INITIAL STUDY

FOR THE

BUTTONWILLOW COUNTY WATER DISTRICT WASTEWATER TREATMENT PLANT IMPROVEMENTS PROJECT

Prepared for:

Buttonwillow County Water District
289 North Main Street
Buttonwillow, California 93206

Prepared by:

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LIST OF ABBREVIATIONS AND ACROYNMS

AB	Assembly Bill
amsl	above mean sea level
APE	Area of Potential Effect
APN	Assessor Parcel Number
ARB	Air Resources Board
AQMD	Air Quality Management District
BACMs	best available control measures
BCWD	Buttonwillow County Water District
Bgs	below ground surface
BMPs	best management practices
BOD	Biochemical Oxygen Demand
BRA	Biological Resources Assessment
CARB	California Air Resources Board
CalEEMod	California Emissions Estimator Model
CDFW	California Department of Fish and Wildlife
CESA	California Endangered Species Act
CEQA	California Air Quality Act
CNEL	Community Noise Equivalent Level
dB	decibel
dBA	A-weighted decibel
DDW	Division of Drinking Water
EC	Electrical Conductivity
EO	Executive Orders
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FIRM	Federal Insurance Rate Map
FTA	Federal Transit Association
GHG	Greenhouse Gas
Leq	time average sound level
MBTA	Migratory Bird Treaty Act
MCLs	Maximum Contaminant Levels
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
PER	Preliminary Engineering Report System Evaluation
PG&E	Pacific Gas & Electric
RAS	return activated sludge
ROW	rights-of-way
RWQCB	Regional Water Quality Control Board
SCADA	supervisory control and data acquisition

SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SIP	State Implementation Plan
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SR	State Route
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TCR	Tribal Cultural Resources
TSS	Total Suspended Solids
VdB	velocity in decibels
VFDs	variable frequency drive
VMT	vehicle miles traveled
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WAS	waste activated sludge
WDR	Waste Discharge Requirements
WWTP	Wastewater Treatment Plant

ENVIRONMENTAL CHECKLIST FORM

INTRODUCTION

1. Project Title: Wastewater Treatment Plant (WWTP) Improvements Project

2. Lead Agency Name: Buttonwillow County Water District
   Address: 289 North Main Street
   Buttonwillow, CA 93206

3. Contact Person: Ms. Regina Houchin, Board Secretary
   Phone Number: (661) 764-5405
   E-Mail Address: rhouchin@agcenteraccounting.com

4. Project Location: The Buttonwillow County Water District (BCWD or District) located in the southern San Joaquin Valley, is about 25 miles west of downtown Bakersfield. Refer to Figure 1. The proposed project consists of replacement of a small, poorly performing wastewater treatment plant (WWTP) and installation of support facilities required to allow the District to meet waste discharge requirements with the treated effluent.

   The unincorporated community had a population of 1,337 residents in 2020, according to U.S. Census data. Figure 2 shows a map of the service area. The WWTP is located on District-owned land about 0.5 mile north of the Buttonwillow community (refer to Figure 2), in Section 13, Township 29 South, Range 23 East, MDB&M. The facilities will occupy a portion of 70 acres of District property. Historically, the District has grown feed and fodder crops on the western 40 acres using wastewater effluent for irrigation; in recent years, the effluent has been disposed of by percolation and evaporation from the existing ponds. The current WWTP site is bisected by electric transmission lines limiting use of much of the site for uses other than farming and/or ponds.

5. Project Sponsor's Name and Address: Buttonwillow County Water District
   289 North Main Street
   Buttonwillow, CA 93206

6. General Plan Designation: Not Applicable

7. Zoning Classification: Not Applicable

8. Project Description

Introduction

Most of the following information is abstracted from "*Buttonwillow County Water District Wastewater Treatment Plant Improvements Project Clean Water State Revolving Fund Project Report*" (Project Report), prepared by Provost & Pritchard Consulting Group, 2022. This document is provided in whole in Appendix 1 of this document and readers desiring additional

details about the project can review this document. The District is seeking assistance from the State Water Board to fund the implementation recommendations of the PER as summarized below.

Project Description

Existing Facilities

The existing WWTP site plan is shown on Figure 3 (Figure 3-1 of the Project Report). The existing Buttonwillow WWTP consists of two side by side pre-engineered modular biological treatment systems constructed in 2010. The modular units are constructed of painted steel and sit on a concrete slab and are entirely above grade. The primary components include an equalization tank, rotating biological contactor, Bio-wheel followed by a flat plate membrane filtration system designed to remove biochemical oxygen demand (BOD) and suspended solids. The system is also designed to nitrify/denitrify.

This system operates in the following manner. The raw effluent is pumped from the influent lift station structures, where it passes through a splitter to divide the flow between the two units, and a coarse basket screen before entering an aerated equalization tank. From the equalization tank, the wastewater is pumped with submersible pumps into a mixed anoxic denitrification tank. The denitrification tank wastewater is pumped into the Bio-wheel tank. The effluent from the Bio-wheel tank us pumped into the membrane tank. Solids from the Bio-wheel tank are pumped into a sludge tank. Mixed liquor activated sludge from the tank is either returned to the process (return activated sludge, RAS) or wasted (waste activated sludge, WAS) to the sludge drying bed.

Effluent from the membranes is distributed to one of two unlined recycled water ponds. These ponds provide for percolation of the effluent into the soil and sediments beneath the ponds and evaporation to the atmosphere. Effluent from the ponds may also be applied, if needed, to feed and fodder crops on the 40 acres adjacent to the WWTP, but the District has not used this disposal method in recent years. At the current flow of wastewater to the WWTP (0.091 MGD), effluent entering the ponds percolates and evaporates quickly, leaving little or no water available for irrigation.

Proposed Facilities

The primary focus in the Project Report (Appendix 1) is the evaluation and selection of a treatment alternative to prevent future discharges that are out of compliance with the 2009 Waste Discharge Requirements. According to the Report, the existing WWTP has been plagued with operational issues since it was commissioned in 2010. Due to operational issues, the WWTP has consistently been out of compliance with the WDR limits. Beginning on page 1-1 (Appendix 1) and on following pages, the operational issues at the WWTP are summarized. In short, the WWTP has not operated as originally designed and this has resulted in secondary treatment capacity not being used and discharge requirements, such as Total Suspended Solids (TSS), Electrical Conductivity (EC), and Total Nitrogen. The net effect of this situation is that the existing WWTP needs to be upgraded or an alternative treatment system needs to be installed.

After evaluating four alternatives in the Project Report, Alternative 2, the Biolac Extended Aeration System, was selected as the recommended alternative for treatment and disposal. The Biolac System can meet the nitrogen disposal requirements and eliminates the acquisition of additional crop land and access to supplemental irrigation water. This system does result in an increase in the operational complexity for treatment. The Biolac system mainly consists of a concrete-lined

aeration pond with two circular clarifiers, as shown on Figure 4 (Figure 5-2 of the Project Report) and Figure 5 (Biolac Preliminary Process Flow Diagram, Figure 6-1 of the Project Report). The influent lift station would be upgraded with new pumps, piping, valves, and the wet well will be repaired and lined. A new headworks would be constructed with an automatically cleaned screen. Other ancillary facilities would include RAS/WAS pump station, sludge digester and drying beds, electrical, a new Supervisory Control and Data Acquisition (SCADA) system, motor control center, emergency generator, operations building and paved access road. Other support facilities are summarized below.

Supporting Improvements

Influent Lift Station
The District has evaluated the existing influent lift station and determined that the pumps, piping and valves, flow meter, and electrical controls need to be replaced. The existing wet well will require some concrete repair and the inside will need to be coated to resist deterioration of the concrete caused by hydrogen sulfide. The pumps will be equipped with variable speed drives to equalize flow through the WWTP. The lift station controls will be integrated into the WWTP SCADA system.

Headworks Screening
A new automated, headworks screen will be constructed to aid in removal of non-biodegradable material. A new automatically cleaned screen and a bypass channel with a manual bar screen will be installed. Aerated pond systems can function with 1/2-inch coarse screens. For other treatment processes, fine screens would be needed to aid in the automatic removal of coagulated grease prior to treatment.

SCADA System
The existing WWTP does not have a SCADA system. A new SCADA system will be included with the WWTP upgrades to provide alarm capabilities as well as providing automatic data logging of critical information.

Solids Handling
Periodically sludge needs to be collected from the treatment process for the proposed project. Two or more sludge drying beds will be installed to allow one drying bed to be serviced and sludge dried while the second one is being filled.

Electrical Facilities
The existing electrical facilities are insufficient for the proposed WWTP improvements. The current supply voltage is 240 volts AC. A 480-volt, 3-phase electric service will be required for the proposed project. It is recommended that the electrical facilities be upgraded or replaced with the proposed project. A new emergency generator will be installed under this project. Where possible, electrically operated equipment will be located away from the existing high voltage power lines over the site and be sheltered from sun and weather. Controls and instrumentation plus any variable frequency drives (VFDs) will be enclosed in a climate-controlled structure. In addition, the District will implement a 2-acre solar array to help defray power costs of the new WWTP (refer to figure 4 for locations).

Supply Water
The WWTP does not currently have a potable water supply . Installation of a potable water service is recommended for the new WWTP to provide washdown and house-keeping water, drinking water, and a restroom. Providing service from the District's potable water system would require

installation of approximately one-half-mile of a 4-inch PVC pipeline from the community to the WWTP. This system will require a backflow preventer. A water connection will be necessary for rinsing the proposed automatically cleaned screen at the headworks. Hose bibs would be provided near the headworks and treatment facilities for wash down.

Buildings
A pre-engineered modular building (approximately 20' by 50") equipped with a power, internet connection and an HVAC system will be provided. The building will include office space, laboratory counter space, sink for sampling activities, and an ADA accessible restroom. The building may also house the motor control center and electrical gear. The proposed project's aeration blowers will be installed in an open-sided shelter with a concrete slab providing some protection against rain and sun.

Access Road and Fences
The access road to the WWTP off Sullivan Road is currently an unmaintained dirt road. During the winter this road is undrivable. At a minimum, a single-lane 16-foot wide paved access road with aggregate base, will be included to provide year-round vehicle access and proper road drainage. The length of the road is approximately 1,800 feet. The WWTP area, including the treatment ponds, percolation ponds, emergency storage ponds, stormwater ponds, and solar panel area will be enclosed with chain-link fences.

After extensive discussion with the project CEQA team and engineers, an Area of Potential Effect (APE) was identified as shown on Figure 6. The large area shown for the solar facility was selected to allow a 2.5-acre site to be identified with minimal biology and cultural resources. Based on the field surveys, a final location has been chosen that has the least potential adverse impact on these two resources.

Construction Scenario

All of the proposed work locations occur on relatively flat land, in most cases highly disturbed locations (current WWTP site, graded dirt roads, and farmed agricultural land). The following construction information was compiled by the engineering team (Table 1) to estimate air pollutant and Greenhous Gas (GHG) emissions for the whole of the project, including the broad construction activities.

Table 1
ESTIMATED CONSTRUCTION ACTIVITIES

Construction Start Date:	TBD	
Approximate Construction Duration:	18	Months

						SOIL EXPORT			SOIL IMPORT		
CONSTRUCTION PHASE/ACTIVITY		EQUIPMENT TYPE	# PIECES OF EQUIPMENT	HOURS/DAY	NUMBER OF DAYS	TOTAL TO BE EXPORTED (CYDS)	# OF DAILY HAUL TRUCKS	DISTANCE OF HAUL (MILES/ ROUND TRIP)	TOTAL TO IMPORTED (CYDS) *	# OF HAUL TRUCKS	DISTANCE OF HAUL (MILES/ ROUND TRIP)
Quantities	**Excavation/Earthwork**										
	Influent Pump Station	None									
300 CY	Headworks	Excavator, Loader, Water Truck	3	8	2	0	0	0	30	1	60 Miles RT
2,900 CY	Biolac Pond	Scraper, Blade, Water Truck	3	8	8	0	0	0	290	12	60 Miles RT
500 CY	Clarifiers	Excavator, Loader, Water Truck	3	8	3	0	0	0	50	1	60 Miles RT
200 CY	RAS/WAS Pump Station	Excavator, Loader, Water Truck	3	8	2	0	0	0	20	1	60 Miles RT
300 CY	Sludge Digester	Excavator, Loader, Water Truck	3	8	2	0	0	0	30	1	60 Miles RT
700 CY	Sludge Drying Beds	Excavator, Loader, Water Truck	3	8	4	0	0	0	70	1	60 Miles RT
600 CY	Yard piping	Backhoe, Loader, Water Truck	3	4	20	0	0	0	60	1	60 Miles RT
100 CY	Misc site work	Backhoe, Loader, Water Truck	3	4	4	0	0	0	25	1	60 Miles RT

*** Assumed 10% of quantities**

Quantaties	**Concrete Work**	EQUIPMENT TYPE	# PIECES OF EQUIPMENT	HOURS/DAY	NUMBER OF DAYS	TOTAL TO BE PLACED (CYDS/TONS)	# OF DAILY HAUL TRUCKS	DISTANCE OF HAUL (MILES/ ROUND TRIP)
45 CY	Headworks	Concrete Pump and Trucks	2	8	1	45 CY	9	60 Miles RT
200 CY	Clarifiers	Concrete Pump and Trucks	2	8	2	200 CY	11	60 Miles RT
30 CY	RAS/WAS Pump Station	Concrete Pump and Trucks	2	8	1	30 CY	4	60 Miles RT
80 CY	Sludge Digester	Concrete Pump and Trucks	2	8	1	80 CY	9	60 Miles RT
210 CY	Sludge Drying Beds	Concrete Pump and Trucks	2	8	2	210 CY	11	60 Miles RT
100 Tons	AC Pavement (3500 SF)	Paving Machine , 2-Steel Drum Rollers, Skip Loader	4	8	1	100 Tons	6	80 Miles RT

Equipment Intallation			# PIECES OF EQUIPMENT	HOURS/DAY	NUMBER OF DAYS
2 EA	Influent Pumps	Crane, Forklift	2	4	2
1 EA	Headworks Screen	Crane, Forklift	2	8	1
3 EA	Biolac Blowers	Crane, Forklift	2	4	3
8 EA	Biolac diffuser tubes	Crane, Forklift	2	8	1
2 EA	Clarifier Mechanism	Crane, Forklift	2	8	2
2 EA	RAS/WAS Pumps	Crane, Forklift	2	8	1
2 EA	Sludge Blowers	Crane, Forklift	2	8	2
800 LF	Major Yard Piping	Backhoe, Forklift	2	3	40

9. Other agencies whose approval is required (e.g., permits, financing approval, or participation agreement.)

The amount of area to be disturbed by the whole project will be greater than one acre; therefore, the BCWD will be required to file a Notice of Intent (NOI) for a General Construction permit to comply with the National Pollutant Discharge Elimination System (NPDES) requirements. The NOI is filed with the State Water Resources Control Board and enforced by the Regional Water Quality Control Board. A Stormwater Pollution Prevention Plan (SWPPP) must be implemented in conjunction with construction activities.

In addition to the above, the District will be required to obtain permits from the following:

- WDR – Central Valley Regional Water Resources Control Board.
- License Agreement for Encroachment from the Buena Vista Water Storage District for the pipeline crossing the Eastside Canal
- Dust Control Plan through the San Joaquin Air Pollution Control District

No other agency approvals are known at this time.

10. Have California Native American tribes traditionally and cultural affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.3.1? If so, has consultation begun? *The District has not received letters requesting consultation from any Native American tribes. However, the cultural resources report (Appendix 4) did include Native American consultation through the Native American Heritage Commission, and three tribes expressed interest in the project. They will receive this Initial Study and can provide comments if they conclude the project area has potential Tribal Cultural Resource values.*

    Note: Conducting consultation early in the CEQA process allows tribal governments, lead agencies, and project proponents to discuss the level of environmental review, identify and address potential adverse impacts to tribal cultural resources, and reduce the potential for delay and conflict in the environmental review process. (See Public Resources Code section 21083.3.2.) Information may also be available from the California Native American Heritage Commission's Sacred Lands File per Public Resources Code section 5097.96 and the California Historical Resources Information System administered by the California Office of Historic Preservation. Please also note that Public Resources Code section 21082.3(c) contains provisions specific to confidentiality.

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. Note that through the implementation of mitigation measures all potentially significant impacts can be reduced to a less than significant impact level.

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

DETERMINATION (To be completed by the Lead Agency)

On the basis of this initial evaluation, the following finding is made:

☐	The proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
☒	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.
☐	The proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
☐	The proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
☐	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.

Tom Dodson & Associates
Prepared by

November 7, 2022
Date

Lead Agency (signature)

12/2/22
Date

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 off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

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 significance.

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

SUBSTANTIATION

a. *Less Than Significant Impact* – The proposed project site consists of flat topography located on the west side of the San Joaquin Valley in the unincorporated community of Buttonwillow, due west of the City of Bakersfield. Short-term construction activities will result in limited above-ground disturbance, including the wastewater treatment facilities and the proposed solar photovoltaic facility. These short-term term changes in the visual setting of project area will not adversely impact scenic vistas for two reasons. There are no residents in the vicinity of the proposed project and there are no important scenic vistas that will be impacted by the construction activities at the site. All of the proposed facilities will be installed at ground level or worst case in one story structures that will become part of the already disturbed views of adjacent rural development in the Buttonwillow area. The fact that the new facilities are being installed are at ground level, worst-case one-story structures, means they cannot interfere with any scenic vistas. No mitigation is required, and no significant adverse impact is forecast to any scenic vistas to the Coast Range and Sierra Nevada Range from implementing the proposed project.

b. *Less Than Significant Impact* – There are no scenic highways located within the community of Buttonwillow. All proposed pipeline facilities will be installed within the existing disturbed visual setting. The project area consists of the existing treatment plant site that will be replaced; an existing electric power transmission line that crosses the project site; agricultural modifications to the local environment; and public road rights-of-way (ROW) at ground level. These project locations do not contain any scenic resources that could be adversely impacted by installing these facilities. No mitigation is required, and no potential for significant adverse impact is forecast to result from implementing the proposed project.

c. *Less Than Significant Impact* – The proposed project facilities are all located in non-urbanized areas. The site location for the wastewater treatment plant is already dedicated to this use. Of the remaining areas to be disturbed, existing roadways and the existing east side canal are disturbed areas. Only the proposed location for the solar facility has recently been farmed, primarily for feed and fodder crops (alfalfa and savannah grass). The proposed solar facility will alter the existing view of this location, but due to the low profile of the solar panels, and the lack of public views to the site, this potential alteration of the site is not considered a significant adverse impact. Implementation of the proposed project will not conflict with scenic quality regulations. No mitigation is required, and no

significant adverse visual impact is forecast to result from implementing the whole of the proposed project at the project site.

d. *Less Than Significant Impact* – The implementation of the proposed Project will result in continuing a source of light during the construction and operational phases of the Project. Based on a review of the Aerial Photo in Figure 2, there are no light sensitive uses at the project treatment plant site vicinity. No significant change in lighting will be implemented to support the proposed project. Thus, the proposed project will continue a source of light at the treatment plant for safety and security, but no significant adverse impact on any light sensitive receptors is forecast to occur. No mitigation is required.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
II. AGRICULTURE AND FORESTRY RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
a) Convert Prime Farmland, Unique Farmland or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☒	☐
b) Conflict with existing zoning for agricultural use or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☒	☐

SUBSTANTIATION

a. *Less Than Significant Impact* – As the aerial photo in Figure 6 shows, the project site is surrounded by important farmland that is currently under cultivation. No farmland will be impacted by installing the proposed replacement WWTP as this land has already been removed from farming. However, the approximately two acres proposed for the solar field is located west of Meadow Street and in the past was under cultivation for feed and fodder crops (alfalfa or other forage crop). Thus, the proposed project will remove a small area of important farmland from farming activity. The location is part of the property owned by the District and is therefore not under Williamson Act contract. Based on the minor acreage that will be removed from production, the District concluded that this loss would not constitute a significant constitute a significant adverse environmental impact of the proposed project. As noted, the District owns this land that it purchased with the objective of providing adequate land area to meet the needs of the wastewater treatment responsibility for the community of Buttonwillow. See Figure 7 for the Farmland Map. No mitigation is required.

b. *No Impact* – Implementation of the proposed Project will not conflict with continued use of the remainder project site for agricultural production and according to the Kern County Williamson Act Parcels and Non-Renewal map, none of the project sites or alignments that will be disturbed are under Williamson Act contract. Based on this information, the proposed Project will not conflict with existing zoning for agricultural use, or a Williamson Act contract. No adverse impacts are anticipated and no mitigation is required.

c. *No Impact* – The project site is not located within forest land, timberland or timberland zoned for Timberland Production. Therefore, the proposed Project will not conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g)). No adverse impacts are anticipated and no mitigation is required.

d. *No Impact* – The project site is not located within forest land and has no commercial forest trees on any of the property proposed to support the proposed project; therefore, the project will not result in the loss of forest land or conversion of forest land to non-forest production use. No adverse impacts are anticipated and no mitigation is required.

e. *Less Than Significant Impact* – Please refer to the discussion under issue II(a), above. Although the proposed Project contains an approximate one-acre site the is designated as Farmland of Statewide Importance, the conversion of this small parcel to water supply production was concluded to constitute a less than significant project specific and cumulative impact within the surrounding community. Furthermore, there is no forest land in the vicinity of Project that would be impacted by the development of the proposed Project. Therefore, the proposed Project would have a less than significant potential to involve other changes in the existing environment which, due to their location or nature, could result in conversion of significant farmland resources, to non-agricultural use or conversion of forest land to non-forest use.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
III. AIR QUALITY: Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
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?	☐	☐	☒	☐

SUBSTANTIATION: Appendix 2 contains an air emission forecast for the proposed project, "Air Quality and GHG Impact Analyses Buttonwillow Wastewater Treatment Improvement Project Kern County, California" prepared by Giroux & Associates dated May 27, 2022. Most of the information provided below is abstracted from this report.

Background

Tables III-1 and III-2 summarize the current air quality standards and the health risks of air pollutants, respectively Baseline air quality is provided in Table III-3.

San Joaquin Valley Air Basin (SJVAB) includes San Joaquin County, Stanislaus County, Madera County, Fresno County, Kings County, Tulare County, and a portion of Kern County. Buttonwillow is at the southwestern end of the San Joaquin Valley Air Pollution Control District (SJVAPCD) in South Kern County and is located 20 miles west of downtown Bakersfield. Buttonwillow is a small, rural community with a population of about 1,300 residents. The community is located east of the Temblor Range (coastal mountains) and the southern Sierra Nevada Mountains to the east. The mountains surrounding the SJVAB restrict air movement through and out of the basin, and as a result, impede the dispersion of pollutants from the Basin.

Buttonwillow is primarily an agricultural community. In addition to being itself a farm community, it is surrounded on all sides by agricultural lands where operational pesticide use greatly impacts the city's air quality. These factors contribute to the community and its residents, experiencing some of the worst PM-2.5 levels in the nation. There is no government agency-sponsored monitor in Buttonwillow for PM-2.5. The closest PM-2.5 monitor is in southwest Bakersfield.

Away from the cooling effects of the Pacific Ocean, the climate of Kern County can be characterized as hot in summer and cold in winter, compared with the coastal basins where the climate is moderated by the adjacent ocean. The SVJAB has an "inland Mediterranean" climate averaging over 260 sunny days per year. The valley floor is characterized by hot summers and mild humid winters. Summer high temperatures often exceed 100°F while the average daily low temperature in the winter is 45°F. Temperatures below freezing are rare. Summer winds in the SJVAB usually originate at the north end of the San Joaquin Valley and flow in a south-southeasterly direction while winter winds originate from the south and flow in a north-northwesterly direction. Winds in the winter months tend to be variable and light; often less than 10 mph.

Precipitation in the San Joaquin Valley is strongly influenced by the position of the semi-permanent subtropical high-pressure zone located off the Pacific Coast. Most precipitation occurs in the winter months, with some occurring in late summer and fall. Average annual rainfall for the entire San Joaquin Valley is 9.25 inches on the valley floor.

