulevard along Avenue 22 ¾ between Maple Street and Road 19 ½ has been altered; while the medians remain, the roadway has been abandoned and incorporated into the school parking lot. The remaining portion is located on the shoulder of the roadway at the south side of the athletic field. It appears that these areas may have not been fully developed beyond the initial layout.

#### Integrity of materials

The features retain integrity of materials, however, a lack of caretaking and the age of the trees has impacted the integrity of the median. The curbs remain intact within the first block east of Fairmead Boulevard that includes Maple Street, Elm Street and, Sinclair and Avenue 22 ½. There is also a sidewalk feature along Maple Street to Avenue 22 ¾. however, it does not appear as if these were fully implemented as was plotted on the 1916 map or that some of these have been removed or altered as the community grew and thus, reducing the Integrity of workmanship to fair.

#### Integrity of Design

This remains similar to its original concept at this location, however, some of the original thoroughfares have been abandoned. The sidewalks appear to be intact, but again, the area does not appear to be developed beyond the first block between Fairmead Boulevard and along Maple Street.

The evolution of Fairmead from a success story of a promotional farming colony to a poverty-stricken community in such a short period of time is directly related to real estate promotion, the availability of water in the area, and to the racial divide that was present in the Central Valley at the time. Little remains of the original Fairmead or of the buildings constructed after the influx of black inhabitants in the 1920's. The parcels themselves within the development are small lots with modern homes. This is complimented by small ranchettes that average between 1 to ten acres. The surrounding area is occupied with Agribusinesses such as almonds or pistachios which occupy large tracks of land. Irrigation is responsible for changes from annual crops of wheat, vegetables, and cotton to more permanent and water dependent crops like fruit and nut orchards. So, while the area has remained agricultural, other elements have changed reducing the Integrity of setting to average.

The development of irrigation in Madera County was driven by early shortcomings to supply water to a growing area in an equitable and efficient manner. This has led to a dynamic organization that continually seeks to upgrade its water delivery system. Agricultural practices have also changed the



landscape from open pasture or small farms to uni-crop production such as almond or pistachio orchards. For this reason, Integrity of feeling is considered lacking.

### Adverse Effects Criteria

The precise footprint of the pipe alignment has not been determined; however, it will be within the public right-of-way and can be expected to vary from side to side of the road to avoid existing utilities. The area of disturbance may be up to 20' either side of the road. This may have an impact to the sidewalk features. Construction will not compromise historical medians or their function as they will not be impacted. However if portions of the historic roadways have remained unpaved over the years, it is possible that sheet layers of historic materials may be located within the fill material of the roadway and perhaps contain important information regarding the evolution of Fairmead, or to elucidate varying ethnographic use of the area as those transformations occurred.

### Assessment of Integrity

In consideration of Section 106 regulations per 36 CFR 800.5 (a) (1) define an adverse effect in terms of a loss of integrity to the characteristics that “qualify the property for inclusion in the National Register.” That is, an effect (or change) to the resource or its surroundings by itself does not necessarily constitute an adverse effect; to be considered adverse, it must diminish the ability of the resource to convey its significance. The surrounding land has been impacted by the trend to larger farms with uni-crops such as almonds or pistachio. Modern houses have also been constructed in close proximity and these have all impacted the integrity of features. In addition, the roads have been altered or abandoned along with additional housing and roads being built south southeast of Sinclair. The features themselves are limited in their ability to convey the significance of Fairmead as they are remnants of a failed real estate venture.

## Comments /Recommendations

Fairmead Feature 1, 2 and 3 represent the original infrastructure of a for-profit planned colony during the California Colonization period during the Farmers Movement in the early 1900s. While the development of the early infrastructure, that included water and electricity to each home and business, drew early success and acclaim, both were short-lived with the depletion of shallow water wells and the failure to acquire water from local canal systems. Instead of a town that developed more complexity, Fairmead is an example of a plan that did not achieve its planned potential. The transition from a community of German and Russian Mennonites to that of impoverished persons of color is difficult to follow as it is a case of attrition with regard to facilities and infrastructure with the exodus of business and opportunity.

These features were evaluated to determine their eligibility for inclusion in the National Register of Historic Places (NRHP) and The California Register of Historic Resources (CRHR). While these features are significant under Criterion 1 of the CRHR, for the initial development of Fairmead, because of a lack of historic integrity to convey this significance, these are recommended as ineligible for inclusion in either the CRHR or NRHP. Furthermore, construction will not impact of these features, however, associated sidewalks may be impacted by the placement of the pipeline.

It may be possible to recover data contained in sheet deposits within the fill on the undeveloped portion of the historic roadways. It is therefore suggested that an archaeological monitor be present

during subsurface work on Maple Street, Sinclair Street, Elm Street, and Avenue 22 ½, Avenue 23 ¾ and Yates Avenue or at a minimum, a cultural resources tailboard should take place with those responsible for work prior to earthwork.

### General Recommendations

Should any prehistoric or historical components be uncovered, that is, resources possessing physical evidence of human activities over 45 years old, then all work is to stop and a qualified professional of the appropriate discipline is to be contacted to evaluate the discovery.

Should human remains be encountered during ground disturbance, as provided by Health and Safety Code section 7050.5., then all work is to stop until the county coroner can determine whether the remains are subject to provisions of the Government Code. Pursuant to the Public Resources code 5097.98, if the coroner finds that the remains are not subject to his or her authority and if the coroner recognizes the human remains to be Native American, the coroner has 24 hours to contact the Native American Heritage Commission. They will contact the most likely descendent who will make recommendations on how to proceed. The most likely descendent has twenty-four hours to respond. If the most likely descendent does not respond in twenty-four hours, the owner may reinter the remains in an area off the property and secure from further disturbance. If the owner doesn't accept the descendant's recommendations, the owner or the descendent may request mediation by the Native American Heritage Commission.

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#### Other Sources

USGS

2020 Topoview website (accessed 5/5/2020)

<https://ngmdb.usgs.gov/topoview/>

1916 1:31680 Berenda

1918 1:31680 Berenda

1948 1:24,000 Berenda 7.5 Quadrangle

1961 1:24,000 Berenda 7.5 Quadrangle

1961 PR 1987 1:24,000 Berenda 7.5 Quadrangle

## Attachment A: Native American Consultation



## Attachment B: Record Search

California Historical Resources Information System

**CHRIS Data Request Form**

**ACCESS AND USE AGREEMENT NO.:** 72 **IC FILE NO.:** \_\_\_\_\_

To: Southern San Joaquin Valley Information Center

Print Name: Mark Kile Date: 4/1/2020

Affiliation: Culturescape

Address: 6182 Carter Rd.

City: Mariposa State: CA Zip: 95338

Phone: 209 966 3327 Fax: 209 966- Email: \_\_\_\_\_

Billing Address (if different than above): \_\_\_\_\_

Billing Email: \_\_\_\_\_ Billing Phone: \_\_\_\_\_

Project Name / Reference: Fairmead / Chowchilla sewer line expansion

Project Street Address: NA linear

County or Counties: Madera

Township/Range/UTMs: T 10S R16E. T9S. R16E.

USGS 7.5' Quad(s): Berenda, Chowchilla,

PRIORITY RESPONSE (Additional Fee): yes ☐ / no ☐

TOTAL FEE NOT TO EXCEED: \$ \_\_\_\_\_  
(If blank, the Information Center will contact you if the fee is expected to exceed \$1,000.00)

Special Instructions: \_\_\_\_\_

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**Information Center Use Only**

Date of CHRIS Data Provided for this Request: \_\_\_\_\_

Confidential Data Included in Response: yes ☐ / no ☐

Notes: \_\_\_\_\_

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4/13/2020

Mark Kile  
Culturescape  
6182 Carter Road  
Mariposa, CA 95338

Re: Fairmead / Chowchilla Sewer Line Expansion  
Records Search File No.: 20-142

The Southern San Joaquin Valley Information Center received your record search request for the project area referenced above, located on the Berenda USGS 7.5' quad. The following reflects the results of the records search for the project area and the 0.5 mile radius:

As indicated on the data request form, the locations of archaeological resources and reports are provided in the following format: ☐ custom GIS maps ☐ shapefiles

Archaeological resources within project area:	None
Archaeological resources within 0.5 mile radius:	None
Reports within project area:	MA-00027, 00083, 00264, 00266, 00306, 01026
Reports within 0.5 mile radius:	MA-00142, 00317, 00399, 00934, 00939, 00946

*Note: Report locations were not mapped per the Data Request Form.*

**Resource Database Printout (list):** ☐ enclosed ☐ not requested ☒ nothing listed

**Resource Database Printout (details):** ☐ enclosed ☒ not requested ☐ nothing listed

**Resource Digital Database Records:** ☐ enclosed ☒ not requested ☐ nothing listed

**Report Database Printout (list):** ☒ enclosed ☐ not requested ☐ nothing listed

**Report Database Printout (details):** ☐ enclosed ☒ not requested ☐ nothing listed

**Report Digital Database Records:** ☐ enclosed ☒ not requested ☐ nothing listed

**Resource Record Copies:** ☐ enclosed ☐ not requested ☒ nothing listed

**Report Copies:** ☐ enclosed ☒ not requested ☐ nothing listed

**OHP Built Environment Resources Directory:** ☒ enclosed ☐ not requested ☐ nothing listed

**Archaeological Determinations of Eligibility:** ☐ enclosed ☒ not requested ☐ nothing listed

**CA Inventory of Historic Resources (1976):** ☐ enclosed ☐ not requested ☒ nothing listed

<b><u>Caltrans Bridge Survey:</u></b>	Not available at SSJVIC; please see <a href="http://www.dot.ca.gov/hq/structur/strmaint/historic.htm">http://www.dot.ca.gov/hq/structur/strmaint/historic.htm</a>
<b><u>Ethnographic Information:</u></b>	Not available at SSJVIC
<b><u>Historical Literature:</u></b>	Not available at SSJVIC
<b><u>Historical Maps:</u></b>	Not available at SSJVIC; please see <a href="http://historicalmaps.arcgis.com/usgs/">http://historicalmaps.arcgis.com/usgs/</a>
<b><u>Local Inventories:</u></b>	Not available at SSJVIC
<b><u>GLO and/or Rancho Plat Maps:</u></b>	Not available at SSJVIC; please see <a href="http://www.glorerecords.blm.gov/search/default.aspx#searchTabIndex=0&amp;searchByTypeIndex=1">http://www.glorerecords.blm.gov/search/default.aspx#searchTabIndex=0&amp;searchByTypeIndex=1</a> and/or <a href="http://www.oac.cdlib.org/view?docId=hb8489p15p;developer=local;style=oac4;doc.view=items">http://www.oac.cdlib.org/view?docId=hb8489p15p;developer=local;style=oac4;doc.view=items</a>
<b><u>Shipwreck Inventory:</u></b>	Not available at SSJVIC; please see <a href="http://www.slc.ca.gov/Info/Shipwrecks.html">http://www.slc.ca.gov/Info/Shipwrecks.html</a>
<b><u>Soil Survey Maps:</u></b>	Not available at SSJVIC; please see <a href="http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx">http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx</a>

Please forward a copy of any resulting reports from this project to the office as soon as possible. Due to the sensitive nature of archaeological site location data, we ask that you do not include resource location maps and resource location descriptions in your report if the report is for public distribution. If you have any questions regarding the results presented herein, please contact the office at the phone number listed above.