Table III-1

Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards [1]		National Standards [2]		
		Concentration [3]	Method [4]	Primary [3,5]	Secondary [3,6]	Method [7]
Ozone (O_3)[8]	1 Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m^3)		0.070 ppm (137 µg/m^3)		
Respirable Particulate Matter (PM10)[9]	24 Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		—		
Fine Particulate Matter (PM2.5)[9]	24 Hour	—	—	35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	12.0 µg/m^3	15 µg/m^3	
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	35 ppm (40 mg/m^3)	—	Non-Dispersive Infrared Photometry (NDIR)
	8 Hour	9.0 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)	—	
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		—	—	
Nitrogen Dioxide (NO_2)[10]	1 Hour	0.18 ppm (339 µg/m^3)	Gas Phase Chemiluminescence	100 ppb (188 µg/m^3)	—	Gas Phase Chemiluminescence
	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)		0.053 ppm (100 µg/m^3)	Same as Primary Standard	
Sulfur Dioxide (SO_2)[11]	1 Hour	0.25 ppm (655 µg/m^3)	Ultraviolet Fluorescence	75 ppb (196 µg/m^3)	—	Ultraviolet Flourescence; Spectrophotometry (Pararosaniline Method)
	3 Hour	—		—	0.5 ppm (1300 µg/m^3)	
	24 Hour	0.04 ppm (105 µg/m^3)		0.14 ppm (for certain areas)[11]	—	
	Annual Arithmetic Mean	—		0.030 ppm (for certain areas)[11]	—	
Lead[12,13]	30 Day Average	1.5 µg/m^3	Atomic Absorption	—	—	High Volume Sampler and Atomic Absorption
	Calendar Quarter	—		1.5 µg/m^3 (for certain areas)[12]	Same as Primary Standard	
	Rolling 3-Month Average	—		0.15 µg/m^3		
Visibility Reducing Particles[14]	8 Hour	See footnote 14	Beta Attenuation and Transmittance through Filter Tape	No National Standards		
Sulfates	24 Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[12]	24 Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

See footnotes on next page …

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Table III-1 (continued)

1. California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM10, PM2.5, 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 PM10, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For PM2.5, 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 PM2.5 primary standard was lowered from 15 $\mu g/m^3$ to 12.0 $\mu g/m^3$. The existing national 24-hour PM2.5 standards (primary and secondary) were retained at 35 $\mu g/m^3$, as was the annual secondary standard of 15 $\mu g/m^3$. The existing 24-hour PM10 standards (primary and secondary) of 150 $\mu g/m^3$ 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_2 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_2 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 $\mu g/m^3$ 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.

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Table III-2
HEALTH EFFECTS OF MAJOR CRITERIA POLLUTANTS

Pollutants	Sources	Primary Effects
Carbon Monoxide (CO)	• Incomplete combustion of fuels and other carbon-containing substances, such as motor exhaust. • Natural events, such as decomposition of organic matter.	• Reduced tolerance for exercise. • Impairment of mental function. • Impairment of fetal development. • Death at high levels of exposure. • Aggravation of some heart diseases (angina).
Nitrogen Dioxide (NO_2)	• Motor vehicle exhaust. • High temperature stationary combustion. • Atmospheric reactions.	• Aggravation of respiratory illness. • Reduced visibility. • Reduced plant growth. • Formation of acid rain.
Ozone (O_3)	• Atmospheric reaction of organic gases with nitrogen oxides in sunlight.	• Aggravation of respiratory and cardiovascular diseases. • Irritation of eyes. • Impairment of cardiopulmonary function. • Plant leaf injury.
Lead (Pb)	• Contaminated soil.	• Impairment of blood function and nerve construction. • Behavioral and hearing problems in children.
Respirable Particulate Matter (PM-10)	• Stationary combustion of solid fuels. • Construction activities. • Industrial processes. • Atmospheric chemical reactions.	• Reduced lung function. • Aggravation of the effects of gaseous pollutants. • Aggravation of respiratory and cardio respiratory diseases. • Increased cough and chest discomfort. • Soiling. • Reduced visibility.
Fine Particulate Matter (PM-2.5)	• Fuel combustion in motor vehicles, equipment, and industrial sources. • Residential and agricultural burning. • Industrial processes. • Also, formed from photochemical reactions of other pollutants, including NOx, sulfur oxides, and organics.	• Increases respiratory disease. • Lung damage. • Cancer and premature death. • Reduces visibility and results in surface soiling.
Sulfur Dioxide (SO_2)	• Combustion of sulfur-containing fossil fuels. • Smelting of sulfur-bearing metal ores. • Industrial processes.	• Aggravation of respiratory diseases (asthma, emphysema). • Reduced lung function. • Irritation of eyes. • Reduced visibility. • Plant injury. • Deterioration of metals, textiles, leather, finishes, coatings, etc.

Source: California Air Resources Board, 2002.

Table III-3
AIR QUALITY MONITORING SUMMARY (2018-2020)
(Predicted Number of Days Standards Were Exceeded, and Maximum Levels During Such Violations)

Pollutant/Standard	2018	2019	2020
Ozone			
1-Hour > 0.09 ppm (S)	8	2	3
8-Hour > 0.07 ppm (S)	4	0	6
8- Hour > 0.075 ppm (F)	33	14	34
Max. 1-Hour Conc. (ppm)	0.098	0.087	0.116
Max. 8-Hour Conc. (ppm)	0.090	0.077	0.098
Nitrogen Dioxide			
1-Hour > 0.18 ppm (S)	0	0	0
Max. 1-Hour Conc. (ppm)	0.048	0.049	0.041
Respirable Particulates (PM-10)			
24-hour > 50 $\mu g/m^3$ (S)	13	17	18
24-hour > 150 $\mu g/m^3$ (F)	0	0	1
Max. 24-Hr. Conc. ($\mu g/m^3$)	136.1	116.3	193.8
Ultra-Fine Particulates (PM-2.5)			
24-Hour > 35 $\mu g/m^3$ (F)	36	12	44
Max. 24-Hr. Conc. ($\mu g/m^3$)	98.5	59.1	150.7

Source:
Ozone and NOx: Shafter at Smith Corner/Walker Street Station
PM-10 and PM-2.5: Bakersfield-California Avenue Station
data: www.arb.ca.gov/adam/

The San Joaquin Valley Air Pollution Control District (SJVAPCD) operates a regional monitoring network that measures the ambient concentration of criteria pollutants. Existing levels of criteria air pollutants in the project area can generally be inferred from measurements conducted by the SJVAPCD at its Bakersfield California Avenue monitoring station and the Shafter Smith Corner/Walker Street Station. There are no nearby stations that monitors CO.

Table III-3 summarizes the monitoring history from the Shafter and Bakersfield monitoring stations for the last three years. From these data one can infer that baseline air quality levels near the project site are occasionally unhealthful, but that such violations of clean air standards usually affect only those people most sensitive to air pollution exposure.

a. Photochemical smog (ozone) levels occasionally exceed standards. The 8-hour state ozone standard has been exceeded an average of one percent of all days in the past three years near the project site and the 8-hour federal was violated seven percent during the same period. The 1-hour state standard has been violated slightly more than one percent of all days in the last three years.

b. Respirable dust (PM-10) levels exceed the state standard 13 percent of all measurement days, but the less stringent federal PM-10 standard was only violated once for the same time period.

c. The federal ultra-fine particulate (PM-2.5) standard of 35 $\mu g/m^3$ is often exceeded. From the data observed, 31 percent of all measurement days exceeded the 35 $\mu g/m^3$ standard.

Although complete attainment of every clean air standard is not yet imminent, extrapolation of the steady improvement trend suggests that such attainment could occur within the reasonably near future.

Air Quality Planning

Fugitive dust emissions generated by construction activities are regulated by the SJVAPCD. Construction activities must comply with all applicable SJVAPCD rules and regulations, including SJVAPCD's Regulation VIII. Regulation VIII consists of several individual rules that require implementation of best available mitigation measures to limit construction dust emissions.

The San Joaquin Valley Air Basin has been determined by ARB and EPA to be in attainment of federal PM-10 standards. Regulation VIII has been accepted by ARB and EPA to maintain attainment of PM-10 standards in the Air Basin. In developing the 2007 Maintenance Plan, the SJVAPCD evaluated the potential PM-10 emissions that could occur under all sources within the Air Basin and developed rules and procedures to reduce future emissions sufficiently to maintain the existing attainment status. The full attainment status is shown in Table III-4.

Table III-4
SAN JOAQUIN VALLEY AIR BASIN ATTAINMENT STATUS[1]

Pollutant	Designation/Classification	
	Federal Standards	**State Standards**
Ozone – 1 Hour	Nonattainment/Extreme	Nonattainment/Severe
Ozone – 8 Hour	Nonattainment/Extreme	Nonattainment
PM-10*	Attainment	Nonattainment
PM 2.5	Nonattainment	Nonattainment
Carbon Monoxide	Attainment/Unclassified	Attainment/Unclassified
Nitrogen Dioxide	Attainment/Unclassified	Attainment
Sulfur Dioxide	Attainment/Unclassified	Attainment
Lead Particulates	No Designation	Attainment

*On September 25, 2008, EPA redesignated the San Joaquin Valley to attainment for the PM10 National Ambient Air Quality Standard (NAAQS) and approved the PM10 Maintenance Plan.

Air Quality Impact

Standards of Significance

Air quality impacts are considered "significant" if they cause clean air standards to be violated where they are currently met, or if they "substantially" contribute to an existing violation of standards. Any substantial emissions of air contaminants for which there is no safe exposure, or nuisance emissions such as dust or odors, would also be considered a significant impact.

Appendix G of the California CEQA Guidelines offers the following four tests of air quality impact significance. A project would have a potentially significant impact if it:

a. Conflicts with or obstructs implementation of the applicable air quality plan.
b. Results in a cumulatively considerable net increase of any criteria pollutants 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).

[1] https://www.valleyair.org/aqinfo/attainment.htm

c. Exposes sensitive receptors to substantial pollutant concentrations.
d. Creates objectionable odors affecting a substantial number of people.

The San Joaquin Valley Air Pollution Control District developed a CEQA Implementation Document that assigned an emissions level that it recommends should be considered as creating a potentially significant air quality impact. Construction projects are considered to have a significant air quality impact if they cause the following annual emissions to be exceeded (tons/year):

CO	-	100
NOx	-	10
ROG	-	10
SOx	-	27
PM-10	-	15
PM-2.5	-	15

The project is not expected to generate any new operational air quality emissions.

NEPA guidelines do not encourage designation of impacts as (in)significant. However, Section 176(c) of the Clean Air Act Amendments of 1990 prohibits federal participation in projects that would impede implementation of the state implementation plan (SIP) for federal non-attainment pollutants. "Participation" includes project funding as well as granting any federal permits. If the project-related emissions from construction and operations are less than specified "*de minimis*" levels, no further SIP consistency demonstration is required. San Joaquin Valley is designated as a non-attainment area for the federal 8-hour ozone standard. The basin is nonattainment for PM-2.5 and has been determined by ARB to be in attainment of federal PM-10 standards. Based upon these designations, the following emissions levels are presumed evidence of SIP conformity:[2]

Ozone VOX or NOx	10 tons/year
Carbon Monoxide	100 tons/year
PM-10	100 tons/year
PM-2.5	100 tons/year
NOx	100 tons/year

These *de minimis* thresholds are less stringent than the SJVAPCD CEQA thresholds. If project air quality impacts in the basin are less-than-significant under CEQA, they are automatically in conformance under NEPA.

The project is not expected to generate any new operational air quality emissions.

Construction Emissions

CalEEMod2020.4.0 was developed by the SCAQMD to provide a model by which to calculate both construction emissions and operational emissions from a variety of land use projects. It calculates both the daily maximum and annual average emissions for criteria pollutants as well as total or annual GHG emissions.

The proposed project consists of replacement of a small, poorly performing WWTP and installation of support facilities required to allow the Buttonwillow County Water District to meet waste discharge requirements with the treated effluent.

After evaluation of several alternatives, the Biolac Extended Aeration System, was selected as the recommended system for treatment and disposal. The Biolac system primarily consists of a concrete-lined aeration pond with two circular clarifiers.

[2] https://www.epa.gov/general-conformity/de-minimis-tables

Project engineering broke construction into three major activities. Excavation, concrete work, and equipment installation. The breakdown is shown below. For modeling purposes, the total number of hours for each piece of equipment was determined by phase and divided by the number of days in the phase for a daily average. This breakdown by construction phase is shown in Table 5.

Estimated construction emissions were modeled using CalEEMod2016.3.2 to identify maximum emissions for each pollutant during project construction. See construction equipment assumptions in Table III-5.

Table III-5
EXCAVATION / EARTHWORKS

Activity	Equipment	Hours/Day	Number of Days
Influent Pump Station	None	-	-
Headworks	Excavator, Loader, Water Truck	8	2
Biolac Pond	Scraper, Blade, Water Truck	8	8
Clarifiers	Excavator, Loader, Water Truck	8	3
RAS/WAS Pump Station	Excavator, Loader, Water Truck	8	2
Sludge Digester	Excavator, Loader, Water Truck	8	2
Sludge Drying Beds	Excavator, Loader, Water Truck	8	4
Yard piping	Backhoe, Loader, Water Truck	4	20
Misc site work	Backhoe, Loader, Water Truck	4	4

EXCAVATION / EARTHWORKS PHASE SUMMARY: AVERAGE FOR 45 DAYS OF ACTIVITY

Equipment	Total Hours for Phase	Average Hrs/Day
Excavator	104	2.3
Loader	200	4.4
Water Truck	264	5.9
Backhoe	96	2.1
Scraper	64	1.4
Blade	64	1.4

CONCRETE WORK

Activity	Equipment	Hours/Day	Number of Days
Headworks	Concrete Pump, Trucks	8	1
Biolac Pond	None	-	-
Clarifiers	Concrete Pump, Trucks	8	2
RAS/WAS Pump Station	Concrete Pump, Trucks	8	1
Sludge Digester	Concrete Pump, Trucks	8	1
Sludge Drying Beds	Concrete Pump, Trucks	8	2
AC Pavement	Paving Machine, Roller, Skip Loader	8	1

Table III-5 (continued)
CONCRETE WORK PHASE SUMMARY: AVERAGE FOR 8 DAYS OF ACTIVITY

Equipment	Total Hours for Phase	Average Hrs/Day
Concrete Pump	56	7.0
Truck	56	7.0
Paving Machine	8	1.0
Drum Roller	8	1.0
Skip Loader	8	1.0

EQUIPMENT INSTALLATION

Activity	Equipment	Hours/Day	Number of Days
Influent Pumps	Crane, Forklift	4	2
Headworks Screen	Crane, Forklift	8	1
Biolac Blowers	Crane, Forklift	4	3
Biolac diffuser tubes	Crane, Forklift	8	1
Clarifier Mechanism	Crane, Forklift	8	2
RAS/WAS Pumps	Crane, Forklift	8	1
Sludge Blowers	Crane, Forklift	8	2
Major Yard Piping	Backhoe, Forklift	3	40

EQUIPMENT INSTALLATION PHASE SUMMARY: AVERAGE FOR 52 DAYS OF ACTIVITY

Equipment	Total Hours for Phase	Average Hrs/Day
Concrete Pump	56	7.0
Truck	56	7.0
Paving Machine	8	1.0
Drum Roller	8	1.0
Skip Loader	8	1.0

Utilizing the equipment fleet and durations shown in Table III-5, the annual construction emissions are calculated by CalEEMod2020.4.0. and are shown in Table III-6. The emissions are compared to the NEPA and SJVAPCD thresholds.

Table III-6
CONSTRUCTION ACTIVITY EMISSIONS
MAXIMUM ANNUAL EMISSIONS (tons/year)

Maximal Construction Emissions	ROG	NOx	CO	SO_2	PM-10	PM-2.5
Excavation/Earthworks	0.02	0.16	0.16	<0.01	0.11	0.06
Concrete Work	<0.01	0.04	0.03	<0.01	0.11	0.06
Equipment Installation	<0.01	0.05	0.05	<0.01	<0.01	<0.01
NEPA Threshold	10	10	100	100	100	100
JQVAPCD Regional Emissions Threshold	10	10	100	27	15	15

Source: CalEEMod output in appendix

The three phases would be performed sequentially. However, even if they were to overlap, annual emissions would remain below CEQA and NEPA thresholds without the need for added mitigation. There are no standards for daily emissions.

Emissions will be well below significance thresholds. Locally, the mobile nature of these sources, the minimal surrounding receptor density and the regional spread of emissions from off-site construction vehicles would minimize the exposure to any individual receiver of any project-related construction emissions. These emissions, therefore have a less than significant individual impact, but would be added cumulatively to a large volume of non-project mobile source emissions within the Kern County area.

Operational Impacts

No new operations will be required a result of this project. Existing personnel will be trained to the level of certification required to support continued treatment of wastewater, but in compliance with Waste Discharge Requirements (WDRs).

Odor

Significance could also derive from emissions of odors or hazardous air pollutants. Replacement of the existing wastewater treatment system can generate odors because although new system treatment operations will improve, such systems can occasionally release hydrogen sulfide-like odors. However, due to the lack of local sensitive odor receptors in the project area, the potential for significant adverse odor impact is considered low.

CEQA Threshold Impacts

a. *Less Than Significant Impact* – The proposed project will replace an existing poor performing wastewater treatment plant (WWTP) with a new better performing WWTP and support facilities (potable water supply, paved roads, and solar photovoltaic power system). No change in primary land use will occur and the emissions generated by the proposed project during construction are well below the thresholds of significance. Thus, the proposed project will not conflict with or obstruct the applicable Kern County air quality management.

b. *Less Than Significant With Mitigation Incorporated* – The emission data indicate that the project related emissions are below significance thresholds and will not contribute in a cumulatively considerable impact in the San Joaquin Air Basin. However, to minimize emissions during construction several mitigation measures have been identified and are provided below. Construction emissions will be controlled to minimize contributions to ozone precursors and particulate matter emissions.

c. *Less Than Significant Impact* – Construction emissions are well below annual thresholds and have no potential to expose sensitive receptors to substantial pollutant concentrations. Furthermore, there are no nearby sensitive receptors to the project site.

d. *Less Than Significant Impact* – Based on the type of facilities (new WWTP, potable water pipeline and some road paving), no significant odor impacts are forecast to occur as a result of implementing the proposed project.

<u>Construction Emission Mitigation</u>

Construction activities are not anticipated to cause emissions to exceed CEQA or NEPA thresholds. Nevertheless, emissions minimization through enhanced dust control measures is required to comply with SJVAPCD Regulation VIII related to dust control.

AQ-1 Regulation VIII Control Measures for Construction Emissions of PM-10:

- ***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.***
- ***All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.***
- ***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.***
- ***With the demolition of buildings up to six stories in height, all exterior surfaces of the building shall be wetted during demolition.***
- ***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.***
- ***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.)***
- ***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.***
- ***Within urban areas, trackout shall be immediately removed when it extends 50 or more feet from the site and at the end of each workday.***
- ***An owner/operator of any site with 150 or more vehicle trips per day, or 20 or more vehicle trips per day by vehicles with three or more axles shall implement measures to prevent carryout and trackout.***

AQ-2 Recommended Enhanced Additional Measures for Construction Emissions of PM-10:

- ***Suspend excavation and grading activity when winds exceed 20 mph.***
- ***Limit area subject to excavation, grading, and other construction activity at any one time.***

AQ-3 Recommended for Heavy Duty Equipment (scrapers, graders, trenchers, earth movers, etc.):

- ***Use alternative fueled or catalyst equipped diesel construction equipment.***
- ***Minimize idling time (e.g., 5 minutes maximum).***
- ***Limit the hours of operation of heavy-duty equipment and/or the amount of equipment in use.***
- ***Where practical, replace fossil-fueled equipment with electrically driven equivalents (provided they are not run via a portable generator set).***
- ***Curtail construction during periods of high ambient pollutant concentrations; this may include ceasing of construction activity during the peak-hour of vehicular traffic on adjacent roadways.***
- ***Implement activity management (e.g., rescheduling activities to reduce short-term impacts).***

With implementation of the above measures potential non-significant construction emissions can be further minimized to the lowest achievable level.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
IV. BIOLOGICAL RESOURCES: Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☐	☒	☐
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☒	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☒	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

SUBSTANTIATION: The findings presented in this section rely upon two site specific Biology Resources Assessments (BRA) prepared for the project area. The 2019 BRA was prepared by Jericho Systems Incorporated, "Buttonwillow County Water District Wastewater Treatment Plant Improvement Project." The second BRA, "Buttonwillow BRA" was prepared by Jacobs dated June 6, 2022. These two documents are provided in Appendix 3 to this Initial Study.

The two BRA's made the following findings:

1. The project area is not located within or directly adjacent to any designated Critical Habitat.
2. A vacant parcel located southwest of the treatment plant contains suitable habitat for the San Joaquin kit fox, giant kangaroo rat and Tipton kangaroo rat. Kangaroo rat footprints were noted outside of the treatment plant site, adjacent to the west side of the access road. Although this is outside of the project footprint, due to the potential for sensitive resources, this area should be avoided by installing exclusionary fencing to minimize potential for indirect effects from the proposed project.
3. Within the WWTP project area and the proposed solar project area, there are no wetlands or jurisdictional features that will incur impacts. The potable water pipeline will cross the East Side Canal which is a man-made water conveyance canal. This area may contain limited wetland resources that could be disturbed during installation of the potable water pipeline. The goal is to

install the pipeline during the period when the Canal is shut-down for annual maintenance. Any vegetation can be set aside with the topsoil and restored after the water pipeline is installed.

4. Vegetation suitable for nesting birds does exist within the WWTP site, the solar facility site, and the potable water pipeline crossing of the East Side Canal. If construction in areas with vegetation can be conducted during the non-nesting season (September through February), nesting birds can be avoided. If all work cannot be conducted outside of the nesting season and existing vegetation is anticipated to be disturbed, a project specific nesting bird management plan can be prepared to define suitable buffers.
5. The project is not located within or adjacent to a water body designated by the Wild and Scenic Rivers Act.

Based on the preceding findings, the following impacts are forecast to occur if the proposed project is implemented.

a. *Less Than Significant With Mitigation Incorporated* – Based on the biology field studies, no listed, candidate, or sensitive species were identified within the project's footprint, including the WWTP site, solar site, or roadways that will be paved or host the proposed potable water pipeline. However, suitable habitat and some evidence of sensitive species was identified southwest of the project site. Therefore, the following mitigation measure will be implemented.

BIO-1 ***Install an exclusionary fence along the west side of Meadow Street from the East Side Canal north to the location selected for the solar facility. A qualified biological monitor shall be onsite during installation of the exclusionary fence and during initial ground disturbing activities. All construction work shall be performed during daylight hours.***

BIO-2 ***Provide worker environmental awareness training to all on-site personnel. All employees shall receive this training prior to being allowed access to the work site. The training shall be provided by a qualified profession familiar with the sensitive species that may be encountered at the project site.***

BIO-3 ***The District shall have a qualified biologist conduct a pre-construction kit fox burrow survey within the proposed project area of potential impact prior to initiating any ground disturbing activities. If occupied burrows are identified, the District will obtain FESA and/or CESA incidental take permits as required.***

With implementation of the preceding measures, potential indirect impacts on sensitive species can be avoided.

b. *Less Than Significant Impact* – No riparian habitat or other sensitive natural community occurs within the project footprint, so no direct impact on such resources will occur from implementing the proposed project. Marginal habitat for sensitive species does occur within the project vicinity and mitigation measures **BIO-1, BIO-2** and **BIO-3** will be implemented to minimize potential for indirect adverse impact to sensitive species.

c. *Less Than Significant With Mitigation Incorporated* – Based on the biology field studies, no state or federally protected wetlands (waters of the U.S. or waters of the State) will be impacted by the proposed project. This finding is based on implementing the following mitigation measure.

BIO-4 ***The potable water pipeline crossing of the East Side Canal will disturb the East Side Canal channel, however, this pipeline shall either be installed using jack and bore techniques under the Canal or the crossing can be trenched across the Canal during the annual Canal maintenance period after the canal has dried out. Any surface vegetation/topsoil shall be excavated and set aside to be reinstalled along the pipeline alignment after the pipeline is installed. If trenching is selected as the method to install the water pipeline across the***

East Side Canal, the District shall contact the Central Valley RWQCB (Fresno Office) to determine whether a WDR must be obtained before disturbance within the Canal and obtain such permit if directed by the RWQCB.

It is anticipated that actual trenching and pipe laying across the Canal can be completed within approximately four days with all channel crossing equipment and material staged prior to cutting the trench, installing the water pipeline, and closing the trench.

d. *Less Than Significant With Mitigation Incorporated* – Based on the biology field studies, a potential does exist for nesting birds to occur within the project area. No other wildlife movement corridors or wildlife nurseries are known to occur within the project area. The following mitigation measure shall be implemented to minimize potential to adversely impact nesting birds.

BIO-5 The project construction shall avoid bird nesting season in the project area where vegetation is present with nesting bird activity, September 1 through March 1, or a pre-construction nesting bird survey shall be implemented. If nesting birds are encountered within the project construction sites or the general area, a project specific nesting bird management plan shall be prepared of define suitable buffers, which shall be implemented as part of the project.

e. *No Impact* – There are no trees or other biological resources within the project area that are protected by local policies or ordinances. Therefore, no potential exists for the proposed project to conflict with such policies or ordinances.

f. *No Impact* – There are adopted habitat conservation plans, natural community conservation plans, or other adopted plans that encompass the proposed project area. Therefore, no potential exists for the proposed project to conflict with such plans.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
V. CULTURAL RESOURCES: Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	☐	☒	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☒	☐	☐
c) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☒	☐

SUBSTANTIATION: The information in this section is based on a cultural resources technical report: "Identification and Evaluation of Historic Properties Buttonwillow County Water District Wastewater Treatment Plant Improvements Project Near the Community of Buttonwillow Kern County, California;" prepared by CRM TECH dated October 14, 2022. A copy of this document with certain sensitive data deleted is provided in Appendix 4 of this Initial Study.