The provision of CHRIS Data via this records search response does not in any way constitute public disclosure of records otherwise exempt from disclosure under the California Public Records Act or any other law, including, but not limited to, records related to archeological site information maintained by or on behalf of, or in the possession of, the State of California, Department of Parks and Recreation, State Historic Preservation Officer, Office of Historic Preservation, or the State Historical Resources Commission.

Due to processing delays and other factors, not all of the historical resource reports and resource records that have been submitted to the Office of Historic Preservation are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for historical resource management work in the search area. Additionally, Native American tribes have historical resource information not in the CHRIS Inventory, and you should contact the California Native American Heritage Commission for information on local/regional tribal contacts.

Should you require any additional information for the above referenced project, reference the record search number listed above when making inquiries. Invoices for Information Center services will be sent under separate cover from the California State University, Bakersfield Accounting Office.

Thank you for using the California Historical Resources Information System (CHRIS).

Sincerely,

**Celeste M. Thomson**  Digitally signed by Celeste M. Thomson  
Date: 2020.04.13 11:46:37 -07'00'

Celeste M. Thomson  
Coordinator

## Report List

SSJVIC Record Search 20-142

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
MA-00027	NADB-R - 1141202	1996	Ananian, Benjamin	Letter Report for an Archaeological Reconnaissance of the Fairmead Sewer Improvement Project	Individual Consultant	
MA-00083	NADB-R - 1140863	1995	Hatoff, Brian, Voss, Barb, Waechter, Sharon, Wee, Stephen, and Benté, Vance	Cultural Resources Inventory Report for the Proposed Mojave Northward Expansion Project	Woodward-Clyde Consultants	20-002122
MA-00142		1999	Binning, Jeanne Day	Negative Archaeological Survey Report Installation of Traffic Survelance Stations along Interstate 5, State Route 41, and State Route 99 in Madera and Fresno Counties	California Department of Transportation	
MA-00264		1991	Cartier, Robert	Cultural Resource Evaluation for the Fairmead Colony Acres in the City of Chowchilla, County, California	Archaeological Resource Management	
MA-00266		1987	Chavez, David	Cultural Resources Investigations for the Madera County Women's Prison Project, Madera County, California	David Chavez and Associates	
MA-00306		1991	Napton, L. Kyle	Cultural Resources Investigation of the CCSI-Madera, Inc. Materials Recovery Facility Project Sites A and B, Approximately 60 Acres in Chowchilla and Fairmead, Madera County, California	California State University, Stanislaus	
MA-00317	Caltrans - 06-MAD-152 PM 0.0/15.6 CU 169 EA 338601; NADB-R - 1140933	1994	Osborne, Richard	Negative Archaeological Survey Report: Roadway Rehabilitation on E. Route 152 from Merced Co. Line to Madera PM 15.6	California Department of Transportation	
MA-00399		1988	Werner, Roger H.	A Cultural Resources Investigation of the Fairmead Landfill Expansion Project, Madera County, California	Archaeological Services	
MA-00934		2001	Nadolski, John A.	Archaeological Investigations for Tower Modifications at 34 Cell Tower Sites	Pacific Legacy, Inc.	
MA-00939	Caltrans - 06-MAD-99, P.M. 19.8/22.3, EA 06-293300; OHP PRN - FHWA010327A	2000	Hattersley-Drayton, Karana	Historic Resources Evaluation Report and Historic Architectural Survey Report for Fairmead Freeway Conversion, State Route 99, Madera County	California Department of Transportation	20-002487, 20-002488, 20-002489, 20-002490, 20-002491
MA-00939A		2002	Unknown	Finding of No Adverse Effect State Route 99 Fairmead Conversion and Interchange Project	California Department of Transportation	
MA-00946		2002	Wren, Donald G.	An Archaeological Survey Madera County Solid Waste Facilities Project	Individual Consultant	

## Report List

SSJVIC Record Search 20-142

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
MA-01026	Submitter - SWCA Cultural Resources Report Database No. 06-507; Submitter - SWCA Project No. 10715- 180	2006	Arrington, Cindy, Bass, Bryon, Brown, Joan, Corey, Chris, and Hunt, Kevin	Cultural Resources Final Report of Monitoring and Findings for the Qwest Network Construction Project, State of California	SWCA Environmental Consultants	
MA-01026A		2000	SWCA Environmental Consultants	Qwest Fiber Optic Project Cultural Resources Protocols	SWCA Environmental Consultants	



## Attachment C: New Site Records

## Attachment D: Paleontological Report

## Attachment E Photographs

## Photo Log Fairmead /Chowchilla Sewer Line

Date	Time	Subject	Fig	Accession Number	Direction
4/29/2020	8:00	Overview of Sycamore Road from the west	1	P4290009	east
4/29/2020		Overview of Hickory Street	2	P2400010	north
4/29/2020		Overview of Avenue 22 ½ at Road 19 ½	3	P4290011	north
4/29/2020		Overview of Avenue 22 ½ at Road 19 ½	4	P4290012	east
4/29/2020		Overview of historic boulevard at Sinclair Street from Avenue 22 1/2	5	P4290013	SW
4/29/2020		Overview of Avenue 22 ½ from Sinclair	6	P4290014	west
4/29/2020		Overview of Arnott Street looking northwest	7	P4290015	NW
4/29/2020		Overview of Fairmead Boulevard from Arnott	8	P4290016	north
4/29/2020		Overview of Fairmead Boulevard from Arnott	9	P4290017	south
4/29/2020		Overview of First Street from Avenue 22 ½	10	P4290018	north
4/29/2020		Overview of Yates Street from First Street	11	P4290019	east
4/29/2020		Overview of Maple Street with Historic Median with palm trees	12	P4290020	north
4/29/2020		Maple Street from Fairmead Boulevard. Note sidewalk feature at right	13	P4290021	north
4/29/2020		Overview of Elm Street from Avenue 22 ½	14	P4290022	north
4/29/2020		Overview of Maple with historic palms from Yates	15	P4290023	north
4/29/2020		Old Italian Cypress on Yates	16	P4290024	south
4/29/2020		Overview of Avenue 22 ½ from Elm	17	P4290025	west
4/29/2020		Overview of Avenue 22 ½ from Elm	18	P4290026	east
4/29/2020		north	19	P4290027	east
4/29/2020		Yates	20	P4290028	west
4/29/2020		Overview of open field adjacent to the water facility	21	P4290029	east
4/29/2020		Overview of Palm Street from Hickory Street	22	P4290030	SW
4/29/2020		Overview of Road 22 ¾ from Maple Street	23	P4290031	east
4/29/2020		Overview of Road 22 ¾ from Maple Street	24	P4290032	west
4/29/2020		Overview of Maple Street from Road 22 ¾	25	P4290033	south
4/29/2020		Overview of Maple Street from Road 22 ¾	26	P4290034	north
4/29/2020		Overview of First Street from Road 22 ¾	27	P4290035	north
4/29/2020		Overview of Alder Street from road 22 ¾	28	P4290036	north
4/29/2020		Duplicate		P4290037	
4/29/2020		Overview of Avenue 23 from Alder	29	P4290038	east
4/29/2020		Overview of Road 23 looking east of Avenue 19 ½	30	P4290039	west
4/29/2020		Overview of Avenue 22 ¾ from Fairmead Boulevard	31	P4290040	east
4/29/2020		Overview of Avenue 22 ¾ from Fairmead Boulevard	31	P4290040	east

4/29/2020		Overview of Fairmead Boulevard at Road 22 ¾	32	P4290042	south
4/29/2020		Overview of Road 18 3/4	33	P5010013	south
4/29/2020		Overview of Road 18 3/4	34	P5010014	north
4/29/2020		Overview of Avenue 24 at Road 18 3/4	35	P5010015	west
4/29/2020		Overview of Avenue 24 at Fairmead Boulevard	36	P4290046	
4/29/2020		Bridge No.-41-0054	37	P4290047	
4/29/2020		Overview of Ave 24 at Chowchilla Boulevard	38	P4290048	west
4/29/2020		Overview of Ave 24 at midpoint	39	P4290049	east
4/29/2020		Overview of Ave 24 at midpoint	40	P4290050	west
4/29/2020		Overview of Road 16 at Avenue 24 ½	41	P4290051	east
4/29/2020		Overview of Road 16 at Avenue 24 ½	42	P4290053	north
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4/29/2020		Overview of Sycamore Street at Avenue 22 ¾	44	P4290055	west
		Overview of Avenue 22 ¾ at Sycamore west	45	P4290056	west
4/29/2020		Overview of Avenue 22 ¾ from Road 19 ½	46	P4290057	west
4/29/2020		Overview of Elm Street from Avenue 22 ¾	47	P4290058	south
4/29/2020		Overview of Arnoff at Fairmead Boulevard	48	P4290059	north



Figure 4 Overview of Sycamore Road from the west

P4290009

east



*Figure 5 Overview of Hickory Street*

P2400010

north



*Figure 6 Overview of Road 19 1/2 at Avenue 22 1/2*

P4290011

north





Figure 7 Overview of Avenue 22 1/2 at Road 19 1/2

P4290012

east



Figure 8 Overview of historic boulevard at Sinclair Street from Avenue 22 1/2

P4290013

SW



Figure 9 Overview of Avenue 22 ½ from Sinclair

P4290014

west



Figure 10 Overview of Arnott Street looking northwest

P4290015

NE





Figure 11 Overview of Fairmead Boulevard from Arnott

P4290016

north



Figure 12 Overview of Fairmead Boulevard from Arnott

P4290017

south



Figure 13 Overview of First Street from Avenue 22 ½ 10 P4290018 north



Figure 14 Overview of Yates Street from First Street 11 P4290019 east





Figure 15 Overview of Maple Street with historic median with palm trees 12 P4290020 north



Figure 16 Maple Street from Fairmead Boulevard. Note sidewalk feature at right 13 P4290021 north



Figure 17 Overview of Elm Street from Avenue 22 ½ 14 P4290022 north



Figure 18 Overview of Maple with historic palms from Yates 15 P4290023 north





Figure 19 Old Italian Cypress on Yates Avenue 16 P4290024 south



Figure 20 Overview of Avenue 22 1/2 from Elm 17 P4290025 west



Figure 21 Overview of Avenue 22 ½ from Elm 18 P4290026 east



Figure 22 Overview of Yates road from Elm 19 P4290027 east





*Figure 23 Overview of Yates Road P4290028 west*



*Figure 24 Overview of open field adjacent to the water facility (Yates)*

21 P4290029 east





Figure 25 Overview of Palm Street from Hickory Street 22 P4290030 SW



Figure 26 Overview of Road 22 1/4 from Maple Street 23 P4290031 east





Figure 27 Overview of Road 22 ¼ from Maple Street      24      P4290032      west



Figure 28 Overview of Maple Street from Road 22 ¼      25      P4290033      south





Figure 29 Overview of Maple Street from Road 22 ¼ 26 P4290034 north



Figure 30 Overview of First Street from Road 22 ¼ 27 P4290035 north





Figure 31 Overview of Alder Street from road 22 ¼ 28 P4290036 north



Figure 32 Overview of Avenue 23 from Alder 29 P4290038 east



Figure 33 Overview of Road 23 looking east of Avenue 19 ½ 30 P4290039 west



Figure 34 Overview of Avenue 22 ¾ from Fairmead Boulevard 31 P4290040 east





Figure 35 Overview of Fairmead Boulevard at Road 22  $\frac{3}{4}$  32 P4290042 south



Figure 36 Overview of Road 18  $\frac{3}{4}$  33 P5010013 south





Figure 37 Overview of Road 18 3/4 34 P4290044 north



Figure 38 Overview of Avenue 24 at Road 18 3/4 35 5010014 west





Figure 39 Overview of Avenue 24 at Fairmead Boulevard 36 P4290045 west



Figure 40 Bridge No.-41-0054 37 P4290046 Southwest



Figure 41 Overview of Ave 24 at Chowchilla Boulevard 38 P4290048 west



Figure 42 Overview of Ave 24 at midpoint 39 P4290049 east





Figure 43 Overview of Ave 24 at midpoint 40 P4290050 west



Figure 44 Overview of Road 16 at Avenue 24 1/2 41 P4290051 east



Figure 45 Overview of Road 16 at Avenue 24 ½ 42 P4290053 north



Figure 46 Overview of Sycamore Street at Avenue 20½ north P4290054





Figure 47 Overview of Sycamore Street at Avenue 22 ¼ 44 P4290055 south



Figure 48 Overview of Avenue 22 ¼ at Sycamore west 45 P4290056 west



Figure 49 Overview of Avenue 22 ¼ from Road 19 ½ 46 P4290057 west



Figure 50 Overview of Elm Street from Avenue 22 ¼ 47 P4290058 south





Figure 51 Overview of Arnoff at Fairmead Boulevard 48 P4290059 north

## Attachment F Qualifications



## Summary of qualifications

Mr. Kile's 15 years' experience with some of California's leading cultural resource management firms, and as a private consultant includes all phases of archaeological investigations of prehistoric and historical resources; evaluations of sites, mines, logging activity, railroads, irrigation, and hydro-electric projects for compliance with the California Environmental Quality Act (CEQA), the National Environmental Policy Act (NEPA), and the National Historic Preservation Act (NHPA). Mr. Kile's experience includes project design, personnel management, multi-party project coordination and working knowledge of Federal, State and County laws.

## Areas of Expertise:

- A working knowledge of California Environmental Quality Act
- National Environmental Policy Act
- National Historic Preservation Act
- Consultation with Native American groups and concerned persons
- Preparation of Archaeological Research Design proposals,
- Preparation of Archaeological Technical Reports

records searches, site plotting, rectifying field records, field transects, excavation, mapping, recordation, laboratory analysis, organization of site records, use of Total Station, and Geographical Information Systems.

## Relevant Experience

### **Principal Investigator, County of Madera, the Mid-Town Connector,**

Extended Phase I Investigation of CA-MAD-2824/H. The purpose of the investigation was to determine vertical and horizontal extent of the site through positive identification or negative sampling of cultural materials only.

Phase II evaluation of the site to determine the eligibility of the resource for entry into the California Inventory of Historic Places

### **Principal Investigator, Central Valley Independent Network, The Central Valley Next Generation Broadband Infrastructure Project, Cultural Resource Inventory, Auburn, Ca. 2015 Culturescape** Phase I and report for fiber optic transmission lines.

### **Principal Investigator, Cultural Resources Inventory for Hillview Water Company Infrastructure Improvements, Raymond, Ca. 2015 Culturescape** Phase I survey and report for compliance of the California Environmental Quality Act for requirements of the California Department of Public Health (CDPH) Proposition 50 Water Improvement Grant.

### **Principal Investigator, Historical Properties Survey Report and Archaeological Survey Report for Tully Road Reconstruction STPL 5411 (014) Hughson, Stanislaus County Ca. 2014 Culturescape.** Phase I survey and report for compliance with FHWA guidelines.

### **Field Technician, Field Survey for Historic Resources Evaluation Report for the North County Corridor Project. Oakdale, Stanislaus County. Ca. 2014, LSA** Phase I survey of historical buildings for the evaluation of eligibility for inclusion into the National Register.

### **Principal Investigator, Cultural Inventory for 13-MPRO-191 WaterSmart Grant for Madera Irrigation District Water Conservation, Telemetry and Delivery System Management Improvement Project, Madera County California. 2013 Culturescape**

Phase I Survey in conjunction with a Bureau of Reclamation grant to replace manual controls and gauges with automated flume gates and flow meters. This included research into California irrigation and generally focused on built environment.

**Principal Investigator, Avoidance of Site CA-COL-245/H (NTIA 101004A) Colusa, California. Central Valley Independent Network. The Central Valley Next Generation Broadband Infrastructure Project 2013 Culturescape** Phase III Investigation. This research was conducted in an effort to avoid a previously located site within downtown Colusa and to determine if there were undisturbed cultural deposits for the purpose of securing a viable route for fiber optics cables. The project consisted of excavation of 8 test units from 1 X 1 meters to 2 X 1 meters that were excavated to a depth of 2.5 meters. The conclusion was that this substrata was disturbed throughout the proposed route.

**Principal Investigator, , Cultural Resource Inventory, Evaluation and Cultural Mitigation of APN 092-030-100 El Dorado County, California for Central Valley Independent Network, The Central Valley Next Generation Broadband Infrastructure Project 2013 Culturescape**, Extended Phase I Investigation and evaluation of two sites affected by a bentonite spill

**Principal Investigator, Preconstruction Survey for Apex Natural Renewable Generation LLC. Proposed Solar Farm, Orange Cove, Tulare County, Ca. 2013 Culturescape** Phase I Survey for a proposed solar farm.

**Project Archaeologist, Gil Ranch Storage LLC, Madera County, Ca. 2009 ENTRIX**

This project consisted of placement of 26.5 miles of pipeline for a natural gas storage facility in Madera County. Investigations included monitoring, coordinating with GRS management and various construction crews on a daily basis and coordination with Native American Monitors during excavations through recorded sites. Daily reports were used for compliance with the California Public Utilities Commission, Army Corp of Engineers, and Office of Historic Preservation

**Field Supervisor, Sweetwater Mine Evaluation. Mariposa County 2006, Applied Earthworks**

Field supervision and assessment of mine property for evaluation for eligibility for inclusion into the National Register of Historic Places. Reports for this project complied with Caltrans requirements California Environmental Quality Act and Section 106 of the Nation Historic Preservation Act

**Field Supervisor, San Joaquin/ Big Dreamer Mine Evaluation North Fork, Madera County, 2006, Applied Earthworks.**

Duties included field supervision and assessment of mine property for evaluation for eligibility for inclusion into the National Register of Historic Places. Reports for this project complied with Caltrans requirements California Environmental Quality Act and Section 106 of the Nation Historic Preservation Act

**Field Supervisor, Seismic Retrofit of the Crane Valley Dam. Bass Lake 2006, Applied Earthworks**

This project was for the seismic retrofit of buttresses for the Crane Valley Dam.

Tasks included relocation and record updates of historic and prehistoric features for mitigation purposes including modification to forest roads and development of quarries for buttress materials.

**Principal Investigator, CALTRANS Contract 10- OP7704 Emergency Road Widening for Ferguson Slide, Highway 120 Priest Grade 2006 Culturescape**

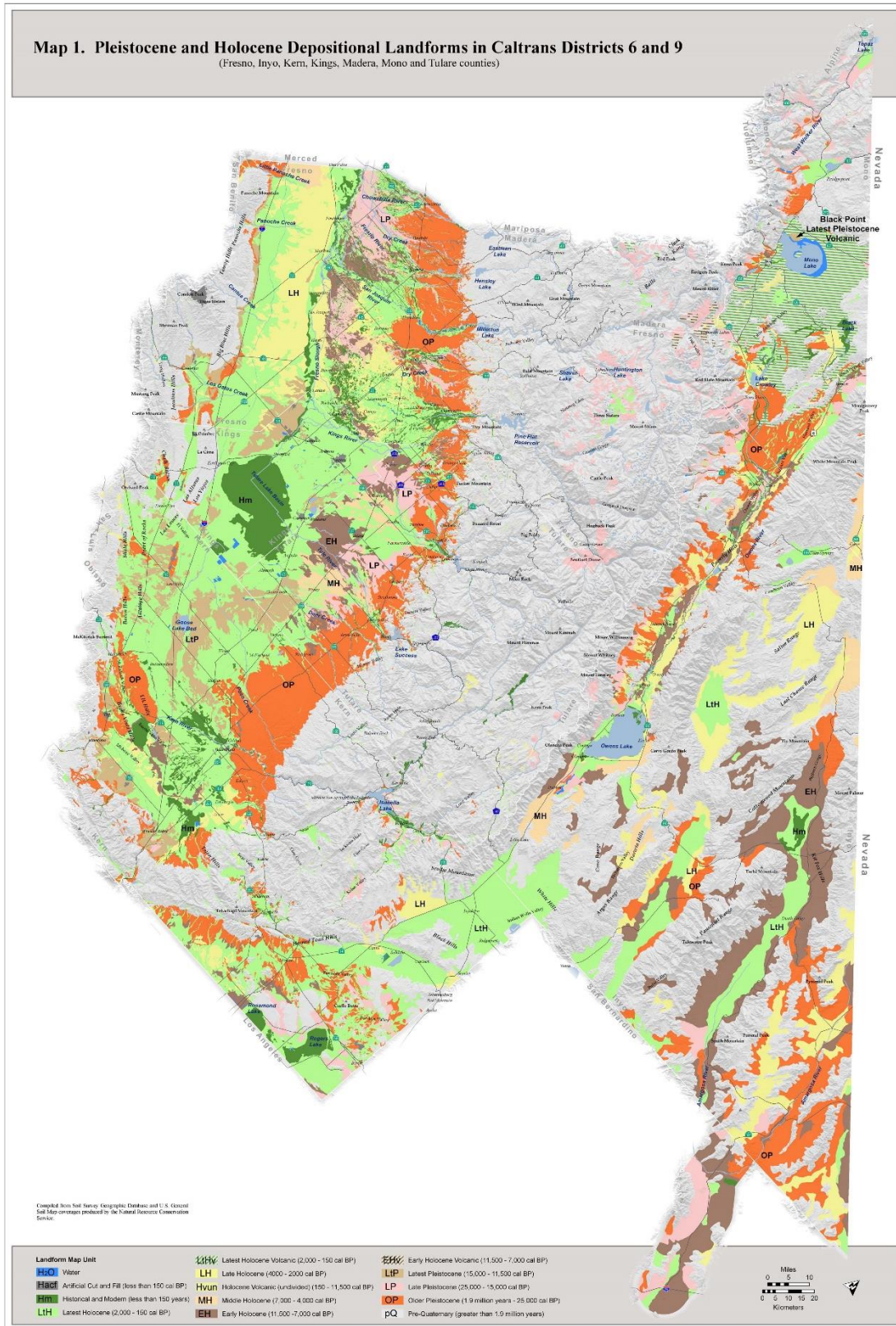
This project consisted of monitoring emergency road widening conducted as a result of the landslide of Ferguson Ridge on highway 140 in Mariposa County. Duties included recordation of mine trails subsumed by highway construction and identification of historic and prehistoric artifacts. Reports for this project complied with Caltrans requirements California Environmental Quality Act and Section 106 of the Nation Historic Preservation Act

**Field Technician** Auburn/Truckee, Applied Earthworks, Field Technician Yuba/ Bear River, Phase I FERC re-licensing. Duties included location and identification of prehistoric and historic features such as mining apparatus, ditches, cabin structures, and historic trash scatters that related to dams within the P.G. and E system, and the Overland trail. Bowman Lake, Faucherie, French Lake, Rollins Lake, Sawmill Lake, Scotts Flat and Jackson Lake were all surveyed.