Background and Summary of Findings

Between March and October 2022, CRM TECH performed a cultural resources study on the Area of Potential Effects (APE) for the BCWD WWTP Improvements Project near the unincorporated community of Buttonwillow, Kern County, California. The APE consists of approximately 16.7 acres of land 0.6 linear mile of pipeline right-of-way in and around the existing WWTP, located on the south side of Sullivan Road between Buttonwillow Drive and Wasco Way, in the west half of Section 13, T29S, R23E, Mount Diablo Baseline and Meridian, as depicted on the United States Geological Survey (USGS) Buttonwillow, California, 7.5' quadrangle map. The APE is depicted on the aerial photograph provided in Figure 6.

The proposed undertaking entails primarily the expansion of and improvement to the existing WWTP, including construction of a new headwork, an operations building, electrical facilities, a paved access road, and other ancillary facilities. The maximum depth of excavation required for the undertaking, or the vertical extent of the APE will not exceed 10 feet. As part of the environmental review process for the undertaking, the study is required by BCWD and the State Water Resources Control Board (SWRCB) in compliance with the California Environmental Quality Act (CEQA) and Section 106 of the National Historic Preservation Act (NHPA), in a process known as CEQA-Plus.

The purpose of the study was to provide BCWD and SWRCB with the necessary information and analysis to determine whether the proposed undertaking would have an effect on any "historic properties," as defined by 36 CFR 800.16(1), or "historical resources" as defined by Calif. PRC §5020.1(j), that may exist in or near the APE. In order to accomplish this objective, CRM TECH conducted a cultural resources records search, historical and geoarchaeological background research, Native American consultation, and an intensive-level field survey of the entire APE.

As a result of the preceding research procedures, five cultural resources were identified as lying within or partially within the APE, as listed below:

- Site 15-13735: East Side Canal, circa 1870s;
- Isolate 3856-1*: prehistoric lithic flake;
- Isolate 3856-2*: prehistoric lithic flake;

- Isolate 3856-3*: prehistoric lithic flake;
- Site 3856-4H*: existing BCWD WWTP, circa 1956-1967.

*Temporary designations, pending assignment of official identification numbers in the California Historical Resources Inventory

Among these, the East Side Canal was previously determined ineligible for listing in the National Register of Historic Places or the California Register of Historic Resources, mainly due to the lack of historic integrity. With regards to the short segment of the canal across the linear portion of the APE, the present study concurs with this determination. Similarly, the existing WWTP has been significantly expanded and upgraded with modern equipment in recent years and does not retain sufficient integrity to relate to the historic period. Furthermore, it does not meet any of the criteria for listing in the National Register or California Register. Therefore, neither of the two sites qualify as a "historic property" under Section 106 provisions or a "historical resource" under CEQA.

Each of the three prehistoric isolates consists of a single lithic flake that appears to represent the result of secondary deposition from unknown origins. Such isolates, or localities with fewer than three artifacts, by definition do not qualify as archaeological sites due to the lack of contextual integrity. As such, they do not constitute potential "historic properties"/"historic resources" and require no further consideration. No other features or artifacts of prehistoric or historical origin were encountered within or adjacent to the APE, and the extensively disturbed subsurface sediments in the vertical APE appear to be relatively low in sensitivity for potentially significant archaeological remains of prehistoric or early historic origin.

Based on the research results summarized above, and pursuant to 36 CFR 800.4(d)(1) and Calif. PRC §21084.1, CRM TECH recommends to BCWD and SWRCB a conclusion that *no "historic properties" or historical resources" will be affected by the proposed undertaking.* No further cultural resources investigation is recommended for the undertaking unless project plans undergo such changes as to include areas not covered by this study. However, if buried cultural materials are discovered during earth-moving operations associated with the undertaking, all work in the immediate area should be halted or diverted until a qualified archaeologist can evaluate nature and significance of the find.

Impact Evaluation

a&b. *Less Than Significant With Mitigation Incorporated* – The historical and archaeological resources report provided as Appendix 3 summarizes the findings of a cultural resources records search and field survey that was completed for this Project. The cultural resources report identified three isolated artifacts within the APE and concluded that these items do not qualify as historic properties or historical resources based on the evaluation criteria. However, as stated in the background summary above, contingency mitigation is recommended to ensure the possibility of salvaging any accidentally exposed subsurface resources. As such, the following mitigation measure shall be implemented. Thus, if buried cultural materials are accidentally exposed/ discovered during any earth-moving operations associated with the Project, the following mitigation measure shall be implemented:

CUL-1 Should any subsurface or other cultural resources be encountered during construction of the proposed project, earthmoving or grading activities in the immediate area of the finds shall be halted and an onsite inspection shall be performed immediately by a qualified archaeologist. The archaeological professional shall assess the find, determine its significance, and make recommendations for appropriate management measures within the guidelines of the California Environmental Quality Act. The recommendations shall be implemented by the District.

With the above contingency mitigation incorporation, potential for impact to cultural resources will be reduced to a less than significant level. No additional mitigation is required.

Vc. *Less Than Significant Impact – N*o available information suggests that human remains may occur within the APE and the potential for such an occurrence is considered very low. Any human remains discovered during the project implementation will need to be treated in accordance with the provisions of HSC §7050.5 and PRC §5097.98, which is mandatory. State law (Section 7050.5 of the Health and Safety Code) as well as local laws requires that the Police Department, County Sheriff and Coroner's Office receive notification if human remains are encountered. Compliance with these laws is considered adequate mitigation for potential impacts to human remains and no further mitigation is required.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
VI. ENERGY: Would the project:				
a) Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operations?	☐	☒	☐	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☒	☐	☐

SUBSTANTIATION

a&b. *Less Than Significant With Mitigation Incorporated* – The proposed project consists of replacing a poor performing WWTP in Buttonwillow with a new WWTP, including support facilities (potable water pipeline, paved access road, and solar photovoltaic system. These activities will consume energy during construction and during future operations (primarily to operate the WWTP). However, once construction is completed, the solar photovoltaic facility will offset a substantial amount of the electricity required to operate WWTP. During construction, the proposed project will utilize construction equipment that is CARB approved, minimizing emissions generated and electricity required to the extent feasible (as outlined under Section III, Air Quality, above). As stated in Section III, Air Quality, the construction of the proposed Buttonwillow Wastewater Treatment Plant Improvement Project would require mitigation measures to minimize emissions impacts from construction equipment use (refer to MM **AIR-3**). These mitigation measures also apply to energy resources as they require equipment not in use for 5 minutes to be turned off, and for electrical construction equipment to be used where available. These measures would prevent a significant impact during construction due to wasteful, inefficient, or unnecessary consumption of energy resources, and would also conform to the CARB regulations regarding energy efficiency.

During future operations overall energy use may increase for the new Biolac treatment unit, but the new solar facility will generate electricity that will offset average daily energy use by the facility. With a new, more energy efficient WWTP, energy consumed for wastewater treatment operations should be reduced relative to the existing condition. Energy consumption encompasses many different activities. For example, construction can include the following activities: delivery of equipment and material to a site from some location (note it also requires energy to manufacture the equipment and material, such as harvesting, cutting and delivering wood from its source); employee trips to work, possibly offsite for lunch (or a visit by a catering truck), travel home, and occasionally leaving a site for an appointment or checking another job; use of equipment onsite (electric or fuel); and sometimes demolition and disposal of construction waste. To minimize energy costs of construction debris management, mitigation has been established to require diversion of all material capable of being recycled. The project will meet this requirement. Energy consumption by construction equipment will be reduced by requiring shutdowns when equipment is not in use after five minutes and ensuring equipment is being operated within proper operating parameters (tune-ups) to minimize emissions and fuel consumption. These requirements are consistent with State and regional rules and

regulations. Under the construction scenario outlined above, the proposed project will not result in wasteful, inefficient, or unnecessary energy consumption during construction.

The proposed project is currently, and will continue to be powered by Pacific Gas & Electric (PG&E) through the power distribution system located within the project area. PG&E will be able to supply sufficient electricity, as the proposed use would likely utilize less energy than previously for the reasons outlined above. The project site will not require natural gas to operate. Security lighting must be constructed in conformance with a variety of existing energy efficiency regulatory requirements or guidelines including:

- Compliance California Green Building Standards Code, AKA the CALGreen Code (Title 24, Part 11), which became effective on January 1, 2017. The purpose of the CALGreen Code is to improve public health, safety, and general welfare by enhancing the design and construction of building through the use of building concepts encouraging sustainable construction practices.
- Compliance with diversion of construction and demolition materials from landfills.
- Compliance with AQMD Mandatory use of low-pollutant emitting finish materials.
- Compliance with AQMD Rules 431.1 and 431.2 to reduce the release of undesirable emissions.
- Compliance with diesel exhaust emissions from diesel vehicles and off-road diesel vehicle/equipment operations.

Compliance with these regulatory requirements for operational energy use and construction energy use would not be a wasteful or unnecessary use of energy. Under both the operational and construction scenarios for the proposed project, with implementation of MM **AQ-3**, the proposed project will not result in wasteful, inefficient, or unnecessary energy consumption that could result in a significant adverse impact to energy issues based on compliance with the referenced laws, regulations, and guidelines.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
VII. GEOLOGY AND SOILS: Would the project:				
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
(i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
(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 onsite or offsite land-slide, 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 where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐

SUBSTANTIATION

The proposed project consists of a new replacement WWTP and support facilities; potable water pipeline; paving access road(s); and installation of a solar photovoltaic electricity generation system. None of these facilities will be occupied by humans.

a. (i) *No Impact* – According to the County of Kern General Plan, Figure 13, the community of Buttonwillow is not underlain by any known active faults. The nearest named fault is the San Andreas Fault located about 25 miles west of Buttonwillow. The potential for significant adverse impact from fault rupture activity within the project area is concluded to constitute no adverse impact to the proposed WWTP facilities.

(ii) *Less Than Significant Impact* – According to the General Plan EIR (Page 4.1-7) most of Kern County is subject to moderate to extreme seismic ground shaking. Due to general proximity to the

San Andreas Fault (Figure 13, General Plan), Buttonwillow could experience substantial seismic ground shaking in the future. However, the type of uninhabited wastewater infrastructure proposed by this project are not particularly subject to ground shaking damage, and if removed from operation can readily be repaired by District contractors. Based on the lack of human risk, requirements to meet current Uniform Building Code design for seismic ground shaking, and the ability to quickly repair the wastewater infrastructure, if damaged by ground shaking, the potential adverse impact from seismic ground shaking is concluded to be a less than significant impact.

(iii) *Less Than Significant Impact* – The County General Plan does not identify any liquefaction hazards in the Buttonwillow area (GP Figure 14). Thus, the project area has a low to negligible potential for liquefaction hazard for the proposed water infrastructure facilities. Based on these findings, the potential adverse impact from liquefaction or other seismic ground failure is concluded to be a less than significant impact.

(iv) *No Impact* – Buttonwillow is located on the valley-floor of the San Joaquin Valley in western Kern County. There are no elevated areas in the vicinity of Buttonwillow from which a landslide (sediment or rock) could originate. Based on these findings, the potential adverse impact from a landslide at all the proposed project locations is a no impact finding.

b. *Less Than Significant With Mitigation Incorporated* – Given the total area of the proposed Buttonwillow project, it is anticipated that more than one-acre of ground disturbance will occur in relation to the treatment system, solar field, and pipeline installation. As a result, the proposed project will be required to prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) during construction. Site specific best management practices (BMPs) shall be implemented to minimize erosion and sedimentation. Mitigation is provided below to ensure SWPPP implementation. Because the disturbances will occur within existing disturbed ROWs and disturbed sites, it should not be necessary to implement long-term BMPs as they should already be installed at the various sites.

GEO-1 The construction contractor shall prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) which specifies Best Management Practices that will prevent construction pollutants from contacting stormwater with the intent of keeping all products of erosion from moving offsite into receiving waters. The SWPPP may include but not be limited to the following BMPs.

- ***The length of trench which can be left open at any given time should be limited to that needed to reasonably perform construction activities. This will serve to reduce the amount of backfill stored onsite at any given time.***
- ***Backfill material should not be stored in areas which are subject to the erosive flows of water.***
- ***Stored backfill material should be covered with water resistant material during periods of heavy precipitation to reduce the potential for rainfall erosion of stored backfill material. If covering is not feasible, then measures such as the use of straw bales, sandbags, silt fencing or detention/desilting basins shall be used to capture and hold eroded material on the project site for future cleanup.***
- ***The SWPPP shall include a spill prevention and cleanup plan to account for the accidental release of petroleum products or other contaminants during construction activities. This plan shall identify the methods of containing spills, the methods of removing and disposing of spills and the notification procedures to the appropriate regulatory agencies with jurisdiction over such spills.***
  - ***Apply erosion and sediment control design that reduce volume and velocity of flows and content of sediment to levels that do not cause significant rill or gully erosion in susceptible areas. In addition, provide for restoration of areas that do become eroded.***

- ***Add protective covering of mulch, straw or synthetic material (erosion control blankets, tacking will be required).***
- ***Limit the amount of area disturbed and the length of time slopes and barren ground are left exposed. After pipeline installation, soil shall be compacted to a level similar to pre-construction conditions.***
- *C**onstruct diversion dikes and interceptor ditches to divert water away from construction areas.***

Implementation of the preceding measure and other measures within the Hydrology/Water Quality are deemed sufficient to control the potential for adverse erosion impacts associated with installation of the proposed facilities.

c. *Less Than Significant Impact* – Based on a review of the Kern County Safety Element, Figure 15, there is no known geotechnical stability hazard in the Project area, including subsidence. Given this circumstance, the proposed project site will not be subject to significant subsidence hazards.

d. *No Impact* – The soils underlying the proposed Buttonwillow wastewater infrastructure facilities are alluvial sands and silts that are not considered as expansive soils that could pose hazards to the proposed improvements. Therefore, no potential exists for this project to create a substantial risk to life or property under this issue.

e. *No Impact* – The purpose of the project is to install new wastewater infrastructure to provide wastewater treatment that complies with Waste Discharge Requirements in the community of Buttonwillow. This project will not generate any wastewater itself and will not require subsurface septic tank or alternative wastewater management systems to be installed or utilized. No adverse impact can occur under this impact category.

f. *Less Than Significant With Mitigation Incorporated* – Based on the type of sediments at this site (alluvial) and the highly disturbed nature of the ROWs, no paleontological resources should be impacted by the proposed project. The project consists of installing one pipeline and earthwork for the WWTP and the solar facility within existing ROWs or disturbed areas. Although the installation of the new facilities will occur within existing disturbed engineering surfaces, the following contingency mitigation measure shall be implemented if subsurface construction activities accidentally expose paleontological resources:

GEO-2 In the event that paleontological resources are encountered within the project area during construction activities, all land modification activities in the immediate area of the finds should be halted and an onsite inspection shall be performed immediately by a qualified paleontologist. This professional will be able to assess the find, determine its significance, and make recommendations for appropriate management actions. Reasonable paleontological resource management actions shall be implemented to protect the accidentally exposed subsurface resources.

With implementation of this mitigation measure, the potential adverse impacts to paleontological resources can be reduced to a less than significant impact level.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
VIII. GREENHOUSE GAS EMISSIONS: Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

SUBSTANTIATION: Appendix 2 contains an GHG emission forecast for the proposed project, "Air Quality and GHG Impact Analyses Buttonwillow Wastewater Treatment Improvement Project Kern County, California" prepared by Giroux & Associates dated May 27, 2022. Most of the information provided below is abstracted from this report.

Background

"Greenhouse gases" (so called because of their role in trapping heat near the surface of the earth) emitted by human activity are implicated in global climate change, commonly referred to as "global warming." These greenhouse gases contribute to an increase in the temperature of the earth's atmosphere by transparency to short wavelength visible sunlight, but near opacity to outgoing terrestrial long wavelength heat radiation in some parts of the infrared spectrum. The principal greenhouse gases (GHGs) are carbon dioxide, methane, nitrous oxide, ozone, and water vapor. For purposes of planning and regulation, Section 15364.5 of the California Code of Regulations defines GHGs to include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride. Fossil fuel consumption in the transportation sector (on-road motor vehicles, off-highway mobile sources, and aircraft) is the single largest source of GHG emissions, accounting for approximately half of GHG emissions globally. Industrial and commercial sources are the second largest contributors of GHG emissions with about one-fourth of total emissions.

California has passed several bills and the Governor has signed at least three executive orders regarding greenhouse gases. GHG statues and executive orders (EO) include AB 32, SB 1368, EO S-03-05, EO S-20-06 and EO S-01-07.

AB 32 is one of the most significant pieces of environmental legislation that California has adopted. Among other things, it is designed to maintain California's reputation as a "national and international leader on energy conservation and environmental stewardship." It will have wide-ranging effects on California businesses and lifestyles as well as far reaching effects on other states and countries. A unique aspect of AB 32, beyond its broad and wide-ranging mandatory provisions and dramatic GHG reductions are the short time frames within which it must be implemented. Major components of the AB 32 include:

- Requires the monitoring and reporting of GHG emissions beginning with sources or categories of sources that contribute the most to statewide emissions.
- Requires immediate "early action" control programs on the most readily controlled GHG sources.
- Mandates that by 2020, California's GHG emissions be reduced to 1990 levels.
- Forces an overall reduction of GHG gases in California by 25-40%, from business as usual (BAU) practices by 2020.
- Dictates that any local initiatives must complement efforts to achieve and maintain federal and state ambient air quality standards and to reduce toxic air contaminants.

Statewide, the framework for developing the implementing regulations for AB 32 is under way. Maximum GHG reductions are expected to derive from increased vehicle fuel efficiency, from greater use of renewable energy and from increased structural energy efficiency.

Greenhouse Gas Emissions Significance Thresholds

In response to the requirements of SB97, the State Resources Agency developed guidelines for the treatment of GHG emissions under CEQA. These new guidelines became state laws as part of Title 14 of the California Code of Regulations in March, 2010. The CEQA Appendix G guidelines were modified to include GHG as a required analysis element. A project would have a potentially significant impact if it:

- Generates GHG emissions, directly or indirectly, that may have a significant impact on the environment, or,

- Conflicts with an applicable plan, policy or regulation adopted to reduce GHG emissions.

Section 15064.4 of the Code specifies how significance of GHG emissions is to be evaluated[3]. The process is broken down into quantification of project-related GHG emissions, making a determination of significance, and specification of any appropriate mitigation if impacts are found to be potentially significant. At each of these steps, the new GHG guidelines afford the lead agency with substantial flexibility.

Emissions identification may be quantitative, qualitative, or based on performance standards. CEQA guidelines allow the lead agency to "select the model or methodology it considers most appropriate". The most common practice for transportation/combustion GHG emissions quantification is to use a computer model such as CalEEMod, as was used in the ensuing analysis.

In the Final Staff Report Addressing GHG Emissions Impacts under CEQA, the SJVAPCD notes that ARB staff derived a proposed hybrid threshold consisting of a quantitative threshold of 7,000 metric tons of CO_2 equivalent per year ($MTCO_2E$/year) for operational emissions (excluding transportation), and performance standards for construction and transportation emissions (CARB).

ARB concludes in its draft proposal that the 7,000 $MTCO_2e$/year benchmark can be used to effectively mitigate industrial projects with significant GHG emissions. To date, ARB has not finalized its draft proposed threshold, nor has ARB scheduled additional workshops to seek public input on establishing a significance threshold for assessing significance of project specific GHG emission impacts on global climate change. However, in the absence of any other guidance, this 7,000 MT per year recommendation has been used as a guideline for this analysis.

Impact Evaluation

a. *Less Than Significant Impact* – The project is assumed to require less than two years for construction. During project construction, the CalEEMod2020.4.0 computer model predicts the emissions shown in Table VIII-1.

   The annual total of almost 59 MT CO_2e is much less than the adopted threshold for use by this project. GHG impacts from construction are considered less-than-significant.

[3] https://www.cacities.org/UploadedFiles/LeagueInternet/1c/1c6e4716-42eb-4a2d-ac42-1353a6283a47.pdf

Table VIII-1
ANNUAL CONSTRUCTION GHG EMISSIONS

Activity	**$MTCO_2e$/year**
Excavation/Earthworks	37.0
Concrete Work	13.5
Equipment Installation	8.3
Total	**58.8**

During operations the project will consume electricity (for WWTP operations and pumping water), but the source of the electricity is not well documented, and therefore the volume of GHG emissions cannot be attributed to specific emissions of GHG related to electricity. Furthermore, much of the electricity demand for the proposed project will be offset by the solar photovoltaic electricity generation. Other emissions associated with operations, such as maintenance, will remain essentially the same as for the existing WWTP.

b. *Less Than Significant Impact* – In December 2009 the SJVAPCD issued a final staff report addressing greenhouse gas emissions under CEQA. That language directly related to this project states that the lead agency should identify GHG emissions based on available information to calculate, model or estimate the amount of CO_2 and other GHG emissions.

With regard to consistency with existing air quality plans, it was determined that because the proposed project would not generate population, residences, or substantial employment, it would neither conflict with nor interfere with the County's adopted growth forecast. Furthermore, as shown in this report, the proposed project's contribution to regional air emissions in the San Joaquin Valley would be very small and are only one time construction emissions. When compliance with applicable rules, such as the SJVAPCD's required emissions controls is considered, the proposed project's regional contribution to cumulative air quality and GHG impacts would be almost negligible.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
IX. HAZARDS AND HAZARDOUS MATERIALS: Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☒	☐	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☒	☐	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☐	☒
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☒	☐	☐
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☐	☒

SUBSTANTIATION

a. *Less Than Significant With Mitigation Incorporated* – The proposed project consists of a replacement WWTP, new potable water pipeline, paving an access road, and installation and operation of a new solar photovoltaic facility. No routine use of substantial quantities of hazardous materials will occur in conjunction with project operations.

b. *Less Than Significant With Mitigation Incorporated* – The project may 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. During construction there is a potential for accidental release of petroleum products in sufficient quantity to pose a significant hazard to people and the environment. The following mitigation measure will be incorporated into the Storm Water Pollution Prevention Plan (SWPPP) prepared for the project and implementation of this measure can reduce this potential hazard to a less than significant level.