## Attachment G: Maps

**Map 1. Pleistocene and Holocene Depositional Landforms in Caltrans Districts 6 and 9**  
(Fresno, Inyo, Kern, Kings, Madera, Mono and Tulare counties)



*Figure 52 Pleistocene and Holocene Depositional Landforms in Caltrans District 6 and 9*



**Map 2. Buried Archaeological Potential in Caltrans Districts 6 and 9**  
(Fresno, Inyo, Kern, Kings, Madera, Mono and Tulare counties)

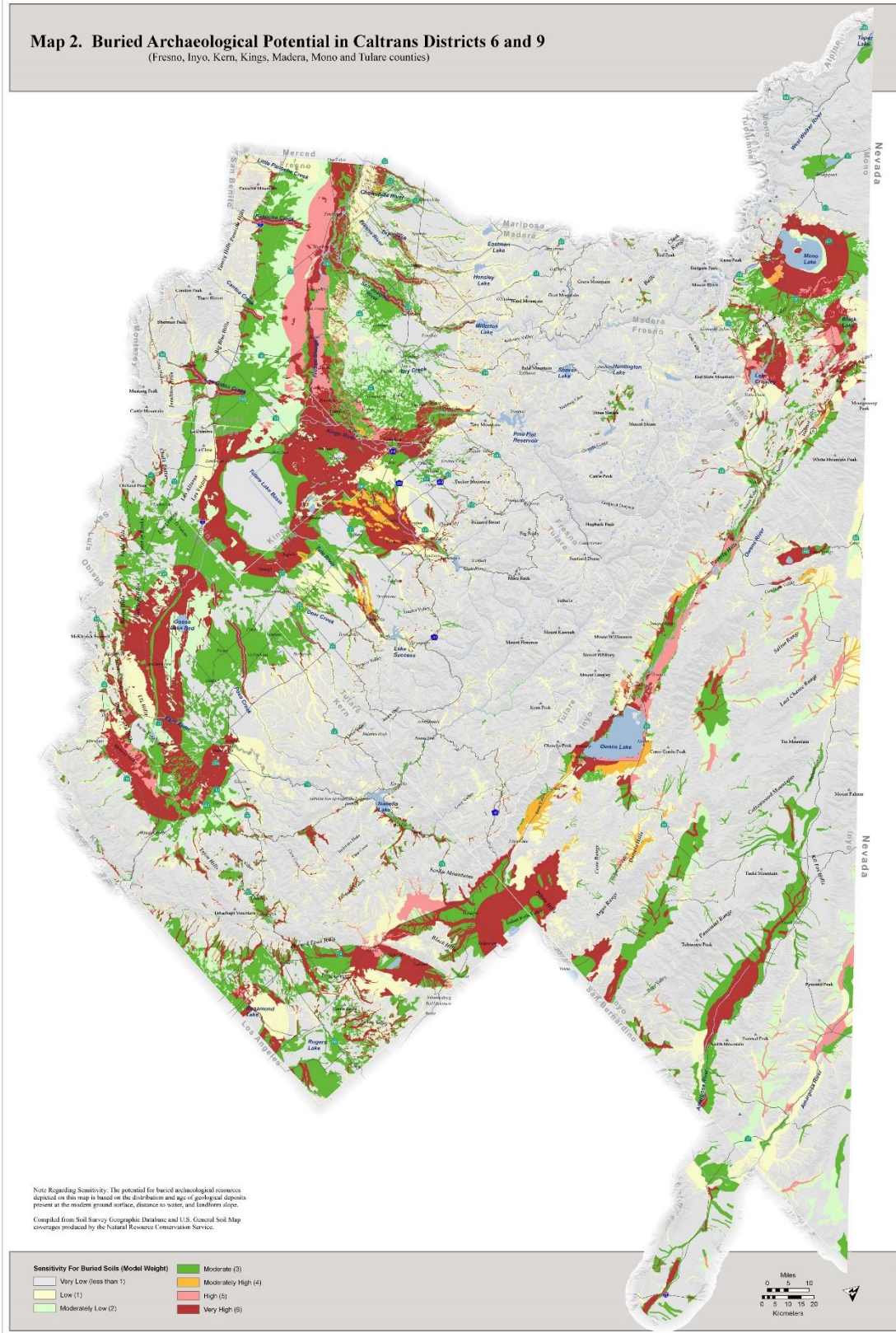


Figure 53 Buried Archaeological Potential in Caltrans District 6 and 9





**APPENDIX F**  
**PALEONTOLOGICAL RESOURCES TECHNICAL REPORT**



**PALEOSERVICES**  
SAN DIEGO NATURAL HISTORY MUSEUM

## Paleontological Resources Technical Report

Fairmead to Chowchilla Sewer Line  
Madera County, California

May 6, 2020

*Prepared for:*

CultureScape  
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# Executive Summary

This Paleontological Resources Technical Report was prepared for the proposed Fairmead to Chowchilla Sewer Line project (Project), which proposes to extend sewer collection services from the City of Chowchilla to the unincorporated community of Fairmead in western Madera County, California. The purpose of this report is to identify and summarize paleontological resources that occur along the Project alignment, identify potential Project construction elements that may negatively impact paleontological resources, and provide recommendations to minimize any potential impacts.

The Project alignment extends from the community of Fairmead, located along the northeast side of State Route (SR) 99, west to Fairmead Boulevard, northwest to Road 18  $\frac{3}{4}$ , north to Avenue 24, west to Road 16, and north to the City of Chowchilla's existing Wastewater Treatment Facility (WWTF), located at 15750 Avenue 24  $\frac{1}{2}$ . As proposed, the Project will construct approximately 5 miles of new sewer collection lines and a new sewer lift station in the community of Fairmead, a total of 4.7 miles of new force sewer main and gravity sewer main to connect the new collection lines to the City of Chowchilla's WWTF, and an additional 0.9 MGD package treatment plant and improvements at the WWTF in order to accommodate the additional wastewater flow from Fairmead.

The Project alignment is adjacent to the western foothills of the central Sierra Nevada, where Cenozoic sedimentary strata of the San Joaquin Valley are lapped on to the plutonic igneous rocks of the Sierra Nevada Batholith. The Project alignment is underlain by Pleistocene alluvial deposits associated with the Quaternary Chowchilla River alluvial fan. Included in this sequence are, from youngest to oldest: the Modesto Formation and Riverbank Formation, which are mapped at the surface along the Project alignment, and the Turlock Lake Formation, which is likely present in the relatively shallow subsurface along the Project alignment.

The results of the paleontological records search and literature review indicate that scientifically important Rancholabrean- and Irvingtonian-age vertebrate fossil assemblages fossils have been recovered from the Modesto and Riverbank formations and the Turlock Lake Formation, respectively. Fossil localities from these geologic units are known from the nearby Fairmead Landfill, from the City of Chowchilla, and from SR-99 south of Merced, as well as elsewhere in the northern San Joaquin Valley.

Following the paleontological potential criteria developed by the Society of Vertebrate Paleontology (SVP, 2010), the Modesto Formation, Riverbank Formation, and Turlock Lake Formation all are assigned a high paleontological potential. As such, Project-related earthwork taking place within previously undisturbed deposits of these geologic units has the potential to impact paleontological resources. Therefore, implementation of a paleontological mitigation program centered around paleontological monitoring is recommended, as outlined in the provided recommended mitigation measures. Implementation of the paleontological mitigation program will effectively minimize any Project-related impacts to paleontological resources.

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# 1.0 Introduction

## 1.1 Project Description

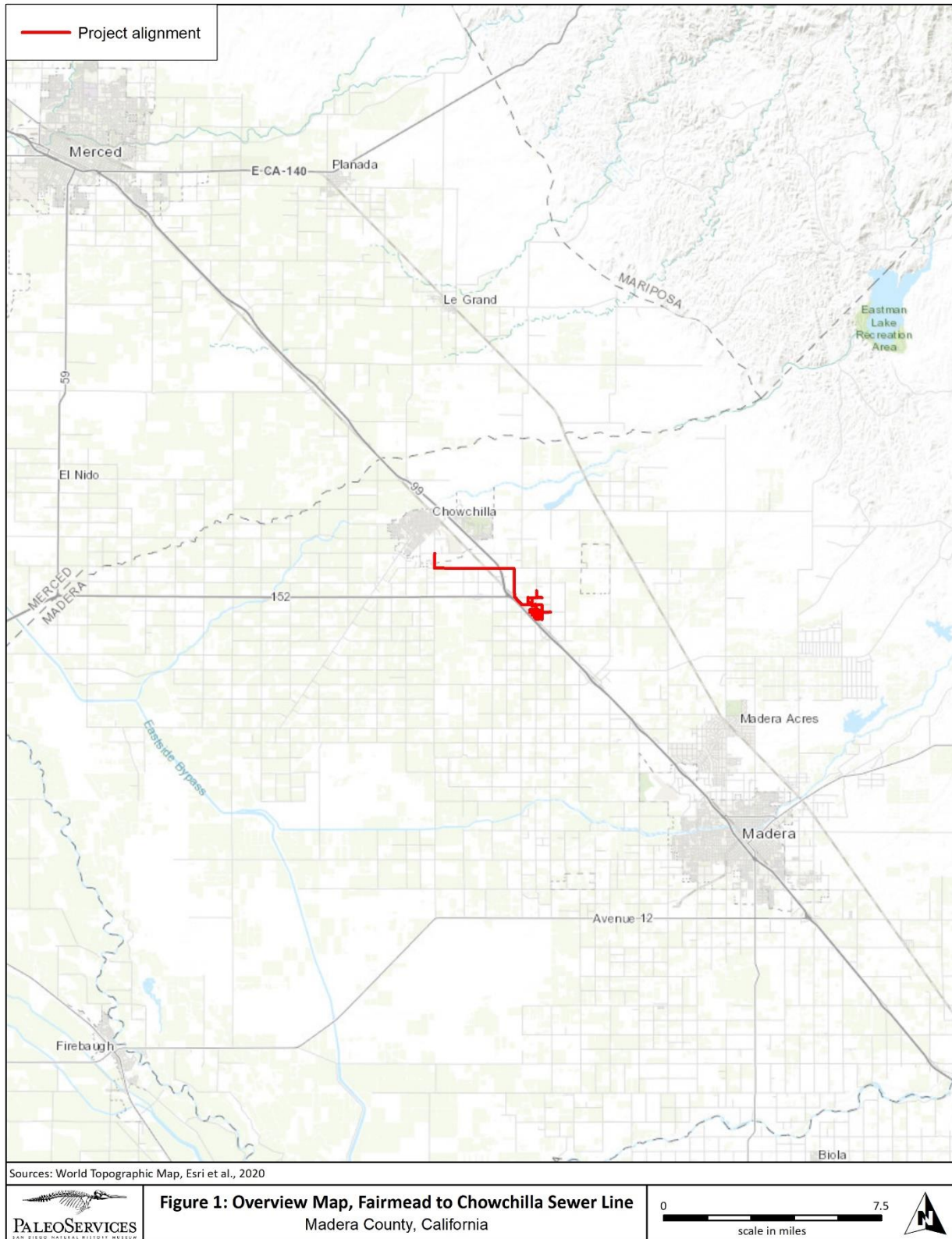
This technical report provides an assessment of paleontological resources for the proposed Fairmead to Chowchilla Sewer Line project (Project), which proposes to extend sewer collection services from the City of Chowchilla to the unincorporated community of Fairmead in western Madera County, California (Figure 1). The Project alignment extends from the community of Fairmead, located along the northeast side of State Route (SR) 99, west to Fairmead Boulevard, northwest to Road 18 ¾, north to Avenue 24, west to Road 16, and north to the City of Chowchilla's existing Wastewater Treatment Facility (WWTF), located at 15750 Avenue 24 ½. The Project proposes to construct approximately 5 miles of new sewer collection lines and a new sewer lift station in the community of Fairmead, a total of approximately 4.7 miles of new force sewer main and gravity sewer main to connect the new collection lines to the WWTF, and an additional 0.9 MGD package treatment plant and improvements at the WWTF in order to accommodate the additional wastewater flow from Fairmead.

Project components and construction methods, as currently proposed, are outlined below:

- The new sewer collection line network will be installed along local roadways in the community of Fairmead, with connections to approximately 175 residential properties, the Fairmead Elementary School, and a commercial property. The collection lines will drain to a centrally located sewer lift station in Fairmead.
  - The collection lines will consist of 4- to 10-inch-diameter sewer pipes with 4- or 5-foot-diameter manholes spaced at least every 500 feet. Installation will require the excavation of 1.5- to 3-foot-wide trenches to depths varying from 3 to 20 feet deep.
- The new sewer lift station will occupy a 1-acre footprint and will discharge wastewater to a new force sewer main leading from the community of Fairmead to the City of Chowchilla.
  - The lift station will measure 20 to 25 feet deep, and will include a standby generator, earthen emergency basin, odor control scrubber, and small electrical control building.
- The force sewer main will consist of one to two 4- to 8-inch-diameter pipes extending approximately 2.5 miles from the lift station to Avenue 24 on the west side of SR 99. The City of Chowchilla's existing 18-inch-diameter gravity sewer main will be extended approximately 2.2 miles from the WWTF to Avenue 24 on the west side of SR 99 to connect to the new force sewer main.
  - Installation of the new force sewer main and gravity sewer main will require the excavation of 3- to 5-foot-wide open cut trenches to depths varying from 3 to 20 feet deep, with some exceptions: the SR 99 and Union Pacific Railroad crossings along Avenue 24 (which will be installed by jack and bore) and the Road 16 bridge over Berenda Slough (which will either be installed beneath the Berenda Slough by jack and bore, or may be installed along the underside of the Road 16 bridge). In addition, there are three canal crossings that may require jack and bore installation if water is present.
- The connection between the existing and new gravity sewer main at the intersection of Avenue 24 ½ and Road 16 (northeast corner of the WWTF) will be replaced with 24-inch-diameter pipe and two manholes will be installed.



- A new 0.9 MGD package treatment plant will be constructed and an additional bar screen will be installed at the WWTF.



## 1.2 Scope of Work

The proposed Project alignment is located in an area underlain by native sedimentary deposits that are undisturbed at depth. For this reason, an assessment of paleontological resources was undertaken to determine whether construction of the Project has the potential to negatively impact paleontological resources. This report is intended to summarize existing paleontological resource data in the vicinity of the Project alignment, discuss the significance of these resources, examine potential Project-related impacts to paleontological resources, and suggest mitigation measures to reduce potential impacts to paleontological resources to less than significant levels. This report was written by Katie M. McComas and Thomas A. Deméré of the Department of PaleoServices, SDNHM.

## 1.3 Definition of Paleontological Resources

As defined here, paleontological resources (i.e., fossils) are the buried remains and/or traces of prehistoric organisms (i.e., animals, plants, and microbes). Body fossils such as bones, teeth, shells, leaves, and wood, as well as trace fossils such as tracks, trails, burrows, and footprints, are found in the geologic units/formations within which they were originally buried. The primary factor determining whether an object is a fossil or not is not how the organic remain or trace is preserved (e.g., “petrified”), but rather the age of the organic remain or trace. Although typically it is assumed that fossils must be older than ~11,700 years (i.e., the generally accepted end of the last glacial period of the Pleistocene Epoch), organic remains older than recorded human history and/or older than middle Holocene (about 5,000 radiocarbon years) can also be considered to represent fossils (SVP, 2010).

Fossils are considered important scientific and educational resources because they serve as direct and indirect evidence of prehistoric life and are used to understand the history of life on Earth, the nature of past environments and climates, the membership and structure of ancient ecosystems, and the pattern and process of organic evolution and extinction. In addition, fossils are considered to be non-renewable resources because typically the organisms they represent no longer exist. Thus, once destroyed, a particular fossil can never be replaced.

Finally, paleontological resources can be thought of as including not only the actual fossil remains and traces, but also the fossil collecting localities and the geologic units containing those localities. The locality includes both the geographic and stratigraphic context of fossils—the place on the earth and stratum (deposited during a particular time in earth’s history) from which the fossils were collected. Localities themselves may persist for decades, in the case of a fossil-bearing outcrop that is protected from natural or human impacts, or may be temporarily exposed and ultimately destroyed, as is the case for fossil-bearing strata uncovered by erosion or construction. Localities are documented with a set of coordinates and a measured stratigraphic section tied to elevation detailing the lithology of the fossil-bearing stratum as well as overlying and underlying strata. This information provides essential context for any future scientific study of the recovered fossils.

### 1.3.1 Definition of Significant Paleontological Resources

The California Environmental Quality Act (CEQA, Public Resources Code Section 21000 et seq.) dictates that a paleontological resource is considered significant if it “has yielded, or may be likely to yield, information important in prehistory or history” (Section 15064.5, [a][3][D]). The Society of Vertebrate Paleontology (SVP) has further defined significant paleontological resources as consisting of “fossils and fossiliferous deposits[...]consisting of identifiable vertebrate fossils, large or small, uncommon invertebrate, plant, and trace fossils, and other data that provide taphonomic, taxonomic, phylogenetic, paleoecologic, stratigraphic, and/or biochronologic information” (SVP, 2010).

## 1.4 Regulatory Framework

Paleontological resources are considered scientifically and educationally significant nonrenewable resources; they are protected under a variety of laws, regulations, and ordinances. The Project alignment is located within the City of Chowchilla and unincorporated areas of Madera County, California. As such, state and local regulations are applicable to the Project.

### 1.4.1 State: California Environmental Quality Act

The California Environmental Quality Act (CEQA, Public Resources Code Section 21000 *et seq.*) addresses paleontological resources in the context of an environmental review for a discretionary state or local agency action. Guidelines for the Implementation of CEQA are included in the California Code of Regulations (CCR), sections 15000 *et seq.* Within the CCR, paleontological resources are specifically addressed in the Environmental Checklist (CCR Section 15023, Appendix G): “Will the proposed project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.”

CEQA does not provide a definition for a “unique paleontological resource” in the Environmental Checklist (CCR Section 15023, Appendix G), nor does it include specific guidelines for the mitigation of paleontological resources under Section 15126.4, Consideration and Discussion of Mitigation Measures Proposed to Minimize Significant Effects. Therefore, most CEQA lead agencies follow the definitions and guidelines provided by SVP (2010), which are in line with industry standards (e.g., Murphey *et al.*, 2014; and see Section 1.3.1). The SVP (2010) additionally provides criteria for determining the significance of paleontological resources (see sections 1.3.1 and 2.2), and for appropriate measures to minimize impacts to paleontological resources. As advised by SVP (2010), impacts to paleontological resources can be minimized to a level below the threshold of significance through: 1.) the permanent preservation of a fossil locality and its contained fossil resources or 2.) the implementation of a paleontological mitigation program that would reduce any adverse impacts to a level below the threshold of significance through the salvage and permanent storage of any salvaged fossils in an established scientific institution.

### 1.4.2 Local: Madera County, City of Chowchilla

Madera County primarily addresses management of paleontological resources through CEQA. In addition, the Madera County General Plan includes Goal 4.D and related policies that are applicable to paleontological resources:

**Goal 4.D:** To identify, protect, and enhance Madera County’s important historical, archaeological, paleontological, and cultural sites and their contributing environment.

- **Policy 4.D.3:** The County shall require that discretionary development projects identify and protect from damage, destruction, and abuse, important historical, archaeological, paleontological, and cultural sites and their contributing environment.
- **Policy 4.D.4:** The County shall, within its power, maintain confidentiality regarding the locations of archaeological sites in order to preserve and protect these resources from vandalism and the unauthorized removal of artifacts. If significant archaeological and cultural resources are open to the public, the County shall control public access to prevent damage or vandalism.

The City of Chowchilla 2040 General Plan does not discuss or specify any requirements for paleontological resources. Paleontological resources, however, have often been considered a sub-category of cultural resources. The Open Space and Conservation Element of the General Plan contains requirements for cultural resources that involve the identification and documentation of significant

archaeological, cultural, and historical resources and the mitigation of impacts to significant cultural resources.

## 2.0 Methods

### 2.1 Paleontological Records Search and Literature Review

A paleontological records search of the paleontological collections at the SDNHM was conducted in order to identify any known fossil collection localities in the vicinity of the proposed Project components. An informal search of the online paleontological collections database at the University of California Museum of Paleontology (UCMP) was also conducted. In addition, a literature review was conducted to gain a greater understanding of the geologic history of the area surrounding the Project alignment, as well as to determine the types of fossils that specific geologic units underlying the Project alignment have produced. The literature review included examination of relevant published geologic maps and reports, peer-reviewed papers, and other relevant literature (e.g., field trip guidebooks, unpublished theses and dissertations, archived paleontological mitigation reports). This approach was followed in recognition of the direct relationship between paleontological resources and the geologic units within which they are entombed. Knowing the geologic history of a particular area and the fossil productivity of geologic units that occur in that area, it is possible to predict where fossils may or may not be encountered.