HAZ-1 ***All spills or leakage of petroleum products during construction activities will be remediated in compliance with applicable state and local regulations regarding cleanup and disposal of the contaminant released. The contaminated waste will be collected and disposed of at an appropriately licensed***

disposal or treatment facility. This measure will be incorporated into the SWPPP prepared for the Project development.

c. *Less Than Significant Impact* – None of the facilities proposed for installation under the proposed project are located within one-quarter mile of existing schools. The proposed project must follow the extensive legal and regulatory requirements in storage, handling, and disposal of any hazardous materials utilized at the site during construction and operation. Based on compliance with these regulatory requirements and the lack of any sensitive school receptors in the project area, the proposed project is not forecast to result in any significant exposure of any school to significant hazards. No mitigation is required.

d. *No Impact* – Based on a review of the known hazardous site data bases, the project site is not identified as having any known hazardous contamination.

e. *No Impact* – There are no airports located in the vicinity of the proposed project sites; therefore, no potential exists for conflicts between the project and any airport operations.

f. *Less Than Significant Impact* – Although the project is not located on a major evacuation route, the project will be installing a water pipeline in Meadow Street. Since this is not a through street at the project site, no traffic not related the WWTP is anticipated on Meadow. Sullivan is an east-west rural local road that will not experience substantial disturbance from project implementation. There are no residences located in the project vicinity that could have interruptions in emergency services. Therefore, the proposed project is not forecast to impair or interfere with an adopted emergency response plan or emergency evacuation plan.

g. *No Impact* – The project site is located in a rural agricultural area with no wildland fire hazard areas in the vicinity of any project sites. With no substantial wildland fuel load in the project area, no potential for exposure to a significant wildland fire hazard exists for the proposed project.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
X. HYDROLOGY AND WATER QUALITY: Would the project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	☐	☒	☐	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such the project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
(i) result in substantial erosion or siltation onsite or offsite?	☐	☒	☐	☐
(ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding onsite or offsite?	☐	☐	☒	☐
(iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?; or,	☐	☐	☒	☐
(iv) impede or redirect flood flows?	☐	☐	☐	☒
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	☒
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☒	☐

SUBSTANTIATION

a. *Less Than Significant With Mitigation Incorporated* – There are three potential sources of water quality degradation: municipal wastewater; direct discharges of pollutants; and indirect discharges of pollutants. This project's elements include the treatment of wastewater in an up-graded, replacement WWTP. The specific purpose of the new WWTP is to replace the existing treatment system which has not been able to meet the current Waste Discharge Requirements. Please refer to the discussion of this issue in Appendix 1. The new WWTP will be issued new Waste Discharge Requirements (WDR) from the Central Valley Regional Water Quality Control Board and will be required to comply with the new WDR based on the WWTP system installed or augmented as needed. Therefore, the potential to violate water quality standards or degrade water quality from the new WWTP is considered a less than significant potential impact

During the construction to install the various elements of the proposed project, construction activities have a potential to cause indirect discharges of sediment or to concentrate flows and cause erosion. This potential during construction will be controlled by implementing the SWPPP mandated in mitigation measure, **GEO-1**. Once the various project elements are installed and the ROWs or

disturbed sites are returned to their pre-existing condition, the existing drainage patterns on the project sites will continue to function and will control long term potential for erosion and sedimentation. Implementation of measure **GEO-1** is considered sufficient to prevent the project from causing significant water quality degradation.

b. *Less Than Significant Impact* – *Th*e proposed project will utilize minimal groundwater to support operations. Runoff from the new impervious areas resulting from the proposed project will be captured on the site and percolated at this location. Total potential impervious surface is only a few acres and given the surrounding area consists of agricultural land, the potential impact will not impede any applicable sustainable groundwater management program for the area aquifer. Overall, the proposed project will not substantially interfere with groundwater recharge within the region.

c. (i) *Less Than Significant With Mitigation Incorporated* – All of the proposed project site locations are located within a rural environment where existing drainage patterns have been established due to land ownership patterns in the area. The permanent changes to drainage are minor (approximately four acres in the project area, and spread out over the general project area). Thus, minimal increases in surface runoff will result. During construction, mitigation measure **GEO-1** will ensure that substantial erosion and siltation will not occur at the various project sites and the final design will incorporate standard Water Quality Management Plan controls over long-term runoff from the sites. Overall impact under this issue is considered to be a less than significant impact.

c. (ii) *Less Than Significant Impact* – The project facility sites are too small (area of disturbance is typically about one acre with a maximum of just over two acres) to substantially increase the rate or amount of surface runoff that would result in flooding onsite or offsite. The WWTP, water pipeline, and roadway improvements will be installed at ground level and will only minimally increase impervious surface. None of these activities will substantially increase runoff and/or cause flooding onsite or offsite.

c. (iii) *Less Than Significant Impact* – Based on the amount of disturbed area spread out over the project footprint north of the community of Buttonwillow, the proposed project will not contribute runoff that would exceed the capacity of the existing drainage systems serving the proposed facilities and would also not serve as a substantial additional source of polluted runoff. Overall impact under this issue is considered to be a less than significant impact.

c. (iv) *No Impact* – None of the proposed project facilities occur within the path of flood hazard areas. Therefore, the proposed project has no potential to impede or redirect flood flows.

d. *No Impact* – The project area is not subject to either a seiche or tsunami due to the lack of any source of water to generate such hazards. Regarding flood hazards, the FEMA FIRM Panels for the project area are provided in Appendix 5. The project area is identified as being in Zone AE and Zone X. The project area is not located in a high flood hazard zone.

e. *Less Than Significant Impact* – Please refer to the discussions under issues X.a) and X.b) above. The issues of conflict with a water quality control plan or sustainable groundwater management plan are addressed in these two sections of the Initial Study. No significant adverse impacts to these two issues will result from implementing the proposed project.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
XI. LAND USE AND PLANNING: Would the project:				
a) Physically divide an established community?	☐	☐	☒	☐
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

SUBSTANTIATION

a. *Less Than Significant Impact – T*he proposed project will not alter land use within the WWTP, pipeline, or roadway project areas. These activities will remain the same after development. The only new feature to the project area will be the solar facility that will utilize a couple of acres currently allocated to agricultural use. However, none of these facilities has any potential to divide any existing community as none occur within the project area. Impact under this issue is considered to be a less than significant impact.

b. No *Impact* – Water and wastewater facilities are zone and general plan independent because they consist of essential infrastructure that is required to support all land uses. The only new use proposed for the project area is the new solar photovoltaic facilities. The purpose of installing this facility is to provide an alternative, renewable source of energy to offset costs of operating the WWTP. Since these land uses will represent consistent support for the proposed project, no conflicts with any land use plan or policy for mitigating adverse environmental effects will result from project implementation.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
XII. MINERAL RESOURCES: Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
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?	☐	☐	☐	☒

SUBSTANTIATION:

a&b. The project area is developed with a mix of existing wastewater treatment facilities and agricultural uses. No known mineral resources are known to occur within the project area. Limited oil extraction occurs in the general area but none of the proposed wastewater infrastructure occurs in areas with above ground oil infrastructure. No potential for adverse impact to mineral resources or mineral resource values will result from project implementation.

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

SUBSTANTIATION

Background

The proposed project consists of a replacement WWTP, potable water line, roadway paving, and a new solar facility. Noise is generated in the following manner by these activities. Construction of each of the primary project components will generate noise and operation of the WWTP will generate low levels of noise during treatment operations. The proposed roadway improvements, potable water pipeline, and the solar photovoltaic facility will generate minimal noise levels during operations. Installation of pipelines generates noise, but once installed below ground the pipelines do not generate noise that is audible during operations. Closure (demolition) of the existing WWTP facilities wells will also generate some noise during construction. Thus, some limited short-term noise is likely to be associated with installation of the proposed facilities and minimal noise will be generated during operations. Equally important, there are no sensitive noise receptors closer than 1/2 mile of the project area.

Noise is generally described as unwanted sound. The unit of sound pressure ratio to the faintest sound detectable to a person with normal hearing is called a decibel (dB). Sound or noise can vary in intensity by over one million times within the range of human hearing. A logarithmic loudness scale, similar to the Richter scale for earthquake magnitude, is therefore used to keep sound intensity numbers at a convenient and manageable level. The human ear is not equally sensitive to all sound frequencies within the entire spectrum. Noise levels at maximum human sensitivity from around 500 to 2,000 cycles per second are factored more heavily into sound descriptions in a process called “A-weighting,” written as “dBA.”

Leq is a time-averaged sound level; a single-number value that expresses the time-varying sound level for the specified period as though it were a constant sound level with the same total sound energy as the time-varying level. Its unit is the decibel (dB). The most common averaging period for Leq is hourly.

Because community receptors are more sensitive to unwanted noise intrusion during more sensitive evening and nighttime hours, state law requires that an artificial dBA increment be added to quiet time noise levels. The State of California has established guidelines for acceptable community noise levels that are based on the Community Noise Equivalent Level (CNEL) rating scale (a 24-hour integrated noise measurement scale). The guidelines rank noise land use compatibility in terms of "normally acceptable," "conditionally acceptable," and "clearly unacceptable" noise levels for various land use types. The State Guidelines, Land Use Compatibility for Community Noise Exposure, single-family homes are "normally acceptable" in exterior noise environments up to 60 dB CNEL and "conditionally acceptable" up to 70 dB CNEL based on this scale. Multiple family residential uses are "normally acceptable" up to 65 dB CNEL

and "conditionally acceptable" up to 70 CNEL. Schools, libraries and churches are "normally acceptable" up to 70 dB CNEL, as are office buildings and business, commercial and professional uses with some structural noise attenuation.

a. *Less Than Significant Impact With Mitigation Incorporated* – Implementation of the proposed project will generate noise. Generally, large construction equipment can generate noise levels of about 70 to 90 dBA at a distance of 50 feet from the equipment. This is the highest noise exposure from the project activities, as all construction activities will occur during daylight hours. This increase in noise levels will be short term. The increased noise levels will not be severe enough to pose a health or hearing hazard, but could be considered a short-term nuisance. Additionally, to reduce potential short-term effects of noise and long-term noise effects from all project construction activities to the greatest extent feasible, the mitigation measures presented below will be implemented.

NOI-1 Buttonwillow County Water District (BCWD) will require that all construction equipment be operated with mandated noise control equipment (mufflers or silencers). Enforcement will be accomplished by random field inspections by District personnel during construction activities.

NOI-2 Although there are no nearby sensitive noise receptors, construction activities shall be generally limited to the hours of 7 a.m. to 6 p.m. on Monday through Friday, and between 9 a.m. to 6 p.m. on Saturday, and shall be prohibited on Sundays and federal holidays except during documented emergencies. No construction may occur during hours of "Darkness" (Night Work), as defined in the California Vehicle Code, Section 280, unless prior authorization is obtained from the County.

NOI-3 All employees that will be exposed to noise levels greater than 75 dB over an 8-hour period shall be provided with adequate hearing protection devices to ensure no hearing damage will result from construction activities.

Implementation of the preceding mitigation measure can help reduce noise exposures from all proposed project activities, both construction and operation, to a less than significant impact level.

b. *Less Than Significant Impact* – Vibration is the periodic oscillation of a medium or object. The rumbling sound caused by vibration of room surfaces is called structure borne noises. Sources of groundborne vibrations include natural phenomena (e.g. earthquakes, volcanic eruptions, sea waves, landslides) or human-made causes (e.g. explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous or transient. Vibration is often described in units of velocity (inches per second), and discussed in decibel (dB) units in order to compress the range of numbers required to describe vibration. Vibration impacts related to human development are generally associated with activities such as well drilling operations, construction, and heavy truck movements.

The background vibration-velocity level in residential areas is generally 50 VdB; Groundborne vibration is normally perceptible to humans at approximately 65 VdB, while 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible. Construction activity can result in varying degrees of groundborne vibration. While no enforceable regulations for vibration exist within the County of Kern, the Federal Transit Association (FTA) guidelines identify a level of 80 VdB for sensitive land uses. This threshold provides a basis for determining the relative significance of potential project-related vibration impacts. Due to the lack of sensitive vibration receptors within one-half mile of the site, no potentially significant vibration impacts will result from project implementation.

c. *No Impact* – The project site is not located near an airport and will not experience any aircraft or airport-related noise impacts.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
XIV. POPULATION AND HOUSING: Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

SUBSTANTIATION

a&b. *No Impact* – The proposed project will provide new WWTP system improvements for the community of Buttonwillow. The project has no potential to induce growth or displace existing occupied residences.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
XV. PUBLIC SERVICES: 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 govern-mental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
a) Fire protection?	☐	☐	☐	☒
b) Police protection?	☐	☐	☐	☒
c) Schools?	☐	☐	☐	☒
d) Parks?	☐	☐	☐	☒
e) Other public facilities?	☐	☐	☐	☒

SUBSTANTIATION

a&b. *No Impact* – The installation and utilization of the new WWTP system facilities have no potential to create any demand for fire or law enforcement protection services that would require new or altered facilities. The proposed project has a positive benefit because it will ensure adequate treatment of wastewater generated by the Buttonwillow community. No adverse impacts to fire and law enforcement services or facilities are forecast to result from project implementation.

c-e. *No Impact* – This includes “other public facilities” which will have sufficient capacity in the future to meet WWTP needs that will be generated by the Buttonwillow community in the future.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
XVI. RECREATION:				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

SUBSTANTIATION

a&b. *No Impact* – The installation and utilization of the WWTP system facilities have no potential to create any demand for recreational facilities that would require new or altered facilities.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
XVII. TRANSPORTATION: Would the project:				
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☒	☐
b) Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	☐	☐	☒	☐
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous inter-sections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
d) Result in inadequate emergency access?	☐	☒	☐	☐

SUBSTANTIATION

CEQA Section 15064.3, subdivision (b):
(1) Land Use Projects. Vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high-quality transit corridor should be presumed to cause a less than significant transportation impact. Projects that decrease vehicle miles traveled in the project area compared to existing conditions should be presumed to have a less than significant transportation impact.

(2) Transportation Projects. Transportation projects that reduce, or have no impact on, vehicle miles traveled should be presumed to cause a less than significant transportation impact. For roadway capacity projects, agencies have discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements. To the extent that such impacts have already been adequately addressed at a programmatic level, such as in a regional transportation plan EIR, a lead agency may tier from that analysis as provided in Section 15152.

(3) Qualitative Analysis. If existing models or methods are not available to estimate the vehicle miles traveled for the particular project being considered, a lead agency may analyze the project's vehicle miles

traveled qualitatively. Such a qualitative analysis would evaluate factors such as the availability of transit, proximity to other destinations, etc. For many projects, a qualitative analysis of construction traffic may be appropriate.

(4) Methodology. A lead agency has discretion to choose the most appropriate methodology to evaluate a project's vehicle miles traveled, including whether to express the change in absolute terms, per capita, per household or in any other measure. A lead agency may use models to estimate a project's vehicle miles traveled, and may revise those estimates to reflect professional judgment based on substantial evidence. Any assumptions used to estimate vehicle miles traveled and any revisions to model outputs should be documented and explained in the environmental document prepared for the project. The standard of adequacy in Section 15151 shall apply to the analysis described in this section.

a. *Less Than Significant Impact* – The project site is located in a rural area of western Kern County. State Route (SR) 58 is located about one mile south of the project area and Interstate 5 (I-5) is located about two miles east of the Buttonwillow community. The project site is accessed from SR 58 (east-west), to Wasco Way (north-south), and then Sullivan Road (east-west) to Meadow Street. Refer to Figure 2 for a visual representation of this access. During project construction an estimated 40-50 trips per day may occur. With the exception of SR 58, the other roadways have minimal traffic and 40-50 average trips per day will not alter the level of service on either Wasco or Sullivan. Once the facilities are placed in operation, minimal trips (at most a couple trips per day) will be required to maintain and operate the proposed facilities. Therefore, the potential for conflict with any circulation system qualities is minimal. No mitigation is required.

b. *Less Than Significant Impact* – The only period of trip generation associated with the proposed project will be during construction which is forecast to be completed over an 18-month period. Potential trips during operations will be *de minimus* (maybe a couple trips per day), therefore, this proposed project has no potential to conflict with long-term Vehicle Miles Traveled (VMT) goals. No mitigation is required.

e. *No Impact* – The proposed project will not make any changes to the existing circulation system except to pave certain roadways. This will result in safer roadways, and no mitigation is required.

d. *Less Than Significant With Mitigation Incorporated* – The proposed project will carry out construction on the local circulation system. A portion of Meadow and a segment of Sullivan will experience construction activities (pipeline installation and paving, respectively). Therefore, a potential does exist for project activities to interfere with or have an impact on emergency access. The following mitigation measure shall be implemented.

TRAN-1 ***The District shall require the contractors working within local roadways to prepare a construction traffic control plan. Elements of the plan should include, but are not necessarily limited to, the following:***

- ***develop circulation and detour plans, if necessary, to minimize impacts to local street circulation. Use haul routes minimizing truck traffic on local roadways to the extent possible.***
- ***To the extent feasible, and as needed to avoid adverse impacts on traffic flow, schedule truck trips outside of peak morning and evening commute hours.***
- ***Install traffic control devices as specified in Caltrans' Manual of Traffic Controls for Construction and Maintenance Work Zones where needed to maintain safe driving conditions. Use flaggers and/or signage to safely direct traffic through construction work zones.***
- ***For roadways requiring lane closures that would result in a single open lane, maintain alternate one-way traffic flow and utilize flagger-controls.***
- ***Emergency access shall be available to first-responders at all times.***

With implementation of this measure emergency access to the projects area can be maintained during construction activities within affected roadways.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
XVIII. TRIBAL CULTURAL RESOURCES: Would the project cause a substantial change in the significance of tribal cultural resources, 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 the California Native American tribe, and that is:				
a) 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	☐	☐	☐	☒
b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in sub-division (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☒	☐	☐

SUBSTANTIATION

a. *No Impact* – The BCWD has not received any requests for tribal consultation under AB 52. In addition, the cultural resources survey determined that the project APE does not contain any Historic properties or historic resources. Based on this information, no impact would occur under this issue.

b. *Less Than Significant with Mitigation Incorporation* - Although the District has not been contacted by any Native American Tribes under AB 52, the cultural resources team obtained and contacted potentially interested Native American Tribal representatives. These contacts are documented on page 13 of the cultural resources report provided as Appendix 4 to this Initial Study. Three of the tribes responded to the cultural resource teams' inquiry. The respondents were the Big Pine Paiute Tribe, Santa Rosa Rancheria, and Tejon Indian Tribe. All three tribes requested that Native American monitoring be implemented during ground-disturbing activities within the APE. Although none of these tribes have previously contacted the BCWD, they will be provided copies of this Initial Study for review and comment. To address their concerns, the following mitigation measure will be implemented by the BCWD.

TCR-1 ***The District shall initiate contact with the three tribes and discuss/determine which tribal government will be afforded the opportunity to conduct monitoring of ground disturbing activities within the APE when the project is constructed. The terms of the monitoring shall be defined during these discussions.***

With implementation of ***TCR-1*** any potential impacts to Tribal Cultural Resources can be managed to a less than significant impact level.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
XIX. UTILITIES AND SERVICE SYSTEMS: Would the project:				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment, or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☒	☐
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☒	☐
c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☒	☐
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☒	☐	☐
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☒	☐	☐

SUBSTANTIATION

a. *Less Than Significant Impact* – The proposed project consists of the replacement of an existing poorly functioning wastewater treatment plant with a new WWTP and the installation of a new potable water pipeline to serve the WWTP site. Based on the analysis of these new facilities in this Initial Study, the implementation of this proposed project will not result in any significant adverse environmental effects with implementation of mitigation. This issue does not require any further mitigation.

b. *Less Than Significant Impact* – The existing WWTP does not currently have a potable water supply. The proposed project will extend a potable water pipeline within the Meadow Street right- of-way. The water will be used to support operations of the new WWTP that will be installed by this proposed project. The volume of water that will be used will be limited, estimated to be a few hundred gallons per day at most. This is less water than would be consumed by a single-family residence with four occupants. This volume of water is considered *de minimus* within the Buttonwillow County Water District.

c. *Less Than Significant Impact* – The proposed project consists of the replacement of an existing poorly functioning wastewater treatment plant with a new WWTP. The purpose is to install a new WWTP that can adequately treat the wastewater to meet Waste Discharge Requirements. The new WWTP is being designed to treat the current volume of wastewater with sufficient capacity to meet forecast growth. Refer to the discussion of the preferred WWTP alternative in Appendix 1. No potential for significant adverse impacts to wastewater management will result from implementing the proposed project and no mitigation is required.

d&e. *Less Than Significant With Mitigation Incorporated* – The proposed project will generate a limited amount of solid waste during construction. Once the new WWTP is installed and operational, the

District will demolish the existing WWTP facilities which will result in the generation of demolition waste. Due to the past disturbance only minimal vegetation will need to be cleared from all project footprints. However, the following mitigation measure shall be implemented to minimize waste delivered to a landfill.

UTIL-1 ***The contract with demolition and construction contractors for each future proposed development within the proposed project shall include the requirement that all materials that can feasibly be recycled shall be salvaged and recycled. This includes, but is not limited to, wood, metals, concrete, road base, asphalt, vegetation, and demolition materials. The contractor shall submit a recycling plan to the District for review and approval prior to the start of demolition/construction activities to accomplish this objective.***

With implementation of this measure waste disposal can be minimized during construction activities. Future biosolids will be disposed of consistent with historical practices at the WWTP.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
XX. WILDFIRE: If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
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 wildfire?	☐	☐	☐	☒
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?	☐	☐	☐	☒
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?	☐	☐	☐	☒

SUBSTANTIATION

a-d. *No Impact* – The project area is rural and agricultural (refer to Figures 2 and 6) and has no wildland fire hazards within or adjacent to the project area. Therefore, the proposed project cannot impair an adopted emergency response plan or evacuation plan; cannot expose project occupants to pollutant concentration from a wildfire or to uncontrolled spread of wildfire; will not require installation of any infrastructure that could exacerbate fire risk; or expose people or structures to post-fire risks. No mitigation is required.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
XXI. 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?	☐	☒	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☒	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

SUBSTANTIATION

The analysis in this Initial Study and the findings reached indicate that the proposed Project can be implemented without causing any new project specific or cumulatively considerable unavoidable significant adverse environmental impacts. Mitigation is required to control certain potential environmental impacts of the proposed Project to a less than significant impact level. The following findings are based on the detailed analysis of the Initial Study of all environmental topics and the implementation of the mitigation measures identified in the previous text and summarized following this section.

a. *Less Than Significant With Mitigation Incorporated* – The biological and cultural technical reports (Appendices 3 and 4) indicate that limited biological or cultural resources of significance occur within the project area of potential effect. However, contingency mitigation measures were identified to address the potential for encountering protected kit fox and nesting birds and accidental exposure of subsurface cultural resources. With implementation of these measures, it was determined that the proposed project would not cause any unavoidable significant adverse impacts.

b. *Less Than Significant Impact* – The proposed Project consists of installing new equipment at the Buttonwillow WWTP and providing support facilities, including potable water, paved access, and a solar system to reduce energy demand. No unavoidable significant adverse environmental impacts have been identified for those issues that have a potential for cumulative impact. These issues include: aesthetics, agricultural air quality, biology, cultural resources, energy, greenhouse gases, hydrology/water quality, land use, noise, population and housing, public services, recreation, traffic, tribal cultural resources, utilities and service systems, and wildfire. Of these issues, air quality, biology, cultural resources, geology and soils, hazards and hazardous materials, hydrology/water quality, noise, traffic, tribal cultural resources, and utilities/service systems require mitigation. All identified mitigation measures will be implemented by the proposed project. Most potential adverse environmental impacts will be experienced during construction to achieve the long-term goal of upgrading the WWTP to meet current wastewater discharge requirements. The potential cumulative environmental effects of implementing the proposed Project have been determined to be less than considerable and thus, less than significant impacts.

c. *Less Than Significant With Mitigation Incorporated* – The proposed Project includes activities that have a potential to cause direct substantial adverse effects on humans. The issues of Air Quality, Geology and Soils, Hazards & Hazardous Materials, Hydrology, and Noise require the implementation of mitigation measures to reduce potential impacts to humans to a less than significant level. All other environmental issues were found to have no significant impacts on humans without implementation of mitigation. The potential for direct human effects from implementing the proposed Project have been determined to be less than significant.

Conclusion

This document evaluated all CEQA issues contained in the latest Initial Study Checklist form (2022). The evaluation determined that either no impact or less than significant impacts would be associated with the issues of Aesthetics, Agriculture and Forestry Resources, Land Use and Planning, Mineral Resources, Population and Housing, Public Services, and Wildfire. The issues of Air Quality, Biological Resources, Cultural Resources, Geology & Soils, Hazards & Hazardous Materials, Hydrology & Water Quality, Noise, Transportation, Tribal Cultural Resources, and Utilities and Service Systems require the implementation of mitigation measures to reduce potential project specific and cumulative impacts to a less than significant level. The required mitigation has been proposed in this Initial Study to reduce impacts for these issues to a less than significant impact level.

Based on the evidence and findings in this Initial Study, the Buttonwillow County Water District proposes to adopt a Mitigated Negative Declaration for the Buttonwillow WWTP Improvement Project. A Notice of Intent to Adopt a Mitigation Negative Declaration (NOI) will be issued for this Project by the BCWD. The Initial Study and NOI will be circulated for 30 days of public comment. At the end of the 30-day review period, a final MND package will be prepared and it will be reviewed by the District for possible adoption at a future Board meeting, the date for which has yet to be determined. If you or your agency comments on the MND/NOI for this Project, you will be notified about the meeting date in accordance with the requirements in Section 21092.5 of CEQA (statute).

Note: Authority cited: Sections 21083 and 21083.05, Public Resources Code. Reference: Section 65088.4, Gov. Code; Sections 21080(c), 21080.1, 21080.3, 21083, 21083.05, 21083.3, 21093, 21094, 21095, and 21151, Public Resources Code; *Sundstrom v. County of Mendocino*,(1988) 202 Cal.App.3d 296; *Leonoff v. Monterey Board of Supervisors*, (1990) 222 Cal.App.3d 1337; *Eureka Citizens for Responsible Govt. v. City of Eureka* (2007) 147 Cal.App.4th 357; *Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th at 1109; San *Franciscans Upholding the Downtown Plan v. City and County of San Francisco* (2002) 102 Cal.App.4th 656.

Revised 2019
Authority: Public Resources Code sections 21083 and 21083.09
Reference: Public Resources Code sections 21073, 21074, 21080.3.1, 21080.3.2, 21082.3/ 21084.2 and 21084.3

SUMMARY OF MITIGATION MEASURES

Air Quality

AQ-1 Regulation VIII Control Measures for Construction Emissions of PM-10:

- 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.
- All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.
- 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.
- With the demolition of buildings up to six stories in height, all exterior surfaces of the building shall be wetted during demolition.
- 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.
- 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.)
- 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.
- Within urban areas, trackout shall be immediately removed when it extends 50 or more feet from the site and at the end of each workday.
- An owner/operator of any site with 150 or more vehicle trips per day, or 20 or more vehicle trips per day by vehicles with three or more axles shall implement measures to prevent carryout and trackout.

AQ-2 Recommended Enhanced Additional Measures for Construction Emissions of PM-10:

- Suspend excavation and grading activity when winds exceed 20 mph.
- Limit area subject to excavation, grading, and other construction activity at any one time.

AQ-3 Recommended for Heavy Duty Equipment (scrapers, graders, trenchers, earth movers, etc.):

- Use alternative fueled or catalyst equipped diesel construction equipment.
- Minimize idling time (e.g., 5 minutes maximum).
- Limit the hours of operation of heavy-duty equipment and/or the amount of equipment in use.
- Where practical, replace fossil-fueled equipment with electrically driven equivalents (provided they are not run via a portable generator set).
- Curtail construction during periods of high ambient pollutant concentrations; this may include ceasing of construction activity during the peak-hour of vehicular traffic on adjacent roadways.
- Implement activity management (e.g., rescheduling activities to reduce short-term impacts).

Biological Resources

BIO-1 Install an exclusionary fence along the west side of Meadow Street from the East Side Canal north to the location selected for the solar facility. A qualified biological monitor shall be onsite during installation of the exclusionary fence and during initial ground disturbing activities. All construction work shall be performed during daylight hours.

BIO-2 Provide worker environmental awareness training to all on-site personnel. All employees shall receive this training prior to being allowed access to the work site. The training shall be provided by a qualified profession familiar with the sensitive species that may be encountered at the project site.

BIO-3 The District shall have a qualified biologist conduct a pre-construction kit fox burrow survey within the proposed project area of potential impact prior to initiating any ground disturbing activities. If occupied burrows are identified, the District will obtain FESA and/or CESA incidental take permits as required.

BIO-4 The potable water pipeline crossing of the East Side Canal will disturb the East Side Canal channel, however, this pipeline shall either be installed using jack and bore techniques under the Canal or the crossing can be trenched across the Canal during the annual Canal maintenance period after the canal has dried out. Any surface vegetation/topsoil shall be excavated and set aside to be reinstalled along the pipeline alignment after the pipeline is installed. If trenching is selected as the method to install the water pipeline across the East Side Canal, the District shall contact the Central Valley RWQCB (Fresno Office) to determine whether a WDR must be obtained before disturbance within the Canal and obtain such permit if directed by the RWQCB.

BIO-5 The project construction shall avoid bird nesting season in the project area, where vegetation is present, September 1 through March 1, or a pre-construction nesting bird survey shall be implemented. If nesting birds are encountered within the project construction sites or the general area, a project specific nesting bird management plan shall be prepared of define suitable buffers, which shall be implemented as part of the project.

Cultural Resources

CUL-1 Should any subsurface or other cultural resources be encountered during construction of the proposed project, earthmoving or grading activities in the immediate area of the finds shall be halted and an onsite inspection shall be performed immediately by a qualified archaeologist. The archaeological professional shall assess the find, determine its significance, and make recommendations for appropriate management measures within the guidelines of the California Environmental Quality Act. The recommendations shall be implemented by the District.

Geology and Soils

GEO-1 The construction contractor shall prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) which specifies Best Management Practices that will prevent construction pollutants from contacting stormwater with the intent of keeping all products of erosion from moving offsite into receiving waters. The SWPPP may include but not be limited to the following BMPs.

- The length of trench which can be left open at any given time should be limited to that needed to reasonably perform construction activities. This will serve to reduce the amount of backfill stored onsite at any given time.
- Backfill material should not be stored in areas which are subject to the erosive flows of water.
- Stored backfill material should be covered with water resistant material during periods of heavy precipitation to reduce the potential for rainfall erosion of stored backfill material. If covering is not feasible, then measures such as the use of straw bales, sandbags, silt fencing or detention/desilting basins shall be used to capture and hold eroded material on the project site for future cleanup.
- The SWPPP shall include a spill prevention and cleanup plan to account for the accidental release of petroleum products or other contaminants during construction activities. This plan shall identify the methods of containing spills, the methods of removing and disposing of spills and the notification procedures to the appropriate regulatory agencies with jurisdiction over such spills.

- Apply erosion and sediment control design that reduce volume and velocity of flows and content of sediment to levels that do not cause significant rill or gully erosion in susceptible areas. In addition, provide for restoration of areas that do become eroded.
- Add protective covering of mulch, straw or synthetic material (erosion control blankets, tacking will be required).
- Limit the amount of area disturbed and the length of time slopes and barren ground are left exposed. After pipeline installation, soil shall be compacted to a level similar to pre-construction conditions.
- Construct diversion dikes and interceptor ditches to divert water away from construction areas.

GEO-2 In the event that paleontological resources are encountered within the project area during construction activities, all land modification activities in the immediate area of the finds should be halted and an onsite inspection shall be performed immediately by a qualified paleontologist. This professional will be able to assess the find, determine its significance, and make recommendations for appropriate management actions. Reasonable paleontological resource management actions shall be implemented to protect the accidentally exposed subsurface resources.

Hazards and Hazardous Materials

HAZ-1 All spills or leakage of petroleum products during construction activities will be remediated in compliance with applicable state and local regulations regarding cleanup and disposal of the contaminant released. The contaminated waste will be collected and disposed of at an appropriately licensed disposal or treatment facility. This measure will be incorporated into the SWPPP prepared for the Project development.

Noise

NOI-1 Buttonwillow County Water District (BCWD) will require that all construction equipment be operated with mandated noise control equipment (mufflers or silencers). Enforcement will be accomplished by random field inspections by District personnel during construction activities.

NOI-2 Construction activities shall be generally limited to the hours of 7 a.m. to 6 p.m. on Monday through Friday, and between 9 a.m. to 6 p.m. on Saturday, and shall be prohibited on Sundays and federal holidays except during documented emergencies. No construction may occur during hours of "Darkness" (Night Work), as defined in the California Vehicle Code, Section 280, unless prior authorization is obtained from the County.

NOI-3 All employees that will be exposed to noise levels greater than 75 dB over an 8-hour period shall be provided with adequate hearing protection devices to ensure no hearing damage will result from construction activities.

Transportation

TRAN-1 The District shall require the contractors working within local roadways to prepare a construction traffic control plan. Elements of the plan should include, but are not necessarily limited to, the following:

- develop circulation and detour plans, if necessary, to minimize impacts to local street circulation. Use haul routes minimizing truck traffic on local roadways to the extent possible.
- To the extent feasible, and as needed to avoid adverse impacts on traffic flow, schedule truck trips outside of peak morning and evening commute hours.
- Install traffic control devices as specified in Caltrans' Manual of Traffic Controls for Construction and Maintenance Work Zones where needed to maintain safe driving

conditions. Use flaggers and/or signage to safely direct traffic through construction work zones.

- For roadways requiring lane closures that would result in a single open lane, maintain alternate one-way traffic flow and utilize flagger-controls.
- Emergency access shall be available to first-responders at all times.

Tribal Cultural Resources

TCR-1 The District shall initiate contact with the three tribes and discuss/determine which tribal government will be afforded the opportunity to conduct monitoring of ground disturbing activities within the APE when the project is constructed. The terms of the monitoring shall be defined during these discussions.

Utilities and Service Systems

UTIL-1 The contract with demolition and construction contractors for each future proposed development within the proposed project shall include the requirement that all materials that can feasibly be recycled shall be salvaged and recycled. This includes, but is not limited to, wood, metals, concrete, road base, asphalt, vegetation, and demolition materials. The contractor shall submit a recycling plan to the District for review and approval prior to the start of demolition/construction activities to accomplish this objective.

REFERENCES

CRM TECH, "Identification and Evaluation of Historic Properties, Buttonwillow County Water District Wastewater Treatment Plant Improvements Project" dated October 14, 2022

Giroux & Associates, "Air Quality and GHG Impact Analyses, Buttonwillow Wastewater Treatment Improvement Project, Kern County, California" dated May 27, 2022

Jacobs, "Buttonwillow BRA for Buttonwillow County Water District Wastewater Treatment Plant Improvements Project" dated June 6, 2022

Jericho Systems Incorporated, "Biological Resources Assessment for Buttonwillow County Water District Wastewater Treatment Plant Improvement Project" dated May 20, 2019

Kern County General Plan, September 22, 2009

Revised Update of Kern County General Plan and Amendment of the Kern County and Incorporated Cities Integrated Waste Management Plan Siting Element, Recirculated Draft Program Environmental Impact Report (SCH#2002071027), January 2004

Provost & Pritchard Consulting Group, "Buttonwillow County Water District, Wastewater Treatment Plan Improvements Project, Clean Water State Revolving Fund Project Report" dated _____

Websites

https://www.valleyair.org/aqinfo/attainment.htm

https://www.epa.gov/general-conformity/de-minimis-tables

https://www.cacities.org/UploadedFiles/LeagueInternet/1c/1c6e4716-42eb-4a2d-ac42-1353a6283a47.pdf

FIGURES

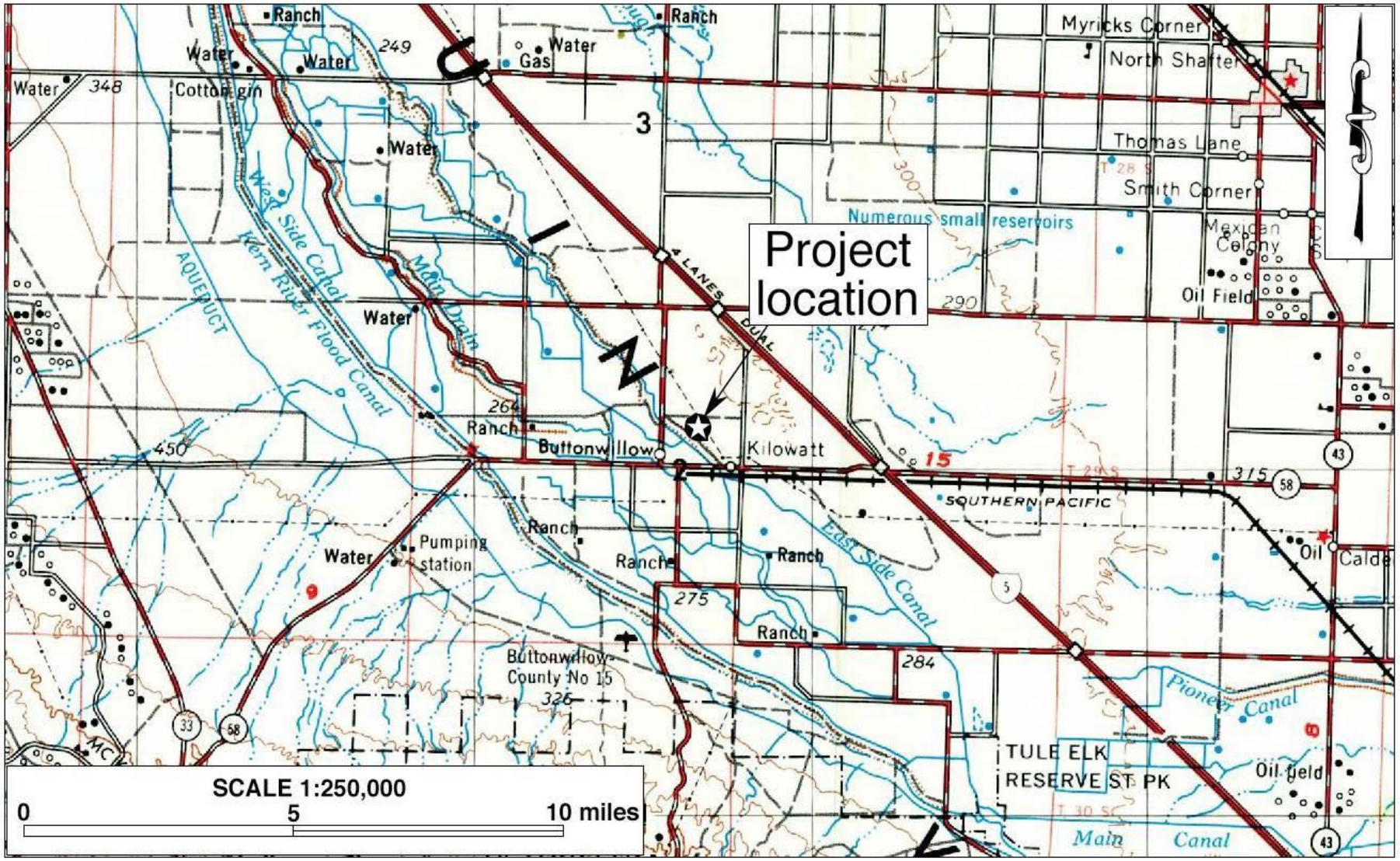


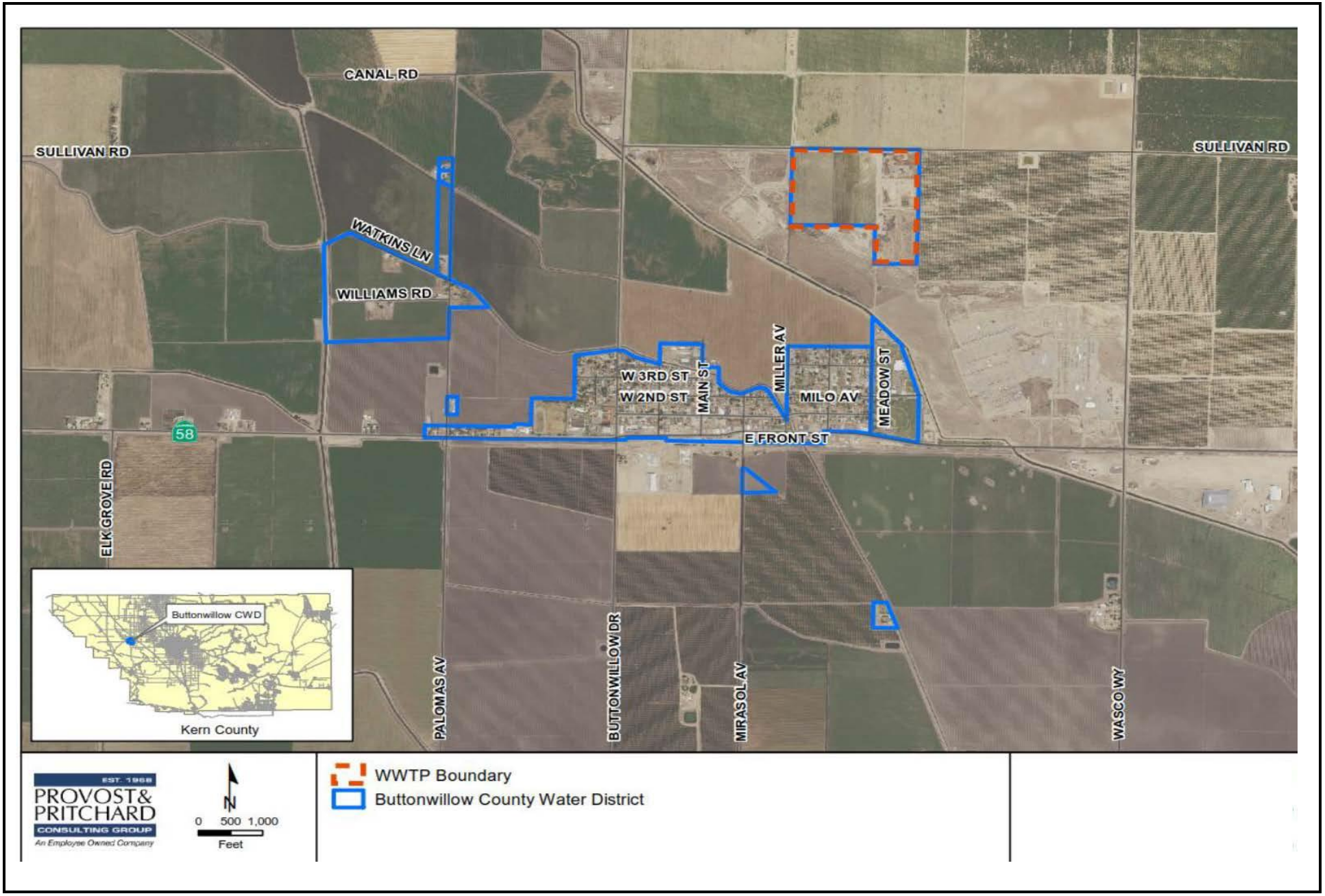
Figure 1. Project vicinity. (Based on USGS Bakersfield, Calif., 30'x60' quadrangle [USGS 1971])

SOURCE: CRM TECH, Identification and Evaluation of Historic Properties for Buttonwillow County Water District, WWTP Improvement Project (October 2019)

FIGURE 1

Tom Dodson & Associates
Environmental Consultants

Project Vicinity



SOURCE: Provost & Pritchard Consulting Group, WWTP Improvement Project (April 2018)

FIGURE 2

Tom Dodson & Associates
Environmental Consultants

Vicinity Map (Aerial Photo)

SOURCE: Provost & Pritchard Consulting Group, WWTP Improvement Project

FIGURE 3

Tom Dodson & Associates
Environmental Consultants

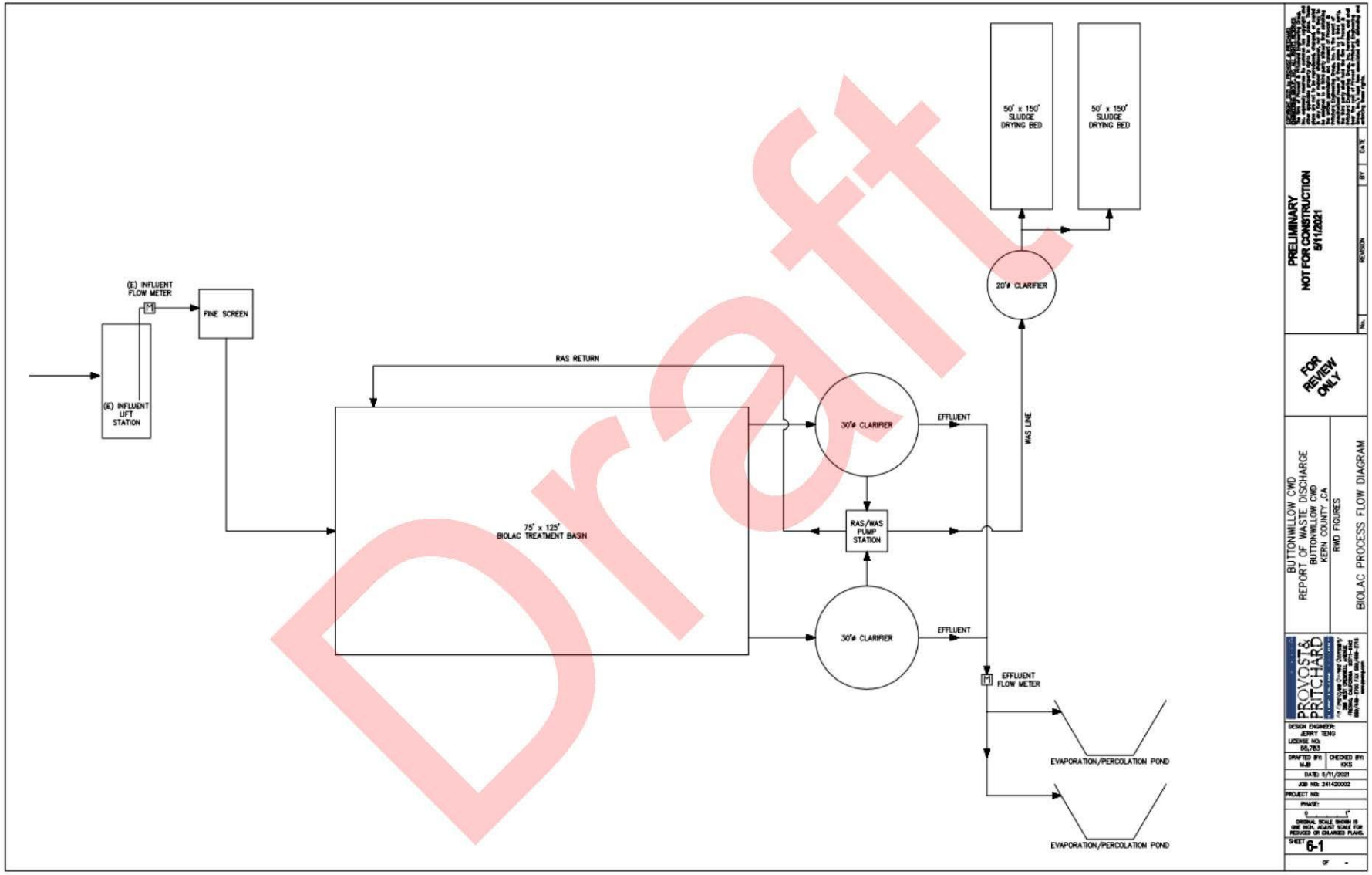
Existing WWTP Site Plan

SOURCE: Provost & Pritchard Consulting Group, WWTP Improvement Project

FIGURE 4

Tom Dodson & Associates
Environmental Consultants

Biolac Preliminary Process Layout



SOURCE: Provost & Pritchard Consulting Group, WWTP Improvement Project – Review Draft (Updated June 7, 2021)

FIGURE 5

Tom Dodson & Associates
Environmental Consultants

Biolac Preliminary Process Flow Diagram

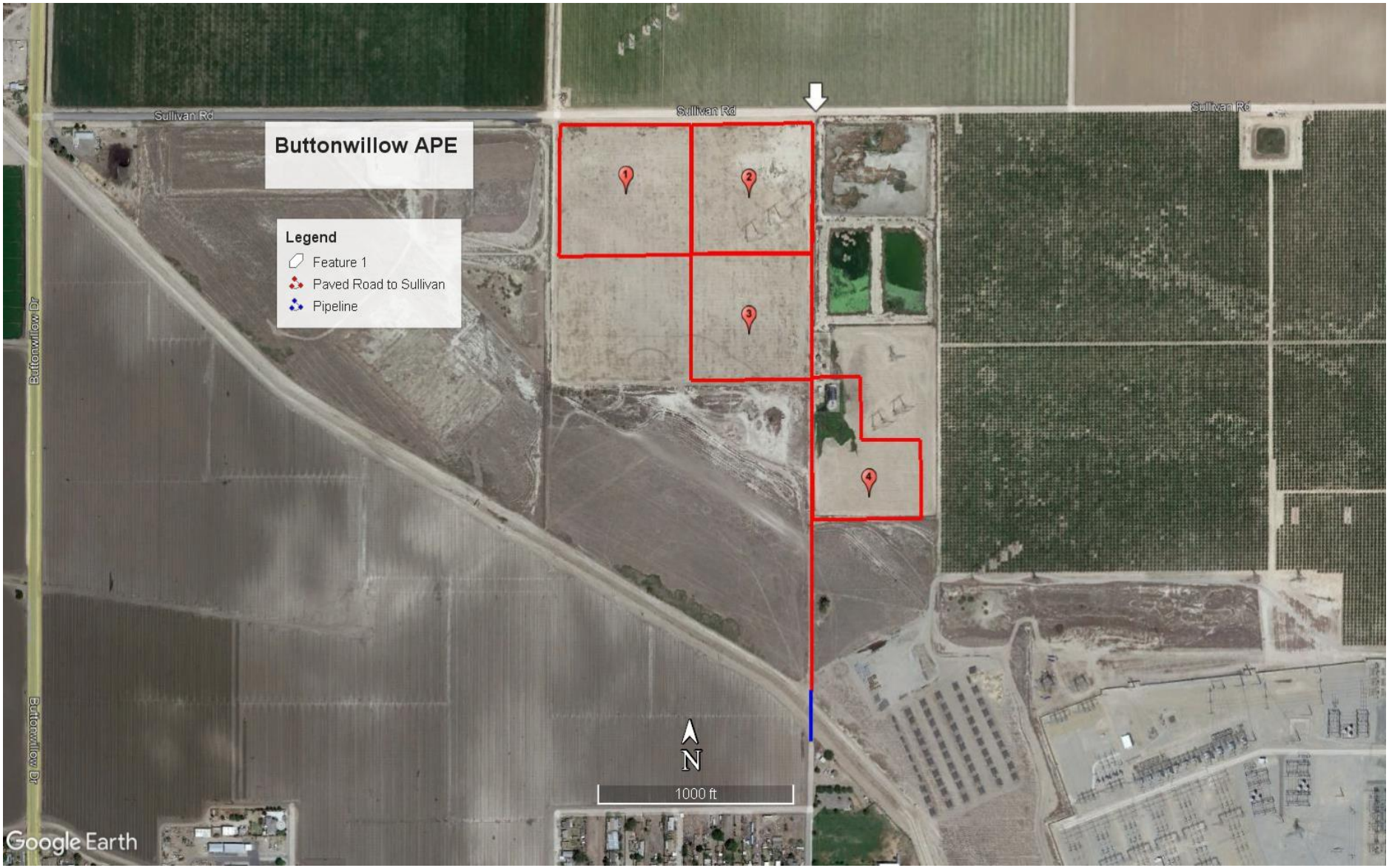


FIGURE 6

Tom Dodson & Associates
Environmental Consultants

Area of Potential Effect

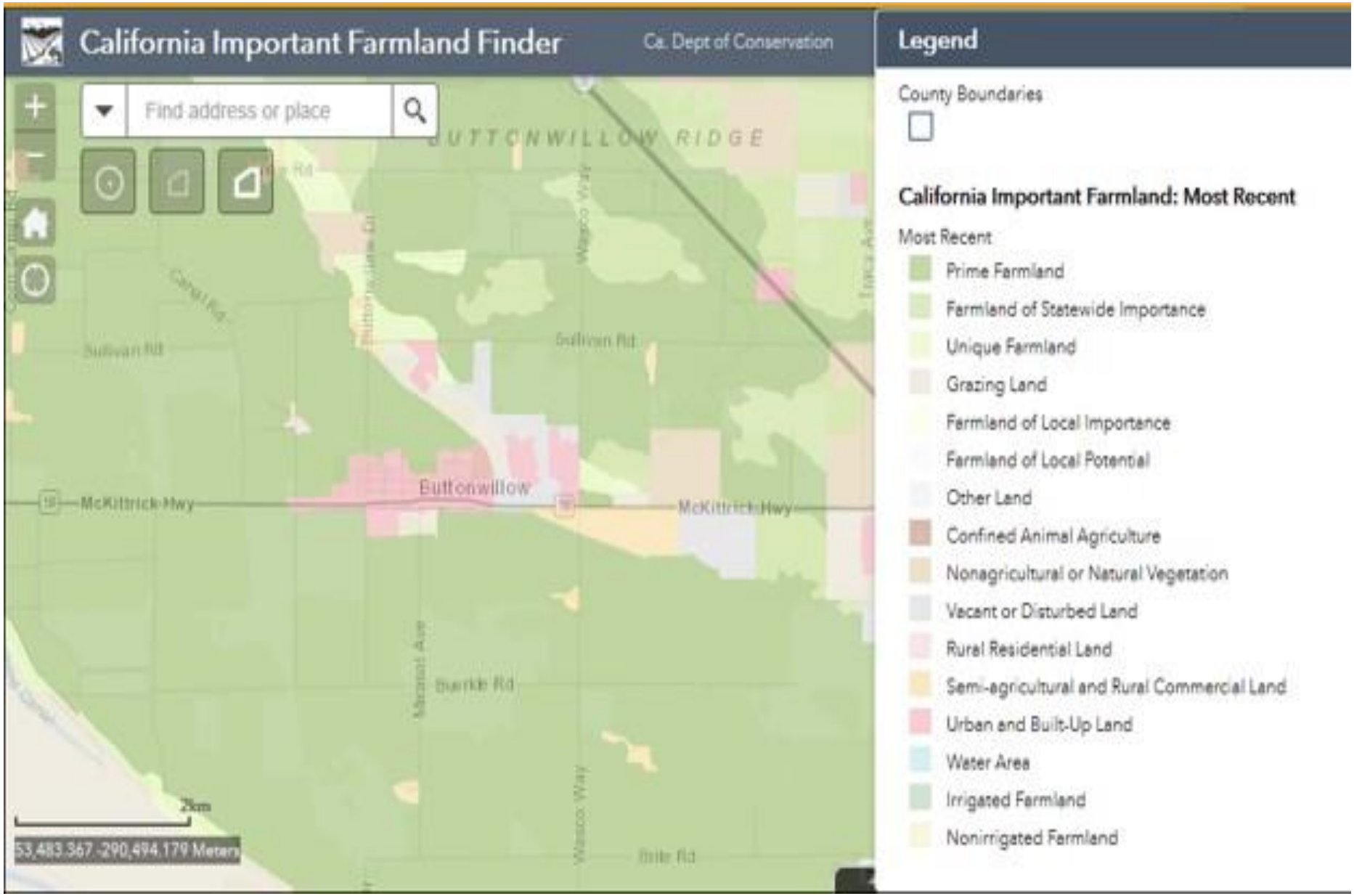


FIGURE 7

Tom Dodson & Associates
Environmental Consultants

Farmland Map

APPENDIX 1

Buttonwillow County Water District

Wastewater Treatment Plant Improvements Project
Clean Water State Revolving Fund Project Report