### 2.2 Paleontological Resource Assessment Criteria

The Society of Vertebrate Paleontology (SVP, 2010) has developed mitigation guidelines for paleontological resources that conform with industry standards (Murphey et al., 2019) and were developed with input from a variety of federal and state land management agencies. As described in Section 1.4.1, use of the SVP (2010) guidelines is common practice by CEQA lead agencies.

The SVP (2010) guidelines recognize that significant paleontological resources are considered to include not only actual fossil remains and traces, but also the fossil collecting localities and the geologic units containing those fossils and localities, and thus evaluate paleontological potential (or paleontological sensitivity) of individual geologic units within a project area. Paleontological potential is determined based on the existence of known fossil localities within a given geologic unit, and/or the potential for future fossil discoveries, given the age and depositional environment of a particular geologic unit. The SVP guidelines include four classes of paleontological potential: High Potential, Undetermined Potential, Low Potential, or No Potential (SVP, 2010). A summary of the criteria for each paleontological potential ranking is outlined below.

#### 2.2.1 High Potential

Geologic units from which vertebrate or significant invertebrate, plant, or trace fossils have been recovered are considered to have a high potential for containing additional significant paleontological resources. Geologic units classified as having high potential include, but are not limited to, some volcanoclastic formations (e. g., ashes or tephtras), some low-grade metamorphic rocks which contain significant paleontological resources anywhere within their geographical extent, and geologic units temporally or lithologically suitable for the preservation of fossils (e. g., deposits aged middle Holocene and older consisting of fine-grained fluvial sandstones, argillaceous and carbonate-rich paleosols, cross-bedded point bar sandstones, fine-grained marine sandstones, etc.). Paleontological potential includes both the potential for yielding abundant or significant vertebrate fossils or for yielding significant



invertebrate, plant, or trace fossils, as well as the importance of recovered evidence for new and significant taxonomic, phylogenetic, paleoecologic, taphonomic, biochronologic, or stratigraphic data. Geologic units which contain potentially datable organic remains older than late Holocene, including deposits associated with animal nests or middens, and geologic units which may contain new vertebrate deposits, traces, or trackways are also classified as having high potential.

### 2.2.2 Undetermined Potential

The definition for undetermined potential provided by SVP (2010) has been expanded for the purposes of this report in order to add more information related specifically to the management of paleontological resources in the context of mitigation paleontology. Geologic units are assigned an undetermined potential if there is little information available concerning their paleontological content, geologic age, and depositional environment. Further field study of the specific formation is necessary to determine if these geologic units have high or low potential to contain significant paleontological resources. For planning purposes, this class of resource potential represents a conservative assessment that assumes an undetermined geologic unit is fossiliferous until proven otherwise.

In the context of mitigation paleontology, gaining additional information about a geologic unit assigned an undetermined potential in order to refine the resource potential ranking (e.g., to high potential or low potential) can be accomplished in several ways depending on the nature of the geologic unit and whether it is exposed at the surface. Field surveys (e.g., a pre-construction survey as part of a paleontological resource assessment) can be conducted when a geologic unit is well exposed at the ground surface, allowing paleontologists to physically search for fossils while also studying the stratigraphy of the unit. In cases where the geologic unit is not exposed at the surface (e.g., is covered by disturbed areas such as concrete or agricultural topsoil, or occurs in the subsurface underlying another geologic unit), strategically located excavations into subsurface stratigraphy may be conducted to gain additional information (e.g., geotechnical investigation boreholes or trenches). Paleontological monitoring of excavations into a geologic unit with an undetermined potential as part of a paleontological monitoring program may also allow for refinement of the resource potential ranking of the unit over the course of the monitoring program. In this case, the results of the monitoring program are used to routinely reevaluate the resource potential ranking of the geologic unit.

### 2.2.3 Low Potential

Reports in the paleontological literature or field surveys by a qualified professional paleontologist may allow determination that some geologic units have low potential for yielding significant fossils. Such geologic units will be poorly represented by fossil specimens in institutional collections, or, based on general scientific consensus, only preserve fossils in rare circumstances where the presence of fossils is an exception not the rule, e. g. basalt flows or Recent colluvium. Geologic units with low potential typically will not require impact mitigation measures to protect fossils.

### 2.2.4 No Potential

Geologic units with no potential are either entirely igneous in origin and therefore do not contain fossil remains, or are moderately to highly metamorphosed and thus any contained fossil remains have been destroyed. Artificial fill materials also have no potential, because the stratigraphic and geologic context of any contained organic remains (i.e., fossils) has been lost. For projects encountering only these types of geologic units, paleontological resources can generally be eliminated as a concern, and no further action taken.

## 2.3 Paleontological Impact Analysis

Direct impacts to paleontological resources occur when earthwork operations cut into the geologic units within which fossils are buried and physically destroy the fossil remains. As such, only those excavations that will disturb potentially fossiliferous geologic units have the potential to significantly impact paleontological resources. As described above, potentially fossiliferous geologic units are those rated with a high potential. Taking a conservative approach, geologic units with an undetermined potential are also considered to be potentially fossiliferous until proven otherwise. Although impact avoidance is possible through relocation of a proposed action, paleontological monitoring during construction is typically recommended to reduce any negative impacts to paleontological resources to less than significant levels.

The purpose of the impact analysis is to determine which (if any) of the proposed Project-related earthwork activities may disturb potentially fossiliferous geologic units, and where and at what depths these impacts are likely to occur. The paleontological impact analysis involved analysis of available Project documents and comparison with geological and paleontological data gathered during the records search and literature review.

## 3.0 Results

### 3.1 Results of the Paleontological Records Search and Literature Review

The Project alignment is adjacent to the western foothills of the central Sierra Nevada, where Cenozoic sedimentary strata of the San Joaquin Valley are lapped on to the plutonic igneous rocks of the Sierra Nevada Batholith. The Project alignment is underlain by Pleistocene alluvial deposits associated with the Quaternary Chowchilla River alluvial fan. Included in this sequence are, from youngest to oldest: the Modesto Formation and Riverbank Formation, which are mapped at the surface along the Project alignment, and the Turlock Lake Formation, which is likely present in the relatively shallow subsurface along the Project alignment (Dundas and Chatters, 2013; Marchand and Allwardt, 1981; Wagner et al., 1991; Figure 2).

#### 3.1.1 Modesto Formation

**General Information:** The Modesto Formation was named for late Pleistocene- to early Holocene-age (approximately 75,000 to 9,000 years old) fluvial and alluvial fan sediments exposed on the south bluff of the Tuolumne River south of the City of Modesto. Marchand and Allwardt (1981) suggested that these sediments were deposited as a continuous series of coalescing alluvial fans along the eastern flanks of the Sierra Nevada between the Kern River in the south and the Sacramento River in the north. In the vicinity of the Project alignment, the upper alluvial fans and terraces of the Modesto Formation are exposed, and generally consist of arkosic alluvium (gravel, sand, and silt) derived from the Sierra Nevada and deposited by the action of major westward-flowing rivers (e.g., the Chowchilla River). The formation is generally distinguished from lithologically similar deposits of the Riverbank and Turlock Lake Formations based on its lower topographic position, and its lesser degree of dissection and soil development (Marchand and Allwardt, 1981).

**Paleontology:** The Modesto Formation has produced significant vertebrate fossils (e.g., large-bodied land mammals) from a selection of sites in San Joaquin, Fresno, Merced, Stanislaus, Yolo, and Sutter counties (Dundas et al., 2009; Jefferson, 2010; UCMP online database). Certainly the most significant



discoveries to date have been those associated with paleontological mitigation work related to construction of the Arboleda Drive overcrossing project (located approximately 11 miles northwest of the Project area) along SR 99 to the southeast of Merced. Over 1,600 vertebrate fossils were collected from 39 localities discovered at varying depths of 2 to 27 feet below original ground surface. Recovered fossils include skeletal elements of bony fishes, frogs, lizards, snakes, birds, and mammals. The latter group includes specimens of mice, gopher, pack rat, kangaroo rat, ground squirrel, rabbits, puma, coyote, dire wolf, mule deer, horses, ancient bison, American llama, western camel, giant ground sloth, and Columbian mammoth (Gust et al., 2012). Additional fossils recovered from undifferentiated deposits of the Modesto and Riverbank formations in the vicinity of the Project alignment include: a fossil specimen of a proboscidean recovered from the south side of Ash Slough (northeast of Chowchilla), and a mammoth (*Mammuthus* sp.; Chowchilla, precise location unknown) (Jefferson, 2010).

### 3.1.2 Riverbank Formation

**General Information:** The middle to late Pleistocene-age (approximately 450,000 to 97,000 years old) Riverbank Formation consists of paleosols (ancient soil horizons) and alluvial-fan and stream-laid gravel, sand, silt, and clay sediments derived from the Sierra Nevada to the east (Marchand and Allwardt, 1981). While lithologically very similar to the Modesto Formation, the Riverbank Formation can be distinguished by its elevated position relative to the Modesto Formation and by its greater degree of soil development (Marchand and Allwardt, 1981). In the vicinity of the Project site, the Riverbank Formation is underlain by the Turlock Lake Formation.