Review Draft

Buttonwillow, CA
April 25, 2018
Updated: June 7, 2021

Prepared for:
Self Help Enterprises

Prepared by:
Provost & Pritchard Consulting Group

Table of Contents

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Appendices

Abbreviations

ADF	Average Daily Flow
AGR	Agricultural Supply
BOD	Biochemical Oxygen Demand
BCWD	Buttonwillow County Water District
CEQA	California Environmental Quality Act
CV-SALTS	Central Valley Salinity Alternatives for Long-Term Sustainability
CWSRF	Clean Water State Revolving Fund
DO	Dissolved Oxygen
DPMC	Dual Power, Multi-Cellular Pond
EC	Electrical Conductivity
gpd	gallons per day
gpm	gallons per minute
HP	horsepower
MBR	Membrane BioReactor
MG	Million Gallons
MGD	Million Gallons per Day
mg/L	milligrams per liter
MUN	Municipal and Domestic Supply
N	Nitrogen
O&M	Operation and Maintenance
PHF	Peak Hourly Flow
RWQCB	Regional Water Quality Control Board
SBR	Sequencing Batch Reactor
SCADA	Supervisory Control and Data Acquisition
SGMA	Sustainable Groundwater Management Act
SWRCB	State Water Resources Control Board
TN	Total Nitrogen
TSS	Total Suspended Solids
WDR	Waste Discharge Requirements
WWTP	Wastewater Treatment Plant

1 Introduction

1.1 Need for Project

The Buttonwillow County Water District (BCWD) wastewater treatment plant (WWTP) has been operating since 2010 with a membrane bioreactor treatment system. Self Help Enterprises (SHE) has obtained Clean Water State Revolving Fund (CWSRF) funding on behalf of BCWD to prepare a Project Report analyzing alternatives for the WWTP to bring the effluent into compliance with the Waste Discharge Requirements (WDR). SHE directed Provost & Pritchard to proceed with the Project Report for the WWTP alternatives in April 2017.

The WWTP currently operates under a 2009 permit issued by the Central Valley Regional Water Quality Control Board (RWQCB), WDR Order No. R5-2009-0123 (**Appendix A**). The permitted capacity of the existing WWTP is 0.15 million gallons per day (MGD).

The existing WWTP has been plagued with operational issues since the plant was commissioned in 2010. Due to these operational issues, the WWTP has consistently been out of compliance with the WDR limitations. Below is a summary of the issues with the existing WWTP:

1. The plant cannot operate at its design flow rate of 0.15 mgd. This is partially due to the inability of the membranes to handle the design flow rate. Because of this, the operators bypass 50% to 70% of the influent flow to the original Imhoff tank where it receives primary treatment only. On average, the WWTP is treating 0.04 mgd. Flows greater than 0.04 mgd are bypassed to the Imhoff tank.
2. The WWTP has limited capacity to handle peak hour or maximum day flows due to the inadequate size of the existing equalization tanks. To handle these flows, the operators have used the 12-inch gravity line from the Buttonwillow community as storage. This can cause the wastewater stored in the sewer to become septic, emit odors and allow grease to accumulate.
3. The coating on the existing steel tanks is constantly corroding, lasting approximately three years. The cost of re-coating the tanks is approximately $300,000. This is a large expense for the BCWD.
4. There is only one sludge drying bed. This does not allow the bed to be properly maintained since there is nowhere else to store waste sludge when the existing bed is out of service.

5. The membranes can operate for approximately one month before they need to be taken off line and cleaned due to fouling. The cleaning process requires more than 200-man hours each time. Even after thorough cleaning, the membranes remain the limiting factor for treated water through the plant.
6. Most of the motors and pumps are mounted on the inside of the tanks opposite the center walkway. The mixers are mounted on the outside of the equalization tanks. This makes it impossible for the operator to service this equipment from the existing walkway down the middle of the tanks.
7. There are no DO measurement probes in any of the tanks to track and maintain required DO concentrations.
8. There are no level probes or controls in any of the tanks leading to overflows of the tanks without the operator knowing.
9. There are no automatic fine screens ahead of the treatment process. There are basket screens to remove larger debris. The lack of automatic fine screens leads to some settleable solids being carried through the treatment process causing issues with the pumps between the process tanks and contributing to the fouling of the membranes.

According to data submitted to the State as required in the WDR, the effluent that is processed through the membrane treatment process has difficulty consistently meeting WDR limitations. Since the plant can only process 0.04 mgd through the membrane process, much of the influent does not receive adequate treatment since it is bypassed to the Imhoff tank. Thus, most of the effluent discharged to the disposal basins receives little to no secondary treatment.

There are no operations improvements that can address all of the deficiencies listed above. All of the issues require capital improvements to adequately address the problems. These capital improvements are described later in this report as Alternative 4, Modify Existing Treatment Plant.

The District has no formal asset, operation or maintenance management system. Equipment is repaired or replaced as it breaks. Equipment depreciation is not consistently funded by the District. As part of the construction of the new WWTP, the District will have a complete operations and maintenance O&M manual prepared, which will include preventative maintenance schedules and a list of spare parts to be maintained at the WWTP for repairs. The financial analysis presented later in this report includes funding for asset reserves to replace equipment as it reaches the end of its useful life.

The objectives of the proposed improvement project are to provide the necessary treatment upgrades to reliably meet WDRs at a low operations and maintenance cost.

The purpose of this document is to address the necessary design capacity and WWTP performance criteria, and evaluate and develop recommendations related to the treatment process including ongoing operations and maintenance costs. The WWTP physical processes will be designed with an average daily design flow(ADF) rate of 0.15 MGD, which is the existing design flow rate. The design criteria for influent wastewater characteristics, flow and effluent requirements are summarized in Table 1-1.

Table 1-1 Wastewater Characteristics and Treatment Criteria

Criteria	Existing Value (2015-2020)	Proposed Design Value
Wastewater Flow		
Average Daily Flow (ADF)	0.090 MGD	0.12 MGD
Maximum Month (ADF)	0.145 MGD	0.15 MGD
Peak Hourly Flow (Peaking Factor: 3.5)	*	0.42 MGD
Disposal Capacity	0.15 MGD	0.15 MGD
Existing Flow Being Treated	0.04 MGD	
Influent Flow Being Bypassed	0.05 MGD	
Influent Wastewater Characteristics*		
Biochemical Oxygen Demand (BOD_5)	110 - 630 mg/L	340 mg/L
Total Suspended Solids (TSS)	100 - 570 mg/L	320 mg/L
Total Nitrogen (TN)	48 mg/L	50 mg/L
Design Discharge Requirements		
Biochemical Oxygen Demand (BOD_5) (30-day mean/maximum)	40/80 mg/L	30/60 mg/L
Suspended Solids (30-day mean/maximum)	40/80 mg/L	30/60 mg/L
Total Nitrogen	10 mg/L	10 mg/L
EC**	500 + source	500 + source
Effluent pH	6.5-8.3	6.5-9.0
Dissolved Oxygen in Ponds (min.)	1.0 mg/L	1.0 mg/L

* Current WWTP is not capable of handling maximum daily and peak hourly flow.
**Source water EC is very high (approx 1,800 µmhos/cm). The new WDR's are expected to impose an effluent EC limit of 700 or 900 µmhos/cm (depending on the water uses of the groundwater underlying the site – AGR or MUN) per the requirements of the implementation of the CV-SALTS program. Either limit will be extremely difficult for a new WWTP to achieve given the EC of existing source water for the community. Therefore, the District will participate in the Alternative Permitting Approach to Salinity Compliance, which will include participation and funding of a regional Prioritization and Optimization (P&O) study. The District will also continue their existing monitoring and control activities.

2 Project Area

2.1 Location

The BCWD is located approximately 25 miles west of the City of Bakersfield, in rural western Kern County, California. A vicinity map is included as Figure 2-1. Buttonwillow is a predominantly agricultural community with no significant industrial dischargers. The community had a population of 1,508 (435 sewer connections) in the year 2010, according to US Census data. Figure 2-2 shows a map of the service area.

The WWTP is located approximately 0.5 miles north of the Buttonwillow community in Section 13, Township 29 South, Range 23 East, MDB&M on approximately 30 acres of land. An additional 40-acre tract of land, which adjoins the west boundary of the existing property, is owned by the District for disposal of wastewater on non-human consumption agriculture. The 40-acre parcel is leased to a farmer. The WWTP site is bisected by electric transmission lines rendering much of the site unavailable for uses other than farming and ponds.

2.2 Current Land Use and Land Use Trends

The land use around Buttonwillow is primarily agricultural. Most of the land use within the BCWD service area is residential, with some commercial, institutional and limited industrial.

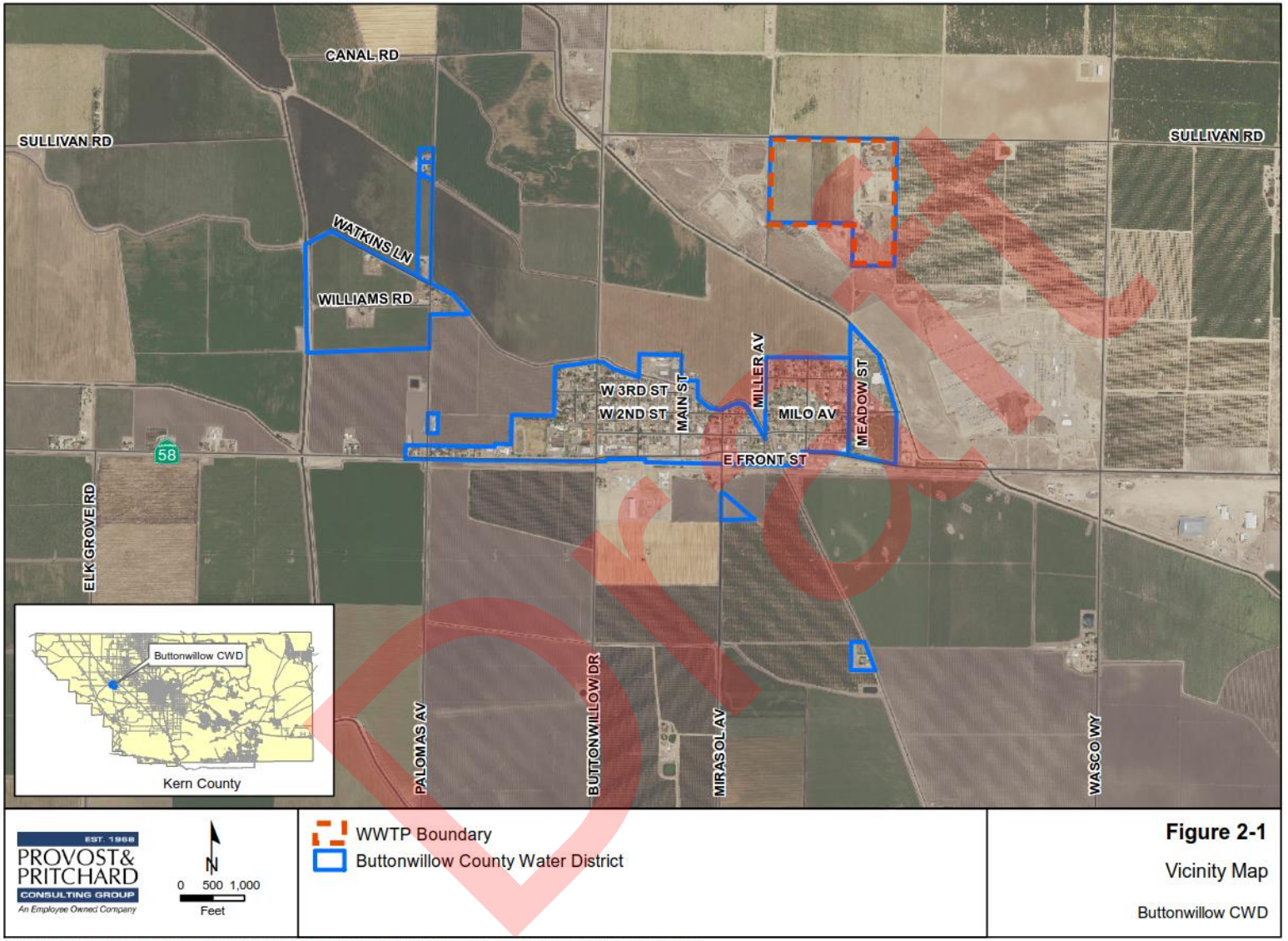


Figure 2-1 Vicinity Map

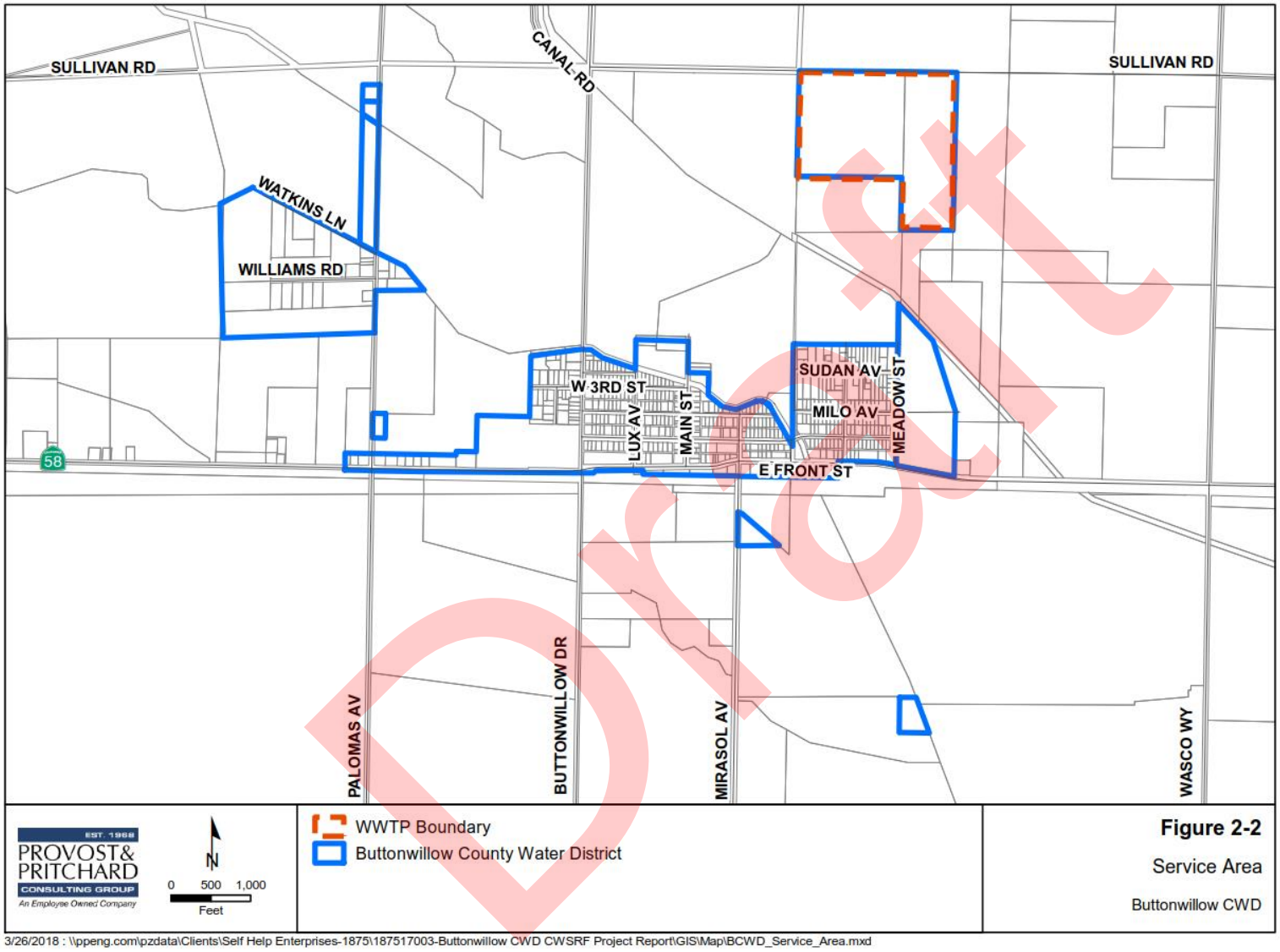


Figure 2-2 Buttonwillow CWD Service Area

2.3 Growth Areas and Population Trends

Census population data for the years 2000 and 2010 indicate the population increased from 1,266 to 1,508. The population growth rate for this period was therefore approximately 1.9% per year. Since that time period, growth in Buttonwillow has been very low.

Based on the State of California, Department of Finance, Report P-1 (Total Population): State and County Population Projections, 2010-2060 (December 2014), the estimated average growth rate for Kern County over the next 20 years is expected to be approximately 1.5% per year.

Based on historic growth rates and the outlook for future growth for Buttonwillow, there is expected to be minimal growth. In addition, the District has completed a water meter installation project and implementation of a rate schedule based on water usage, which has resulted in water conservation. Based on these factors, the wastewater flows are not expected to increase significantly and the permitted capacity of the WWTP would accommodate any growth.

2.4 Sewer Rates

Prior to June 2019, the District's monthly sewer rates were inadequate to financially support the current WWTP (see **Table 2-1**). A rate study was prepared for the District, which recommended significantly higher sewer rates as shown in **Table 2-2**. Additional sewer rate increases have been planned for the next 2 fiscal years, as shown in the table, and will hopefully allow the District to breakeven in approximately 5 years (see projected sewer revenue, expenses, and reserve balance in **Figure 2-3**). These proposed rate adjustments were implemented following a Proposition 218 proceeding. The District's service area is considered a Severely Disadvantaged Community (median household income of $34,352). These low-income customers are significantly impacted by these sewer rates and have expressed concern regarding the proposed increases for the next two years.

The District is currently paying off a 40-year, 2.5% interest rate USDA loan that paid for the WWTP improvements. The outstanding balance is approximately $440,000 with an annual payment of $19,850.

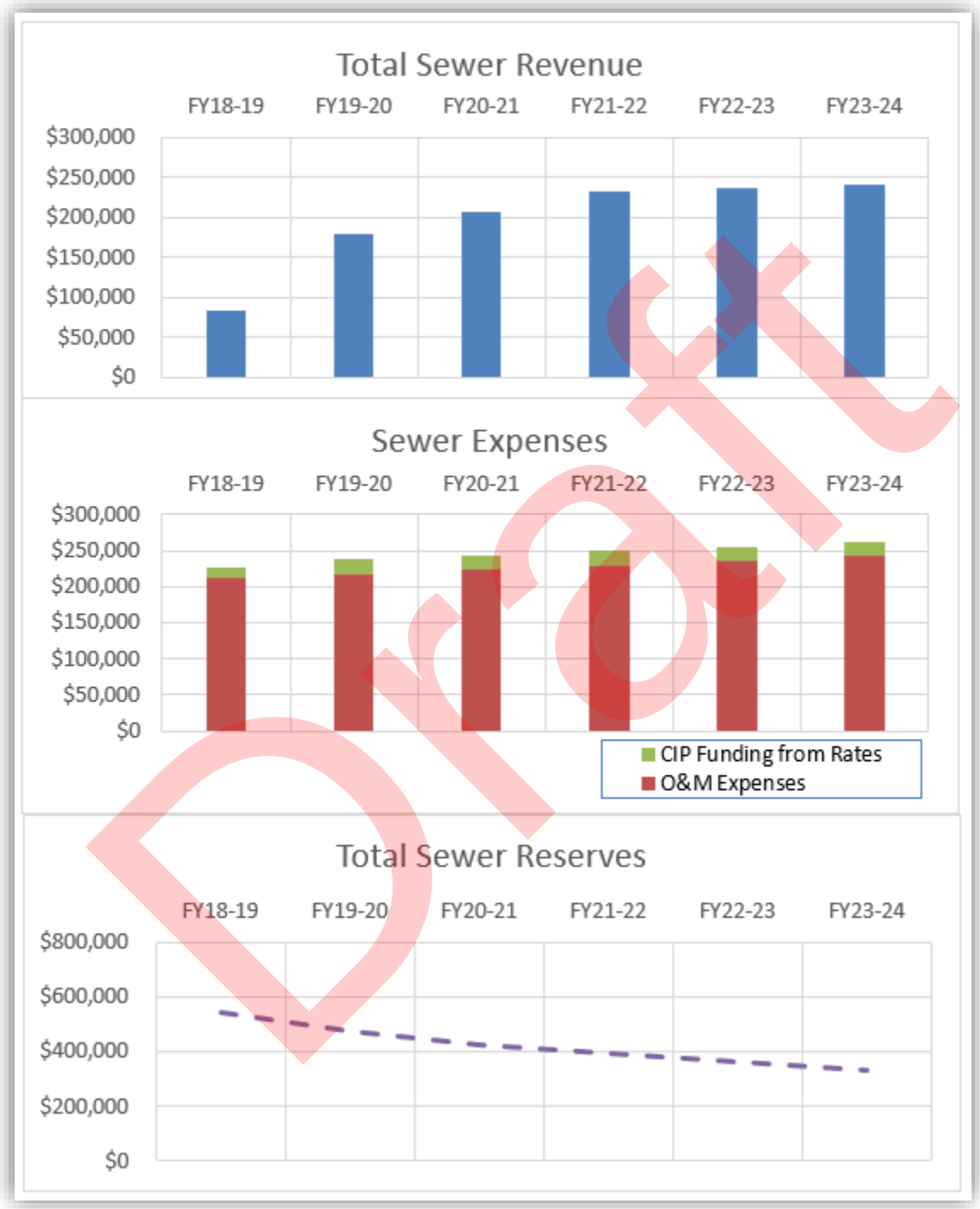
Table 2-1: Prior Monthly Sewer Rates (before June 2019)

Customer Type	Monthly Rate
Residential	$ 11.40
Church/Service Club	$ 10.80
Commercial	$ 11.30
Apartments	$ 37.25
Buttonwillow School	$ 111.90

Table 2-1: New Monthly Sewer Rates (after June 2019)

Customer Type	Multiplier	FY2019-20	FY2020-21	FY2021-22
Single Family Dwelling	1.00	$ 30.00	$ 35.00	$ 40.00
Duplex	1.16	$ 34.80	$ 40.60	$ 46.40
Triplex	1.72	$ 51.60	$ 60.20	$ 68.80
Fourplex	2.29	$ 68.70	$ 80.15	$ 91.60
Apartment (per unit)	0.58	$ 17.40	$ 20.30	$ 23.20
Motel (per room)	0.2	$ 6.00	$ 7.00	$ 8.00
Buttonwillow School	22.60	$ 678.00	$ 791.00	$ 904.00
Medical/Dental Clinic	0.90	$ 27.00	$ 31.50	$ 36.00
Office	0.80	$ 24.00	$ 28.00	$ 32.00
Buena Vista WSD	4.50	$ 135.00	$ 157.50	$ 180.00
Grocery Store	0.80	$ 24.00	$ 28.00	$ 32.00
Restaurant	1.70	$ 51.00	$ 59.50	$ 68.00
Service Station	0.70	$ 21.00	$ 24.50	$ 28.00
Car Wash	3.60	$ 108.00	$ 126.00	$ 144.00
Convenience Store	0.60	$ 18.00	$ 21.00	$ 24.00
Laundromat	4.60	$ 138.00	$ 161.00	$ 184.00
Salon	1.20	$ 36.00	$ 42.00	$ 48.00
Fire Department	2.20	$ 66.00	$ 77.00	$ 88.00
Library/Post Office	0.20	$ 6.00	$ 7.00	$ 8.00
Senior Center	1.00	$ 30.00	$ 35.00	$ 40.00
Church	1.20	$ 36.00	$ 42.00	$ 48.00
Park	1.00	$ 30.00	$ 35.00	$ 40.00

Figure 2-3: Projected Sewer Revenue, Expenses, and Reserve Balance (6 Fiscal Years)



FY: Fiscal Year
CIP: Capital Improvement Program
O&M: Operations and Maintenance

3 Existing Facilities

3.1 Existing Facilities

The existing WWTP site plan is shown in **Figure 3-1**. The existing Buttonwillow WWTP consists of two side by side pre-engineered modular biological treatment systems constructed in 2010. The modular units are constructed of painted steel and sit on a concrete slab and are entirely above grade (**Figure 3-2).** The primary components include an equalization tank, a rotating biological contactor, Bio-wheel (**Figure 3-3**) followed by a flat plate membrane filtration system designed to remove biochemical oxygen demand (BOD) and suspended solids. The system is designed to nitrify/denitrify.

The raw influent is pumped from the influent lift station structure, where it passes through a splitter to divide the flow between the two units, a coarse basket screen before entering an aerated equalization tank. From the equalization tank, the wastewater is pumped with submersible pumps into a mixed anoxic denitrification tank. The denitrification tank wastewater is pumped into the Bio-wheel tank. The effluent from the Bio-wheel tank is pumped into the membrane tank. Solids from the Bio-wheel tank are pumped into a sludge tank. Mixed liquor activated sludge from the tank is either returned to the process (return activated sludge, RAS) or wasted (waste activated sludge, WAS) to the sludge drying bed.

Effluent from the membranes is distributed to one of two unlined recycled water ponds. The recycled water ponds provide for percolation of the effluent into the soil and evaporation to the atmosphere. Effluent from the ponds may also be applied as needed to the 40 acres of pasture lands adjacent to the WWTP, but the District has not used this disposal method in recent years.

At the current flow of 0.091 mgd, effluent entering the ponds percolates and evaporates quickly, leaving little or no water available for irrigation.

The Buttonwillow Sanitary Landfill is located just to the west of the Buttonwillow WWTP. The active landfill operations ceased in 1998 with final closure of the landfill happening in 2010. The landfill has a ground water monitoring network consisting of six groundwater monitoring wells surrounding the landfill. The sample results from the well closest to the WWTP (BT1-01 shown on **Figure 3-1**), ranges from 10 to 34 ppm for nitrates (as N) from 2016 to 2020. These results are above the potable water

nitrate (as N) standard of 10 ppm. The 2020 Annual Monitoring Report for the landfill is included as **Appendix B** .

Figure 3-1 Existing WWTP Site Plan

Figure 3-2 WWTP- Bio-Wheel Membrane Plant

Figure 3-3 Bio-Wheel

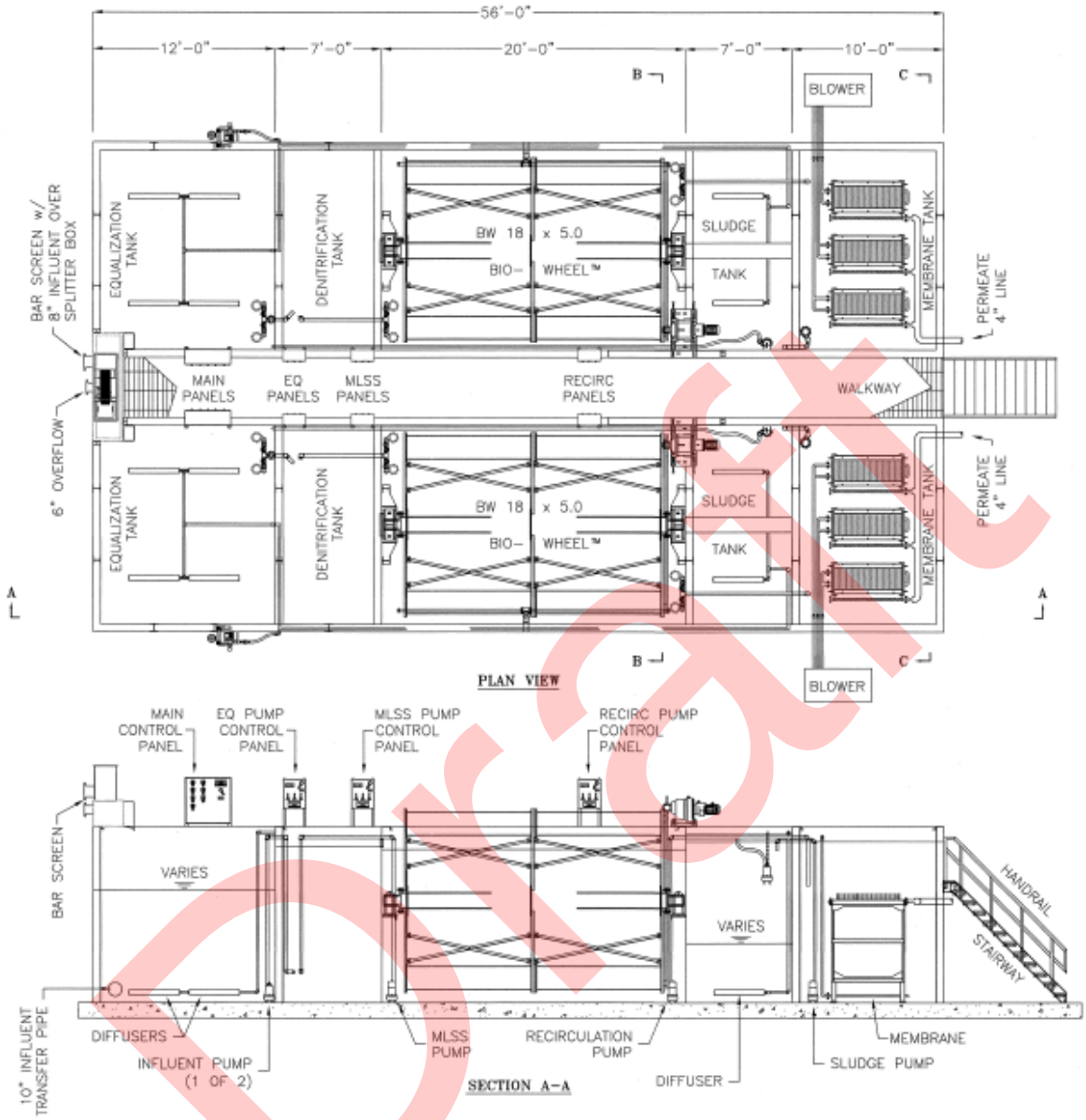


Figure 3-4 Existing Facilities

3.1.1 Influent Pumping and Force Main

Wastewater is collected from throughout the community in a network of gravity sewers which flow into two lift stations (West Side Lift Station and East Side Lift Station). The two lift stations pump wastewater to a 12-inch gravity sewer main, which flows to the influent lift station at the WWTP site. The influent lift station was constructed when the existing treatment system was installed. The lift station is equipped with two 200 gpm submersible pumps. The lead pump alternates at each startup to equally exercise each pump and minimize the number of starts per hour for

each pump. The pumps operate on a constant speed drive. All sewage from the community passes through this lift station, which pumps it up to the WWTP through an 8-inch force main. The District has stated the pumps, piping and controls need to be replaced and the wet well repaired and recoated.

Influent flow is measured at the WWTP by two magnetic flow meters (one on the discharge of each of the influent lift station pumps). The influent then discharges through basket strainers and then enters the treatment system equalization tanks. There is also a valve on the lift station force main (downstream of the meter station) that allows the wastewater to be diverted to the old Imhoff tank. The operator manually sets the position of the bypass valve to the Imhoff tank.

3.1.2 Effluent Disposal

Effluent disposal occurs in two unlined, earthen, rectangular evaporation and percolation ponds. Each pond is 460 feet by 260 feet (2.75 acres) with a maximum water depth of nine feet. Effluent from the ponds can be pumped to the adjacent reclamation area for crop irrigation, as needed. The storage capacity is approximately 42 acre-feet or about 70 days of storage at the proposed design capacity.

Effluent reclamation for agricultural irrigation was planned at part of the effluent disposal plan but has not been used recently as the ponds evaporate and percolate all of the effluent produced by the WWTP.

Assuming the WWTP produces 0.15 mgd, there is 168 acre-ft of effluent produced annually. The pan evaporation rate is 60-inches per year. The 5.5-acres of ponds has the evaporative capacity of 27.5 acre-feet. The ponds are unlined, and it is assumed the percolation rate is 0.2 inches/hr. The yearly potential percolation rate would be 146 feet per year (803 acre-feet per year at 5.5 acres). This means that all the current effluent is either evaporated or percolated. This matches the observation that the ponds are normally dry year-round.

Continued discharge to unlined ponds will potentially degrade the groundwater in the area for nitrates. Lining the ponds and agronomic application of the effluent nitrogen will greatly reduce any potential nitrate degradation of the groundwater.

3.1.3 Solids Handling

There is a single, concrete-lined sludge drying bed that is 40 feet by 20 feet. When the sludge is dried, it is hauled off site for disposal. The single bed does not provide the

District the ability to dry the sludge in the existing bed while another bed is being filled. Therefore, additional sludge drying beds are needed. The existing, single bed is adequately sized for the percentage of the flow treated by the existing plant but must be kept in constant use.

3.2 Sources of Wastewater

Wastewater that is treated at the WWTP is from the community of Buttonwillow, and consists primarily of residential flows, with some commercial uses. There is no industrial flow treated at the WWTP.

3.3 Discharge Violations

The BCWD WWTP has numerous exceedances of its Discharge order for TSS, Total Nitrogen, and EC. There are no current enforcement actions and no Notice of Violations have been issued since 2009, before the existing WWTP began operation.

3.4 Process Performance and WWTP Condition

The existing WWTP has been plagued with operational issues since the plant was commissioned in 2010. Due to these operational issues, the WWTP has consistently been out of compliance with the WDR limitations. Below is a summary of the issues with the existing WWTP:

1. The plant cannot operate at its design flow rate of 0.15 mgd. This is partially due to the inability of the membranes to handle the design flow rate. Because of this, the operators bypass 50% to 70% of the influent flow to the original Imhoff tank where it receives primary treatment only. On average, the WWTP is treating 0.04 mgd. Flows greater than 0.04 mgd are bypassed to the Imhoff tank.
2. The WWTP has limited capacity to handle peak hour or maximum day flows due to the inadequate size of the existing equalization tanks. To handle these flows, the operators have used the 12-inch gravity line from the Buttonwillow community as storage. This can cause the wastewater stored in the sewer to become septic, emit odors and allow grease to accumulate.
3. The coating on the existing steel tanks is constantly corroding, lasting approximately three years. The cost of re-coating the tanks is approximately $300,000. This is a large expense for the BCWD.

4. There is only one sludge drying bed. This does not allow the bed to be properly maintained since there is nowhere else to store waste sludge when the existing bed is out of service.
5. The membranes can operate for approximately one month before they need to be taken off line and cleaned due to fouling. The cleaning process requires more than 200-man hours each time. Even after thorough cleaning, the membranes remain the limiting factor for treated water through the plant. In addition, frequent replacement of membranes is required.
6. Most of the motors and pumps are mounted on the inside of the tanks opposite the center walkway. The mixers are mounted on the outside of the equalization tanks. This makes it impossible for the operator to service this equipment from the existing walkway down the middle of the tanks.
7. There are no DO measurement probes in any of the tanks to track and maintain required DO concentrations.
8. There are no level probes or controls in any of the tanks leading to overflows of the tanks without the operator knowing.
9. There are no automatic fine screens ahead of the treatment process. There are basket screens to remove larger debris. The lack of automatic fine screens leads to some settleable solids being carried through the treatment process causing issues with the pumps between the process tanks and contributing to the fouling of the membranes.

According to data submitted to the State as required in the WDR, the effluent that is processed through the membrane treatment process has difficulty consistently meeting WDR limitations. Since the plant can only process 0.04 mgd through the membrane process, much of the influent does not receive adequate treatment in accordance with the WDR since it is bypassed to the Imhoff tank. Thus, most of the effluent discharged to the disposal ponds receive little to no secondary treatment.

3.5 WWTP Influent and Effluent

3.5.1 WWTP Flow

The current WWTP is not capable of treating the entire influent flow. **Figure 3-5** shows the 2016-2020 monthly average daily flow to the WWTP. The monthly average flow being treated by the existing biowheel-membrane plant during 2016 – 2018 are also plotted. The difference between the total influent flow and treated effluent flow is the volume of influent flow that is being bypassed to the Imhoff tank. For the last seven months of 2017, the influent flow meters were not functioning correctly.

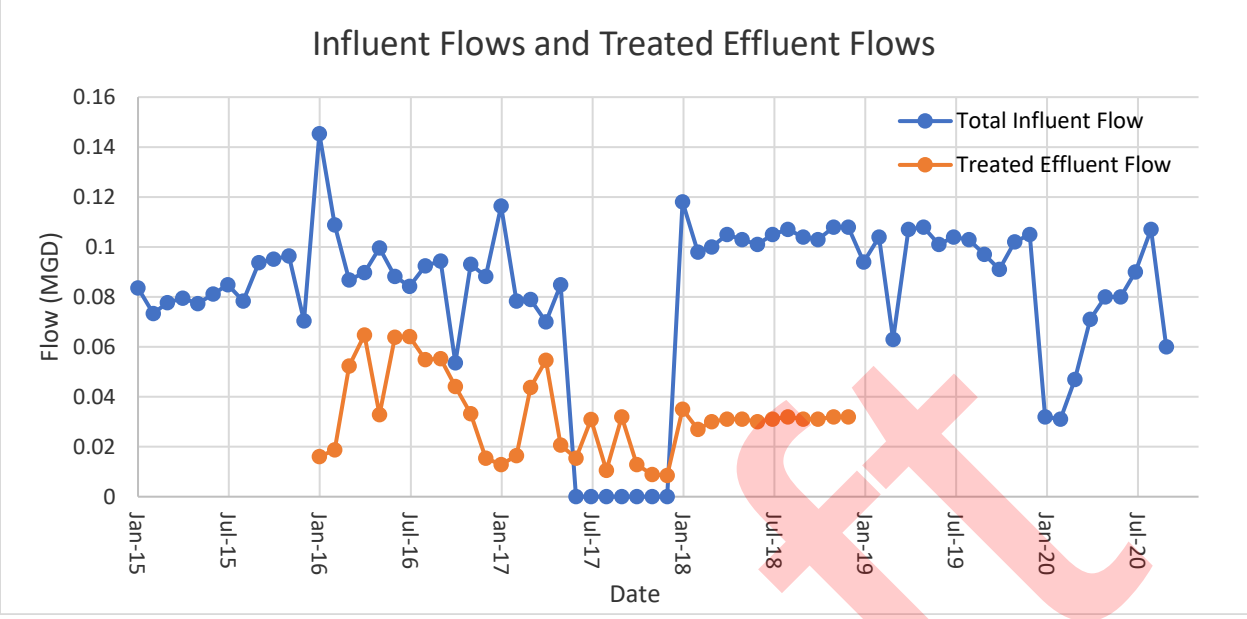


Figure 3-5 Influent and Treated Effluent Flows

Table 3-3 presents the existing and proposed average dry weather flow, peak wet weather flow and the wet weather flow per capita assuming a population of 1,454 based on the 2020 census. Note that the Peak Day Wet Weather flow data are from partial records from 2015 only, may not represent the actual flow situation.

Table 3-3 Flow Data Summary (MGD)

	Existing – Average	Proposed
Average-Dry Weather - mgd	0.091	0.12
Average-Wet Weather - mgd	0.089	0.12
Maximum Month Average -mgd	0.145	0.15
Peak Day-Wet Weather - mgd	0.17	0.42
Wet Weather per Capita - gpcd	117	289

3.5.2 WWTP Influent and Effluent Characteristics

Influent flows to the WWTP are primarily from residential uses, with some commercial and institutional connections. Influent flow characteristics are summarized in **Table 3-1**. The design criteria for the existing Biowheel Membrane Plant WWTP utilized influent BOD and TSS concentrations of 250 mg/L. A review of influent data, shows that the 90th percentile BOD is 342 mg/L and the TSS is 320 mg/L. Thus, the proposed design criteria of 340 mg/L for BOD and 320 mg/L for TSS appears to be adequate.

Table 3-1 2015-2020 Influent Quality Data

Analyte	Units	Average	Maximum	Minimum	Standard Deviation	90th Percentile
BOD	mg/L	227.7	970	92.00	122.40	342.00
TSS	mg/L	158.0	1,030	0.01	157.84	320.00
pH	S.U.	7.45	7.80	6.90	0.17	7.61
TN as N*	mg/L	45	70	35	*	*

*There is no total nitrogen test available. A typical value for domestic wastewater is assumed.

The existing WWTP is designed to provide tertiary treated effluent; however, nitrification and denitrification is only taking place on a fraction of the flow. Current compliance samples are taken at the effluent of the membrane treatment system. The bypassed flow through the Imhoff tank is not monitored. Even so, the effluent from the membrane treatment system does not meet the WDRs limitations on BOD, TSS and TN on a consistent basis.

A summary of the 2015-2020 influent BOD and TSS and treated water (through the Biowheel Membrane Plant) BOD and TSS is shown in **Figure 3-6Error! Reference source not found.** and summarized in **Table 3-2.** The data from the WWTP is somewhat inconsistent and there appears to be some invalid data points. It is recommended that sampling program and equipment be evaluated to determine if the effluent sample is providing correct results.

In recent years, the effluent quality from the treatment process continues to deteriorate. Both BOD and TSS levels fluctuated considerably and are frequently above the WDR limit of 40 mg/L (30-day mean) during 2019 - 2020. The average effluent BOD and TSS was 142 and 69 mg/L.

Total nitrogen levels fluctuate considerably and are continuously above the WDR limit of 10 mg/L (30-day mean). The average effluent total nitrogen from January 2019 through September 2020 was 48 mg/L.

Effluent EC levels are high, primarily because the source water EC ranges up to 1,680 µmhos/cm. Effluent EC levels averaged approximately 1,185 µmhos/cm.

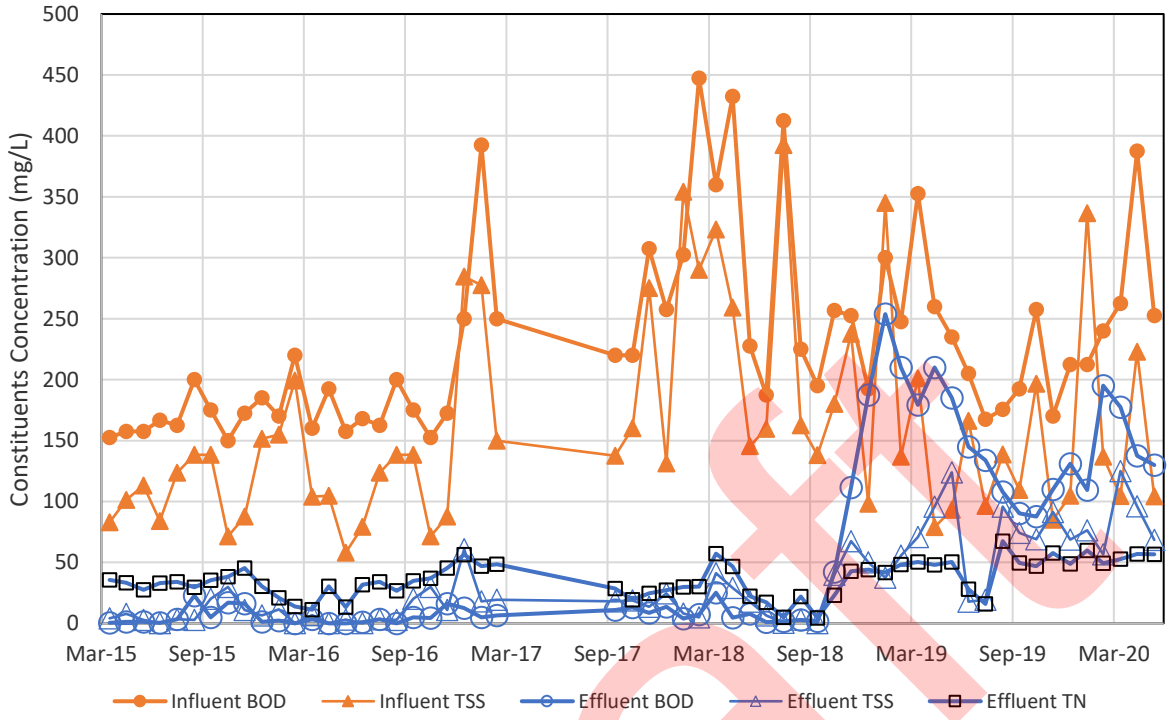


Figure 3-6 Influent/Effluent BOD and TSS in 2015 – 2020

Table 3-2 2015-2020 Membrane Treatment System Effluent Quality Data

Analyte	Units	AVG	AVG (2019~20)	MAX	STD DEV	90th Percentile
BOD	mg/L	59.4	149	405	78.9	180.0
TSS	mg/L	34.6	69	290	42.5	86.0
pH	S.U.	7.30	7.30	7.80	0.16	7.50
EC	umhos/cm	1,185	1,140	2,260	321	1,710
TN	mg/L	36.8	48	120	18.62	55

4 Project Alternatives Analysis

Based on the existing facility and performance of the Buttonwillow WWTP, the proposed project will apply for a new WDRs with a selected treatment process. Four (4) treatment processes (DPMC Aeration Pond, Sequencing Batch Reactor (SBR), Biolac, and Improve Existing WWTP) have been evaluated to fulfill the needs for the project as discussed in previous sections. In addition to treatment process alternatives, there are several project components that will be necessary regardless of the selected treatment alternative. The improvements common to all alternatives are also discussed in this section.

The Interstate 5 Utility Company operates a 0.19 mgd wastewater treatment plant approximately three miles east of Buttonwillow along Interstate 5 and Highway 58. The Interstate 5 wastewater treatment plant does not have the capacity to handle an additional 0.15 mgd from the community of Buttonwillow. Because of this, consolidation or regionalization was not considered as an alternative.

4.1 Waste Discharge Requirements

The current WDRs were issued in 2009, and new WDRs to be issued with the proposed project are expected to have similar effluent limits and testing requirements. The new WDRs should be based on a design flow of 0.15 MGD.

BOD limits in the current WDRs include a 30-day mean of 40 mg/L and a maximum of 80 mg/L. It is expected that the BOD in the new WDRs will include a 30-day mean of 30 mg/L and a maximum of 60 mg/L.

If agricultural irrigation re-use is utilized and the selected process is a pond system, the District will request that there be no limit on TSS. Under agricultural irrigation re-use alternatives, it is proposed the effluent Total N limitation be controlled based on agronomic application of nitrogen for the selected crop. To continue the current percolation disposal methods, the treatment process selected will need to meet the effluent Total Nitrogen limitation requirements from the new General Order that is currently under development by Regional Board for the WWTP of this size.

Current pH limits are 6 to 8.3 and are proposed to be changed to 6.0 to 9.0. The upper limit has been proposed to be increased to allow natural changes in pH due to algal photosynthesis, which may diurnally increase pH above 8.3.

The new WDR's will be expected to impose an effluent EC limit of 700 or 900 µmhos/cm (depending on the water uses of the groundwater underlying the site – AGR or MUN) per the requirements of the implementation of the CV-SALTS

program. Either limit will be extremely difficult for a new WWTP to achieve given the EC of existing source water for the community. Therefore, the District will participate in the Alternative Permitting Approach to Salinity Compliance, which will include participation and funding of a regional Prioritization and Optimization (P&O) study. BCWD will also continue their existing monitoring and control activities.

Table 4-1 WDR Limits on Effluent Quality

	30 Day/Monthly Avg.	Daily Max
BOD_5 (mg/L)	30	60
Total Suspended Solids (mg/L)	30	60
Settleable Solids (mL-hr)	0.1	0.1
Total Coliform (MPN/100L)	N/A	N/A
Nitrogen (mg/L)	10	
12 Month Rolling Average EC, (umhos/cm)	500 + Source Water	

4.2 Design Criteria

Design criteria for the proposed WWTP improvements are presented in Table 4-2.

Table 4-2 Basic Criteria of Design

Location/ Process	Unit	**Value**	
Elevation	ft	**277**	
Influent BOD	mg/L	**340**	
Influent TSS	mg/L	**320**	
Influent Total Nitrogen	mg/L	**50**	
Minimum water temperature	deg F	**50**	
Maximum water temperature	deg F	**80**	
Max month Average daily flow	mgd	**0.15**	
	gpm	**104**	
Maximum Day (Peaking Factor = 1.3 x ADF)	mgd	**0.195**	
Peak Hourly Flow (Peaking Factor = 2.7 x ADF)	gpm	**280**	
Minimum hourly flow	gpm	**69**	
Disposal capacity	mgd	**0.15**	
Secondary effluent		**Mean**	**Maximum**
BOD_5	mg/L	**30**	**60**
Solids, Total Suspended (TSS)	mg/L	**30***	**60***
Total Nitrogen (TN)	mg/L	**<10***	

*May depend on treatment alternative

4.3 No Project Alternative

The no project alternative would provide no improvements to the existing WWTP. The WWTP would continue to bypass flows to the old Imhoff tank and discharge primary treated wastewater to the unlined storage ponds, where it percolates into the ground. Percolation rates are high enough that the effluent does not accumulate in the ponds for irrigation on adjacent crop land at agronomic rates. The WWTP would continue to be in violation of the WDR for the WWTP, and the District could be subject to fines and legal action.

The District's intent is to bring the WWTP into compliance with the adopted WDR and to provide adequate wastewater treatment and disposal facilities to protect the community and the groundwater underlying the site. As such, the No Project alternative is deemed unacceptable to the District and dropped from further consideration.

4.4 Improvements Common to All Alternatives

4.4.1 Influent Lift Station

The District has evaluated the existing influent lift station and determined that the pumps, piping and valves, flow meter, and electrical and controls need to be replaced. The existing wet well will require some concrete repair and the inside coated to resist deterioration of the concrete caused by hydrogen sulfide. The pumps will be equipped with variable speed drives to equalize flow through the WWTP. The lift station controls will be integrated into the WWTP Supervisory Control and Data Acquisition (SCADA) system.

4.4.2 Headworks Screening

A new automated, headworks screen will be constructed to aid in removal of non-biodegradable material. A new automatically cleaned screen and a bypass channel with a manual bar screen will be installed. Aerated pond systems can function with ½ -inch coarse screens. For other treatment processes, fine screens would be needed to aid in the automatic removal of coagulated grease prior to treatment.

4.4.3 SCADA System

The existing WWTP does not have a SCADA system. It is recommended that SCADA be included with any WWTP upgrades to provide alarm capabilities as well as providing automatic data logging of critical information. The SCADA system for an

aerated pond system would be minimal since it would mainly be used to control the run times of the aerators. A full SCADA system would be needed for other alternatives as they involve more complex WWTP functions that require monitoring.

Installation of a SCADA system does not relieve the operator of the need to visit the WWTP daily. It would, however, allow the operator to receive alarm indications when away from the WWTP, which could improve response time when problems arise.

In addition to SCADA at the WWTP, it is recommended that an alarm system be installed at the two lift stations within the sewer collection system. The alarm dialer system will notify the operators of high water levels, loss of power and pump failures, so these problems can be dealt with as soon as they occur.

4.4.4 Solids Handling

Solids handling facilities would not be required for the Aeration Pond alternative. However, for the other three alternatives considered, solids handling will be necessary. For the pond system alternative, biosolids may be dredged and removed as necessary, likely after six to ten years of use, or more depending on influent loading. The removed sludge could be piled up and dried in the existing sludge drying area or mechanically dewatered with a portable dewatering press then hauled offsite.

For the alternatives that include nitrification and denitrification (required to meet WDR discharge limitations), sludge needs to be wasted periodically from the treatment process. Two or more sludge drying beds should be installed to allow one drying bed to be serviced and sludge dried while the second one is being filled. Considering the proposed increased design flow and process changes, two new, larger sludge drying beds should be constructed.

4.4.5 Electrical Facilities

The existing electrical facilities are likely insufficient for the proposed WWTP improvements. The current supply voltage is 240 volts AC. A 480-volt, 3 phase electric service will be required for all alternatives. It is recommended that the electrical facilities be upgraded or replaced with the proposed project. A new emergency power generator will be installed for all alternatives.

Where possible, electrically operated equipment will be located away from the existing high voltage power lines over the site and be sheltered from sun and weather. Controls and instrumentation plus any VFDs (variable frequency drives) should be enclosed in a climate-controlled structure.

4.4.6 Supply Water

The WWTP does not currently have a potable water supply or any means of providing water for wash down of the facilities. Installation of a potable water service is recommended for the new WWTP to provide washdown and house keeping water, drinking water and a restroom. Providing service from the District's potable water system would require installation of approximately ½ mile of a 4-inch PVC pipeline from the community to the WWTP.

The potable system will require a backflow preventer. A water connection will be necessary for rinsing of the proposed automatically cleaned screen at the headworks. Hose bibs would be provided near the headworks and treatment facilities for wash down.

4.4.7 Buildings

A pre-engineered modular building (20' by 50') equipped with power, internet connection and an HVAC system will be provided. The building will include office space, laboratory counter space, sink for sampling activities, and an ADA accessible restroom. The building may also house the motor control center and electrical gear.

Alternatives requiring aeration blowers will include an open-sided shelter with a concrete slab providing some protection against rain and sun. Size of the shelter will vary between alternatives due to the number and size of the blowers.

4.4.8 Access Road and Fences

The access road to the WWTP off Sullivan Rd is currently an unmaintained dirt road. During the wet season, the road is undrivable. At minimum, a single lane 16-ft wide paved access road (aggregate base) to the WWTP entrance will be included to provide year-round vehicle access and proper road drainage. The total length of the road is approximately 1,800 feet.

The WWTP area including the treatment ponds, percolation ponds, emergency storage ponds and stormwater ponds and solar panels will enclosed with chainlink fences. For effluent reclamation alternative, the area used for effluent irrigation will also be fenced.

4.5 Treatment Process Alternatives

Four biological treatment processes have been evaluated, including: (1) Dual Power Multi-Cell Aeration Pond System (DPMC), (2) Extended Aeration Activated Sludge System (Biolac), (3) Sequencing Batch Reactor (SBR), and (4) improving the existing Bio-wheel Membrane Bioreactor Plant (MBR) treatment plant.

It has been assumed that nitrogen removal will be a controlling factor in treatment process selection. If the current WDRs are retained with a Total N effluent limit of 10 mg/L to achieve the goals of the State's Nitrate Control Program, the selected process must be capable of consistent, predictable nitrogen removal. This would require an activated sludge system such as the Biolac, SBR or an upgrade of the bio-wheel MBR. Pond systems provide secondary treatment with limited nitrogen removal. Control of the oxygen addition to the aeration ponds and recycling effluent may allow some nitrogen removal; however, it may not be effective on a consistent basis. Low temperature may adversely affect performance. However, if agronomic application of nitrogen is allowed by the WDRs, a pond system can be considered.

The MBR system is the only system that is potentially capable of providing the equivalent of Title 22 tertiary disinfected effluent that requires a filtration and a disinfection step. With the addition of disinfection by chlorine or UV light, the effluent could be used for unrestricted irrigation of crops and parks, landscaping etc. The Biolac and SBR processes provide the equivalent of secondary treatment with nutrient removal. The effluent from these alternatives can best be used for irrigation of non-food crops or percolation at the basins. Because there is no identified economical use of Title 22 filtered, disinfected effluent, there is no advantage to the MBR system over other treatment processes that produce secondary effluent.

4.5.1 Alternative 1 – DPMC Aeration Pond System

This alternative is an aeration pond system that consists of a lined pond with storage in the existing disposal ponds. The recommended aeration process is the dual-power, multicellular (DPMC) aerated pond system. The DPMC system consists of three cells in series. The three cells will be in a single lined pond with baffles used to divide the pond into cells. The hydraulic retention time of the entire system is approximately fourteen (14) days with a pond water depth of nine feet. The first cell of the DPMC process is aerated at a level that will maintain all solids in suspension and provide oxygen sufficient for the conversion of the influent BOD to carbon dioxide and biomass. The following two cells serve the functions of sedimentation, solids stabilization, and sludge storage. These three cells are aerated at lower levels compared to the first cell. The three cells are aerated at a level that permits the

settleable solids to settle, but, is sufficient to maintain an aerobic layer at the top of the solids deposited. The aerobic layer reduces feedback of nitrogen and BOD to the water column and maintains a stable solids layer.

The process multi-celled pond is approximately 310 ft x 130 ft (2.15 MG). The first cell would be aerated by three (3) - 5 HP surface aerators. The second cell would be equipped with two (2) - 5 HP surface aerators. The third cell would be equipped with two (2) - 3 HP surface aerators. The third cell would be equipped with a pump to recirculate a portion of the wastewater and settled solids back to the head of the pond.

The new treatment facilities can be constructed while the existing WWTP remains entirely in service.

Controls for the facilities are simple and based on a timed operation of the aerators. There is no regular sludge removal as is required by activated sludge systems. The influent and effluent monitoring requirements will be similar to the current requirements. The addition of more surface aerators requires more mechanical maintenance.

This alternative is not able to treat the effluent to below 10 mg/L of nitrate. However, the two-existing recycled effluent storage ponds could be lined and used for treated effluent storage. The treated effluent could then be land-applied to crops (such as alfalfa) at an agronomic rate that will utilize the nitrogen. Due to the relatively small volume of wastewater generated from the treatment plant, any farmer utilizing the wastewater may find it uneconomical to continuously grow the crops needed to provide the required nitrogen uptakes that are needed to meet potential WDR requirements. This is due in part to the large amount of supplemental irrigation water that would be required in addition to the wastewater effluent to keep the crop viable throughout the year. There may be additional costs associated with the wastewater disposal to assure that the land application area is continuously and properly operated by the farmer.

4.5.2 Alternative 2 – Biolac Extended Aeration Activated Sludge System

This alternative is an extended aeration activated sludge system that consists of activated sludge facilities with nitrification/ denitrification, clarification, and disposal to existing oxidation pond. The Biolac system (or approved equal, such as Bioworks wastewater treatment system) incorporates a concrete-lined basin and moving aeration chains and diffusers within the basin. The aeration header pipes float at the water surface and the aeration diffuser grids sit near the bottom of the ponds. Positive-displacement blowers would be installed in a blower building to supply the air to the

aeration manifold. The Biolac system is designed for nitrogen removal. The system is very energy efficient because of the small volume (low hydraulic retention time of 24 to 48 hours) and efficient mixing by the moving aeration chains.

The mixed liquor from the aeration basin would flow by gravity to two circular concrete clarifiers. Biomass would be separated from the mixed liquor in the clarifiers. A return activated sludge/waste activated sludge (RAS/WAS) pump station will be required. The RAS/WAS pump station will be located at or near grade allowing for easy operator access to the pumps for maintenance. Settled biomass would be collected in the bottom of the clarifier and pumped to the influent zone of the activated sludge basin. Biomass would be wasted periodically to an aerobic sludge digester to be further stabilized before being applied to drying beds. Effluent disposal could continue to be done via the evaporation/percolation in the existing ponds.

4.5.3 Alternative 3 – Sequencing Batch Reactor (SBR)

SBRs are a variation of the activated-sludge process. SBRs combine all the treatment steps and processes into a single basin, or tank, whereas conventional facilities rely on multiple basins. The operation of an SBR is based on a fill-and-draw principle, which consists of five steps – fill, react, settle, decant, and idle. In contrast, all other processes considered are continuous flow using multiple basins and structures. SBRs can be designed for nitrogen removal.

During the fill phase, the basin receives influent wastewater. During the fill, aerators will be activated. The contents of the basin are aerated to convert the anoxic zones over to an aerobic zone. No adjustments to the aerated-fill cycle are needed to reduce organics and achieve nitrification. To achieve denitrification, it is necessary to switch the aeration off and mix only to promote anoxic conditions for denitrification.

The react phase allows for further reduction of wastewater parameters. During this phase, no wastewater enters the basin and mixing and aeration units are on. Because there are no additional volume and organic loadings, the rate of organic removal increases dramatically.

During the settle phase, activated sludge can settle under quiescent conditions – no flow enters the basin and no aeration and mixing takes place. When one basin is in the settle phase, the other basin is in the fill phase. Therefore, two basins are needed. The activated sludge tends to settle as a flocculent mass, forming a distinctive interface with the clear supernatant. This phase is critical part of the cycle, because if

the solids do not settle rapidly, some sludge can be drawn off during the subsequent decant phase and thereby degrade effluent quality.

The decant phase uses a decanter to remove the clear supernatant effluent. A floating decanter maintains the inlet orifice slightly below the water surface to minimize the removal of solids in the effluent removed during the decant phase.

Between the decant and fill phases is the idle phase. During this phase, a small amount of activated sludge at the bottom of the SBR basin is pumped out to the sludge drying beds. An aerobic digester may be needed to further condition the sludge prior to the drying beds.

Flow equalization would be needed ahead of the SBR tanks. The flow equalization and fine screens will ensure the waste stream entering the SBR tanks is free of grease, scum, rags, sticks, floatables, and other debris, making it easier to treat.

Two SBR concrete tanks will be provided to allow for redundancy and the ability to fill one tank while the other tank is in the process of treating the wastewater. Disposal could continue to be done via the evaporation/percolation in the existing ponds.

4.5.4 Alternative 4 – Modify Existing Treatment Plant

As discussed in Section 3, there are many issues with the existing treatment plant. The plant cannot operate at its design flow rate of 0.15 mgd. This is partially due to the inability of the membranes to handle the design flow rate. Because of this, the operators bypass 50% to 70% of the influent flow to the original Imhoff tank where it receives minimal treatment. On average, the WWTP is treating 0.04 mgd; any greater flow is bypassed. Below are some recommendations to improve the existing treatment process.

1. Add an equalization basin after the existing WWTP lift station to supplement the existing smaller, equalization basins so the existing gravity line does not have to be used for raw influent storage. Surcharging the influent sewer can result in grease build-up, odors and solids settling in the sewer and is not a recommended practice. The total equalization capacity should be about 20 to 30 percent of the ADF capacity, or about 50,000 to 75,000 gallons. The basin should have provisions for mixing without aeration and aeration for odor control.
2. Install cathodic protection on the coated metal tanks to extend the life of the coating.

3. Install at least one additional treatment process train (to make three total trains) to increase the capacity of the WWTP.
4. Construct additional sludge drying beds.
5. Install different membranes to increase thru put through the membranes. This should also be done to increase time between membrane cleanings.
6. Install a walkway around the outside perimeter of the tanks to allow easier servicing of the motors and pumps mounted on the outside of the tanks.
7. Install level probes in each tank section and DO probes in the activated sludge areas.

Even with these improvements, it is not known if the upgraded treatment process will consistently meet the limitations in the WDR because of the limitations of the existing treatment process train.

It should be noted that the fine screening process is critical to the performance of membrane systems and the MBR will require an upgraded and more reliable (i.e. redundant fine screens) screening system than the other alternatives.

It is unclear whether the Biowheel contributes to the clogging of the existing membranes by sloughing biomass. If it is necessary to remove the Biowheel and the system is converted to a suspended activated sludge system, the modules may not have sufficient capacity. It should be assumed that if a different manufacturer's membranes are utilized, to guarantee performance, additional unknown modifications now may be needed. New process instrumentation and programming may be required. It is unlikely that with extensive modifications to the existing system that any process or performance guarantee can be obtained.

Although the MBR system provides the highest water quality, there is no identified effluent use that requires this high level of treatment. Thus, the MBR process does not currently provide any advantage over the other alternatives.

The existing WWTP is only capable of hydraulically handling 30 to 50% of the influent flow. The wastewater that is treated in the WWTP process does not consistently meet the WDR limitations. The manufacturer of the wastewater treatment plant was not able to solve these issues during the warrantee period. The operators have been unable to solve these issues either in the years they have been operating the WWTP. It is unknown if the existing WWTP can be modified to treat the design flow and meet WDR limitations. Although this option has potentially the lowest capital cost, operations and maintenance costs make this the most expensive

alternative based on present worth costs. There is also a high degree of uncertainty in the estimated capital costs from the reasons outlined above.

4.6 Effluent Disposal Alternatives

4.6.1 Agricultural Irrigation

Effluent from the DPMC pond treatment system would be stored in the existing disposal ponds. These ponds would be lined as part of the project to prevent percolation of the effluent due to the expected high levels of nitrate in the effluent. The ponds have a surface area of 5.6 acres and a working depth of 8.4 feet. Total storage is approximately 46.7 acre-feet.

Water and nitrogen balances were developed for the project to confirm the adequacy of the storage ponds and to determine the amount of crop area needed for effluent disposal (**Appendix C**). The crop was assumed to be alfalfa which would be harvested and used for feed/fodder for non-milk producing animals. As the DPMC system does not denitrify the wastewater, effluent nitrogen loading on the crop was assumed to be 45 mg/L or 45 lbs per day of nitrogen at the design flowrate of 0.12 mgd. Alfalfa has a nitrogen demand of 480 lbs/acre/year. To apply the effluent at agronomic rates for nitrogen, 36 acres of land is required. **Table 4-3** summarizes the nitrogen balance based on the design flow, nitrogen concentration and crop land needed. This amount of land will require supplemental irrigation water even in wet (100-year return interval) years to keep the crop viable. Supplemental irrigation water requirements are as follows:

- Wet year: 108 acre-feet
- Average year: 124 acre-feet
- Dry year: 135 acre-feet

The District currently does not have a source of supplemental water. Under the Sustainable Groundwater Management Act (SGMA), the District is limited on the volume of groundwater that it will be allowed to pump. The estimated native yield for the Kern Groundwater Basin is approximately 0.15 acre-feet/acre. Assumming this results in approximately 5 acre-feet of water supply for the irrigated acreage, the District would need to obtain between approximately 108 and 135 acre-feet per year of supplemental water supply from the Semitropic Water Storage District or other sellers. Water costs have increased in price over the past decade and are at least $400 per acre-foot for a long term supply.

The District owns 40 acres of cropland west of the existing WWTP. Approximately 10 acres located in the southern portion of this parcel has been tentatively identified as

potentially containing cultural resources. In addition, the District has planned to reserve 2 acres of this parcel for a solar array to help defray power costs of the new WWTP. Therefore, effluent disposal by agricultural irrigation would require leasing or purchasing 10 – 15 acres of additional land for effluent application and to provide required buffers around the application areas.

The present worth cost of the DPMC pond treatment system is more expensive than the Biolac treatment system. Disposal of the effluent from the Biolac system creates no additional costs as it will be discharged into the existing percolation ponds.

The DPMC pond treatment system would require contracting with a local farmer to plant, irrigate and harvest the crop, additional costs for land purchase or long-term lease, and a significant amount of supplemental irrigation water. The value of the harvested crop would not cover these additional costs, making the DPMC pond treatment system even more expensive than the Biolac system.

Table 4-3 Nitrogen Balance for Effluent Disposal

Design Values:			
Design Flowrate:	**0.120**	mgd	
Nitrogen Loading:	**45**	mg/L	*Assumed TN (see note 1)*
Nitrogen Loading:	*45*	*lb/day*	
Reclamation Area:	**36.0**	acres	*Actual area used*
Alfalfa Demand:	**480**	lb/ac/yr	*(see note 2)*
Alfalfa Demand:	*17,280*	*lb/yr*	

		Effluent	Total		Total	
Month	**Days**	**Applied**	**Nitrogen**		**Nitrogen**	
		(gal)	(lb/mo)		(lb/ac/mo)	
January	31	3,720,000	1,396		38.8	
February	28	3,360,000	1,261		35.0	
March	31	3,720,000	1,396		38.8	
April	30	3,600,000	1,351		37.5	
May	31	3,720,000	1,396		38.8	
June	30	3,600,000	1,351		37.5	
July	31	3,720,000	1,396		38.8	
August	31	3,720,000	1,396		38.8	
September	30	3,600,000	1,351		37.5	
October	31	3,720,000	1,396		38.8	
November	30	3,600,000	1,351		37.5	
December	31	3,720,000	1,396		38.8	
Total	**365**	**43,800,000**	**16,438**	**lb/yr**	**457**	**lb/ac/yr**
Crop Demand:			*17,280*	*lb/yr*	*480*	*lb/ac/yr*

Notes:
1. Avg. Effluent TN = 45 mg/l
2. Per Western Fertilizer Handbook

4.6.2 Percolation

Effluent from Alternative 2 – 4 would be nitrified and denitrified with a total N in the effluent of less than 10 mg/L to meet the goals of the State's Nitrate Control Program, a part of the CV-SALTS initiative. The effluent can continue to be discharged to the existing percolation ponds. No operational change is needed after the upgrades.

5 Selection of Alternative

Each of the alternatives considered has various advantages and disadvantages. This section will evaluate the costs and consider the strengths of each alternative to guide the recommendation of the most appropriate alternative for the Buttonwillow CWD WWTP.

5.1 Present Worth Cost Analysis

A present worth cost analysis is included as **Table 5-1**. The cost analysis presented in **Table 5-1** is for comparison purposes only, and only includes items specific to the treatment processes. The present worth analysis also considers ongoing operation and maintenance costs. A more detailed breakdown of existing and projected O&M costs for the selected alternative is provided in Section 5.2.

The costs include the installation of solar panels (based on 160 kw/acre of solar power) to offset ongoing electrical costs. Alternatives other than improving the existing plant includes the cost of demolishing the existing WWTP.

Construction cost estimates are based on local bid canvasses and experience on local projects. The present worth calculations include a discount rate of 3 percent per year over 20 years of operations and maintenance costs. Present worth analysis indicates that the Biolac treatment system is the most cost-effective alternative to meet the treatment and operational goals of the District.

5.2 Operations and Maintenance Costs

A breakdown of the estimated asset reserve fund for each option is included in Table 5-2. These estimates are based on the replacement cost or the equipment and the estimated average life span. A breakdown of the estimated operations and maintenance costs for all wastewater operations are included in Table 5-3. For comparison purposes, the operations and maintenance costs of the existing plant are included. The cost analysis presented shows the estimated costs with and without solar to offset electrical costs. The solar field size for each alternative was based upon the number of solar panels needed to meet the estimated yearly electrical demand.

Table 5-1 Present Worth Cost Analysis

Item No.	Item Description	Unit Price	DPMC Quantity	DPMC Cost	Biolac System Quantity	Biolac System Cost	SBR Quantity	SBR Cost	Improve Existing Process Quantity	Improve Existing Process Cost
	General Contruction Cost									
1	Mobilization, Bonds, Insurance	$285,000 / LS	1	$285,000	1	$285,000	1	$285,000	1	$285,000
2	Dust Control	$25,000 / LS	1	$25,000	1	$25,000	1	$25,000	1	$25,000
3	Worker Protection	$10,000 / LS	1	$10,000	1	$10,000	1	$10,000	1	$10,000
4	Clearing & Grubbing	$10,000 / LS	1	$10,000	1	$10,000	1	$10,000	1	$10,000
5	SWPPP Operations	$10,000 / LS	1	$10,000	1	$10,000	1	$10,000	1	$10,000
6	Startup	$10,000 / LS	1	$10,000	1	$10,000	1	$10,000	1	$10,000
	Headworks and Lift Station									
7	Existing Lift Station Refurbish	$80,000 / LS	1	$80,000	1	$80,000	1	$80,000	1	$80,000
8	Screen	$78,000 / EA	1	$78,000	1	$78,000	1	$78,000	1	$78,000
	Tax, Freight and installation		30%	$23,400	30%	$23,400	30%	$23,400	30%	$23,400
9	Concrete	$1,100 / CY	45	$49,500	45	$49,500	45	$49,500	45	$49,500
10	Piping and Valves	$11,000 EA	1	$11,000	1	$11,000	1	$11,000	1	$11,000
	General Site Work									
11	Grading	$50,000 / LS	1	$50,000	1	$50,000	1	$50,000	1	$50,000
12	Install Solar	$7,000 / KW	53	$371,000	80	$560,000	56	$392,000	160	$1,120,000
13	Modular Office Bldg	$75,000 / LS	1	$75,000	1	$75,000	1	$75,000	1	$75,000
14	Potable Water Line	$50 / FT	2,640	$132,000	2,640	$132,000	2,640	$132,000	2,640	$132,000
	Treatment									
15	Demolition of Existing WWTP Process	$220,000 / EA	1	$220,000	1	$220,000	1	$220,000	0	$0
16	Treatment Pond Excavation	$13 / CY	16,000	$208,000	2,900	$37,700	0	$0	0	$0
17	Treatment Pond Baffles	$55,000 / LS	1	$55,000	0	$0	0	$0	0	$0
18	Recycle Storage Ponds Excavation	$6.0 / CY	67,000	$402,000						
19	Treatment Pond Lining (HDPE)	$2 / SF	50,000	$100,000		$0	0	$0	0	$0
20	Treatment Pond Lining (concrete)	$9			12,500	$112,500				
21	Recycle