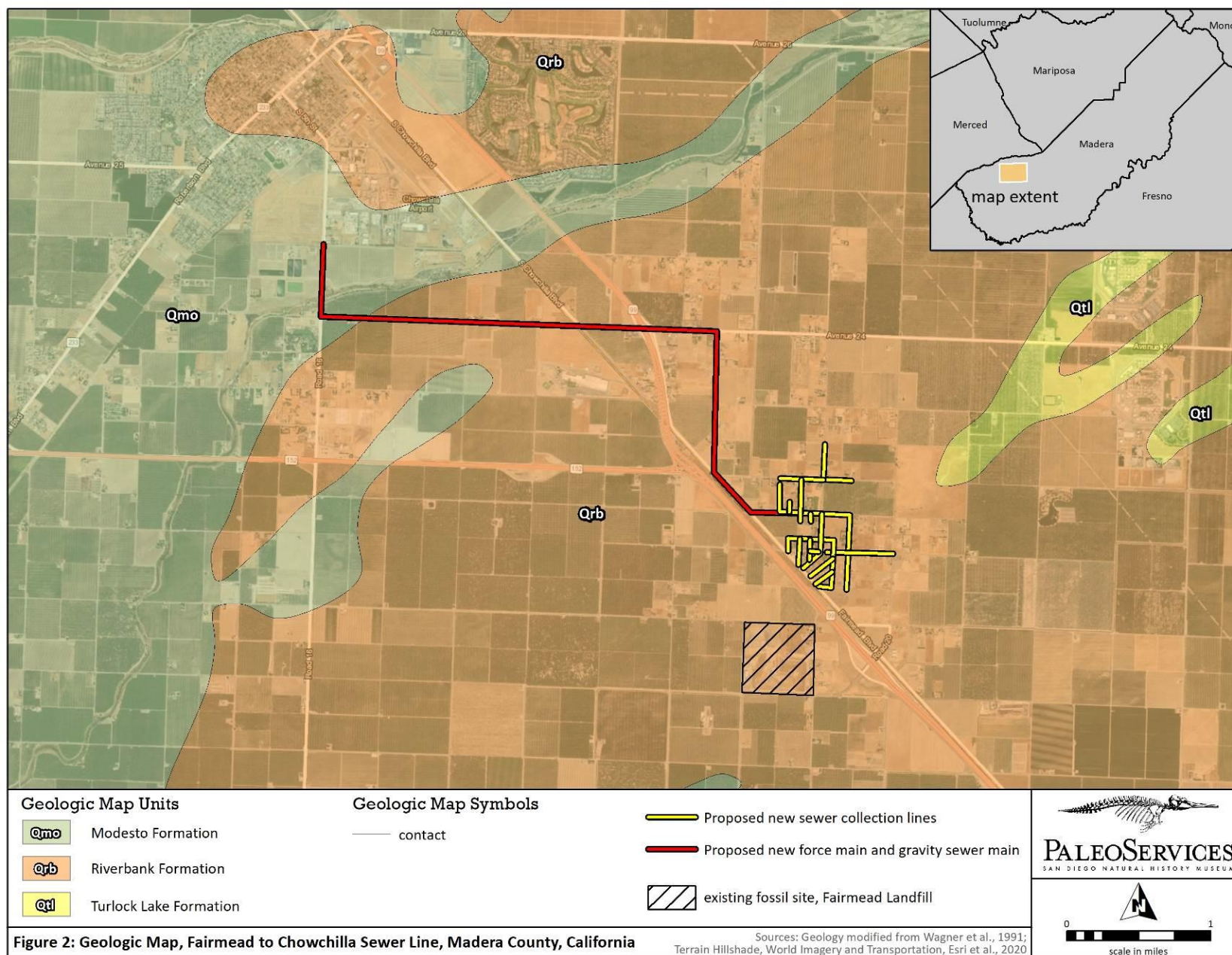
**Paleontology:** Fossils of terrestrial vertebrates, fish, and plants have been recovered from the Riverbank Formation where exposed in Sacramento County and the northern portion of the San Joaquin Valley. The majority of fossils were recovered from just a few sites: during construction of the ARCO sports arena in Sacramento, and from the Teichert and Davis gravel pits in Sacramento. These collection localities yielded remains of cyprinid fish, frog, colubrid snake, western pond turtle, duck, mole, coyote, dire wolf, squirrel, pocket gopher, pocket mouse, harvest mouse, pack rat, meadow vole, cottontail rabbit, deer, bison, camel, horse, mammoth, and Harlan's ground sloth, as well as an unidentified leaf impression and seed of a holly-leaved cherry (Hansen and Begg, 1970; Hilton, et al., 2000; Jefferson, 2010). The presence of *Bison* indicates a Rancholabrean age for this assemblage (approximately 240,000 to 11,700 years old). Additional documented vertebrate fossil localities are located in Stanislaus and Merced counties (Jefferson, 2010). In the near vicinity of the Project alignment are two additional fossil localities from undifferentiated deposits of the Modesto and Riverbank formation, which yielded proboscidean and mammoth fossils (see Section 3.1.1 for details; Jefferson, 2010).

### 3.1.3 Turlock Lake Formation

**General Information:** The early to middle Pleistocene-age (approximately 1 million to 540,000 years old) Turlock Lake Formation primarily consists of fine-grained sands and silt, with occasional horizons of clay and coarse-grained pebbly sand and gravel, representing marsh/lacustrine, distal fan overbank flood, and distal alluvial fan depositional environments (Dundas and Chatters, 2013; Marchand and Allwardt, 1981). A distinctive paleosol horizon separates the lower and upper units. While not exposed at the surface along the Project alignment, the Turlock Lake Formation underlies the Riverbank Formation in the Project vicinity at depths as little as 13 feet below ground surface (McDonald et al., 2013).

**Paleontology:** In the vicinity of the Project site, the upper unit of the Turlock Lake Formation is particularly rich with fossils, and has produced an exceptionally well-preserved and diverse mid-Irvingtonian-aged (about 780,000 to 550,000 years old) fauna at the Fairmead Landfill, located less than one half-mile south of the southeastern portion of the Project alignment. Recovered fossils from the landfill include freshwater fish, amphibians (e.g., salamanders, newts, frogs), reptiles (e.g., turtles,

tortoises, snakes), birds (ducks, geese, swans, owls, dove), and a diversity of small mammals (e.g., shrews, rodents, rabbits, hares), large-bodied herbivores (e.g., ground sloths, mammoth, horse, camel, llama, deer, pronghorn, peccary), and carnivores (dire wolf, coyote, swift fox, Scimitar cat, saber-toothed cat, American cheetah, American lion, bobcat, giant short-faced bear, and badger) (Dundas et al., 1996; Dundas and Chatters, 2013; McDonald et al., 2013).



## 3.2 Results of the Paleontological Resource Potential Analysis

Following the SVP (2010) impact mitigation guidelines, as outlined in Section 2.2, the Modesto Formation, Riverbank Formation, and Turlock Lake Formation underlying the Project alignment are each assigned a high paleontological potential, based on the recovery of diverse assemblages of terrestrial vertebrates from all three of these geologic units, including from documented fossil localities in the Chowchilla–Fairmead area.

## 3.3 Results of the Paleontological Impact Analysis

As discussed above, the Project alignment is immediately underlain by potentially fossil-bearing sedimentary deposits of the Modesto Formation, Riverbank Formation, and Turlock Lake Formation. Impacts to paleontological resources may occur during excavations within previously undisturbed deposits of these geologic units.

The new sewer collection lines and the majority of the new force sewer main and gravity sewer main will be installed using open trench construction methods. Trenches will typically measure 1.5 to 3 feet wide (collection lines) or 3 to 5 feet wide (sewer main) and range from 3 to 20 feet deep, with additional excavation required for manholes. Excavation for the lift station, which will extend to depths of 20 to 25 feet below ground surface, will also likely involve open cut methods. This type of earthwork typically brings up spoils of intact blocks of sedimentary rocks that may contain unbroken fossil remains, and thus monitoring of such activities can lead to the discovery and salvage of significant fossils. Any other miscellaneous earthwork related to construction of the wastewater treatment plant (e.g., grading, subgrade trenching, large-diameter augering) can also typically be successfully monitored for paleontological resources.

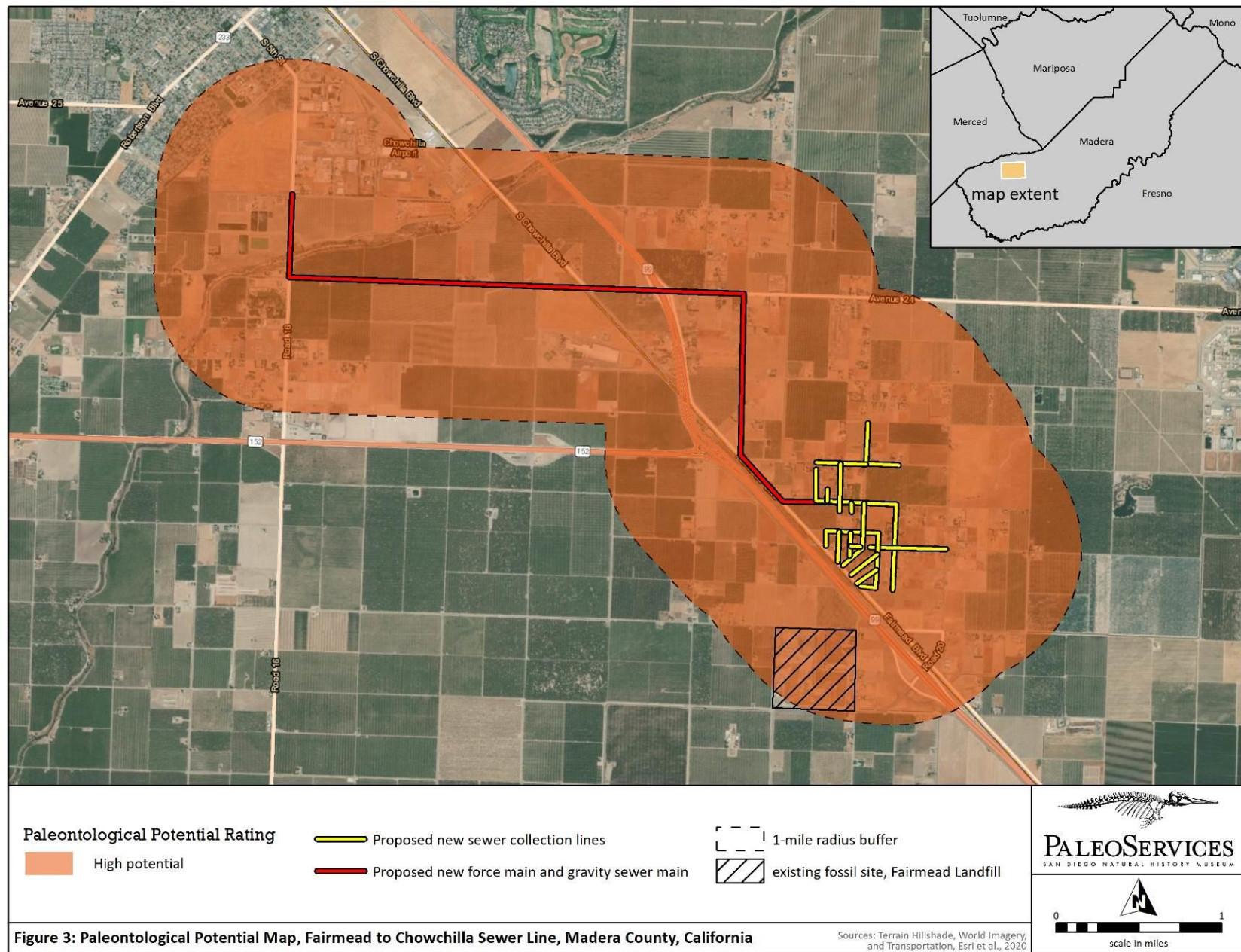
Excluded from paleontological monitoring is the horizontal drilling of boreholes related to jack and bore installation methods and any aboveground installation. Segments of the new sewer main along Avenue 24 (the SR 99 and Union Pacific Railroad crossings) will be installed by jack and bore. Canal crossings may also require jack and bore installation if water is present. Finally, a segment of the new sewer main along Road 16 (the Berenda Slough crossing) will be installed either by jack and bore, or by attachment to the underside of the existing bridge, which would not require excavation. Jack and bore horizontal drilling typically produces spoils of pulverized sedimentary rock, and thus destroys most, if not all, macrofossil remains that may have been present. In addition, the precise stratigraphic context of any encountered fossils is impossible to document with this construction method, eliminating their research value. However, excavation of the sending and receiving pits at either end of the jack and bore segments of the new sewer main will involve significant earthwork that can be successfully monitored for paleontological resources.

**Table 1.** Summary of paleontological potential of geologic units underlying the Project alignment and paleontological monitoring recommendations for earthwork impacting each geologic unit.

Geologic unit (map symbol)	Age (years old)	Paleontological potential	Monitoring recommended?*
Modesto Formation (Qmo)	late Pleistocene to early Holocene (75,000 to 9,000)	High	Yes
Riverbank Formation (Qrb)	middle to late Pleistocene (450,000 to 97,000)	High	Yes
Turlock Lake Formation (Qtl) (present in subsurface)	early Pleistocene (1 million to 570,000)	High	Yes

\*excluding horizontal drilling for jack and bore installation and aboveground installation





## 4.0 Recommendations & Conclusions

Implementation of a paleontological mitigation program, in the form of paleontological monitoring, is recommended for all excavations along the Project alignment that will directly impact the Modesto Formation, Riverbank Formation, and Turlock Lake Formation, with the exception of horizontal drilling for jack and bore installation. Implementation of the following mitigation measures will reduce any Project-related impacts to paleontological resources to a level that is less than significant.

### 4.1 Mitigation Measures

1. Prior to the start of earthwork, a qualified Project Paleontologist should be retained to oversee the paleontological mitigation program, and should attend the pre-construction meeting to consult with Project contractors concerning excavation schedules, paleontological field techniques, and safety issues.

*A qualified Project Paleontologist is defined as an individual with an M.S. or Ph.D. in paleontology or geology that is experienced with paleontological procedures and techniques, who is knowledgeable in the geology and paleontology of Madera County, and who has worked as a paleontological mitigation project supervisor for at least one year.*

2. A paleontological monitor should be on-site during all excavations along the Project alignment that will directly impact the Modesto Formation, Riverbank Formation, and Turlock Lake Formation, with the exception of horizontal drilling for jack and bore installation. The paleontological monitor should be equipped to salvage fossils as they are unearthed (including bulk matrix samples containing microvertebrate fossils) to avoid construction delays. Paleontological monitoring may be reduced (e.g., part-time monitoring or spot-checking) or eliminated, at the discretion of the Project Paleontologist and in consultation with appropriate agencies (e.g., Project proponent, City of Chowchilla representatives). Changes to the paleontological monitoring schedule shall be based on the results of the mitigation program as it unfolds during site development, and current and anticipated conditions in the field.

*A paleontological monitor is defined as an individual with a college degree in paleontology or geology who has experience in the recognition and salvage of fossil materials. The paleontological monitor should work under the direction of the Project Paleontologist.*

3. If fossils are discovered, the Project Paleontologist (or paleontological monitor) should make an initial evaluation to determine their significance. All identifiable vertebrate fossils (large or small) and uncommon invertebrate, plant, and trace fossils are considered to be significant and should be recovered (SVP, 2010). Representative samples of common invertebrate, plant, and trace fossils should also be recovered. Although fossil salvage can often be completed in a relatively short period of time, the Project Paleontologist (or paleontological monitor) should be allowed to temporarily direct, divert, or halt earthwork during the initial assessment phase. If it is determined that the fossil(s) should be recovered, all effort should be made to complete the recovery in a timely manner. It is important to keep in mind that some fossil specimens (e.g., a large mammal skeleton) may require an extended salvage period. Because of the potential for the recovery of small fossil remains (e.g., isolated teeth of small vertebrates), it may be necessary to collect bulk-matrix samples for screen washing or to set up an on-site screen washing station.



4. In the event that fossils are discovered during a period when a paleontological monitor is not on site (i.e., an inadvertent discovery), earthwork within the vicinity of the discovery site shall temporarily halt, and the Project Paleontologist contacted to evaluate the significance of the discovery. If the inadvertent discovery is determined to be significant, the fossils shall be recovered, as outlined in Mitigation Measure 3.
5. Fossil remains collected during monitoring and salvage should be cleaned, repaired, sorted, taxonomically identified, and cataloged as part of the mitigation program. Fossil preparation may also include screen-washing of bulk matrix samples for microfossils or other laboratory analyses (e.g., radiometric carbon dating), if applicable. Fossil preparation and curation activities may be conducted at the laboratory of the contracted Project Paleontologist, at an appropriate outside agency, and/or at the designated repository, and shall follow the standards of the designated repository.
6. Prepared fossils, along with copies of all pertinent field notes, photos, and maps, should be housed in an established, accredited museum repository with permanent, retrievable paleontological storage (e.g., University of California Museum of Paleontology, San Diego Natural History Museum). These procedures are essential steps in effective paleontological mitigation and CEQA compliance. The Project Paleontologist must have a written repository agreement in hand prior to the initiation of mitigation activities. Mitigation of adverse impacts to significant paleontologic resources is not complete until such curation into an established, accredited museum repository has been fully completed and documented.
7. A final summary report should be completed that outlines the results of the mitigation program. The report and inventory, when submitted to the appropriate Lead Agency, along with confirmation of the curation of recovered specimens into an established, accredited museum repository, will signify completion of the program to minimize impacts to paleontological resources. A copy of the paleontological monitoring report should be submitted to the lead agency and to the designated museum repository.

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**APPENDIX G**  
**TRAFFIC MEMORANDUM**

April 10, 2020

Des Johnston, AICP  
QK  
2816 Park Avenue  
Merced, CA 95348

**Re: Trip Generation Memorandum for the Fairmead Wastewater System Improvements Project**

Dear Mr. Johnston:

VRPA Technologies, Inc. (VRPA) prepared the following Trip Generation Memorandum, which includes trip generation for the proposed Fairmead Wastewater System Improvements Project. Fairmead is a small, rural community located southeast of the State Route (SR) 99/SR 152 interchange in unincorporated Madera County. Located roughly in the center of the San Joaquin Valley, Fairmead lies between the cities of Chowchilla to the north and Madera to the south. The Community includes a small core of compact streets and blocks located east of SR 99 and the Union Pacific (formerly Southern Pacific) railroad along Fairmead Boulevard.

The City of Chowchilla's Wastewater Treatment Facility, 15750 Avenue 24 ½ in Chowchilla, CA, is located at the northern most end of the proposed Project.

## **PROJECT BACKGROUND**

Properties within Fairmead rely on individual septic systems for sewer service. Wastewater in the Community is disposed of through the use of onsite septic tanks and leach fields or pits. There is no sanitary sewer collection system or wastewater treatment facility in the Community, or immediately adjacent to it. Potential for contamination of groundwater supplies has caused the State and County to request that the City of Chowchilla consider connecting Fairmead to the City's existing wastewater treatment plant. This would require construction of a sewer collection system and transmission line from Fairmead to Chowchilla.

The Project would abandon the septic tanks and leach fields in Fairmead and direct wastewater flows through a new sewer trunk line to the City of Chowchilla's Wastewater Treatment Facility (WWTF) (Project). Approximately 175 residential connections, the Fairmead Elementary School, and a commercial property will be connected to the City of Chowchilla's WWTF. The Project includes a collection system, pump station, force main and gravity main with wastewater treatment and disposal at the existing City of Chowchilla WWTF. The Project will include the following components:

- ✓ Fairmead Gravity Collection System and Lift Station
  - Abandoning of the existing septic tanks and leach fields in Fairmead and direct wastewater flows into a new sewer collection system within Fairmead.
  - The new sewer collection system will drain to a centrally located pump lift station in 4-in to 10-in diameter sewer pipes, with 4-ft or 5-ft diameter manholes spaced at least every 500-ft. Gravity sewer trenches will be 1.5-ft to 3-ft wide and vary from 3-ft to 20-ft deep.

- The sewer lift station will be centrally located in Fairmead, 20-ft to 25-ft deep, with appurtenances to include a standby generator, an earthen emergency basin, an odor control scrubber, and a small building to house electrical panels, all on a one-acre site.
- ✓ Force Main and Gravity Sewer Line
  - The proposed lift station will discharge effluent to a force main that will consist of one to two 4-in to 8-in diameter pipes approximately 2.5 miles long from the Community of Fairmead to Avenue 24 on the west side of Highway 99, inside the City of Chowchilla. The City's existing 18-in gravity sewer main will be extended south along Road 16 and then east along Avenue 24 and will terminate on the west side of Highway 99 for a distance of 2.2 miles where it will connect to the new force main.
  - Both the force main and gravity main will be installed in the roadway and roadway shoulders. The total length of both the gravity line and the force main segment will be 4.7 miles.
- ✓ Wastewater Treatment Facility Improvements
  - A 0.9 MGD package treatment plant will be constructed to accommodate service to Fairmead.
  - An additional bar screen will be installed to lessen the burden on the existing structure and allow Public Works staff to take one offline for cleaning and maintenance, thus increasing solids removal earlier in the process and improving the quality of water passed to the next stage of treatment.

## TRIP GENERATION

To assess the impacts that a Project may have on the surrounding roadway network, the first step is to determine Project trip generation. Project trips are generally determined using trip generation rates from the Institute of Transportation Engineers (ITE) Trip Generation Manual (10th Edition). However, the 10th Edition does not include land uses that accurately reflect the proposed Project's operations. It should be noted that a traffic analysis for a proposed project typically evaluates the trips generated by the operation of the project. The proposed Fairmead Wastewater System Improvements Project will not generate a substantial amount trips during its operation but would generate some trips during the construction phase of the Project.

### ✓ Construction

Project trip generation associated with the construction phase was estimated as shown in Table 1. The trip generation is based on information provided in the Sacramento Metropolitan Air Quality Management District's Road Construction Emissions Model, (commonly called "SacMetro") Version 8.1.0. The model was used to estimate air quality impacts associated with the construction of the Project and calculates a linear-type project's emissions (such as a pipeline or roadway) by project phase over the entire construction period. The model includes estimates related to daily trips. Total AM and PM peak hour trips were estimated to reflect 40% of the daily trip information provided in the SacMetro model.

The construction phase would include workers such as laborers, craftsmen, supervisory personnel, support personnel, and construction management personnel. It is anticipated that construction workers would commute to the site each day from local communities. Table 1 reflects the maximum number of trips generated during construction of the Project.



**Table 1**  
**Project Trip Generation**

LAND USE	DAILY TRIP ENDS (ADT)	WEEKDAY AM PEAK HOUR				WEEKDAY PM PEAK HOUR			
		IN:OUT SPLIT	VOLUME			IN:OUT SPLIT	VOLUME		
			IN	OUT	TOTAL		IN	OUT	TOTAL
Fairmead Wastewater System Improvements Project	80	90:10	29	3	32	10:90	3	29	32
<b>TOTAL TRIP GENERATION</b>	<b>80</b>		<b>29</b>	<b>3</b>	<b>32</b>		<b>3</b>	<b>29</b>	<b>32</b>

✓ Operations and Maintenance

As noted above, the proposed Project will not generate a substantial amount trips during its operation given the characteristics of the Project. The Project will include a standby generator, an earthen emergency basin, an odor control scrubber, and a small building which will house electrical panel. The site will be unmanned and will require periodic maintenance, but overall, will not generate consistent daily/peak hour trips beyond the construction phase.

## CONCLUSIONS

Based on Table 1 above, development of the Project will not generate daily or peak hour trips that would significantly impact the surrounding roadway network or disrupt existing intersection/roadway operations. As a result, a detailed Traffic Impact Study (TIS) is not required at this time.

If you have any questions or require further information, please contact me at (559) 271-1200 extension 2.

Sincerely,



Mr. Jason Ellard  
Transportation Engineer

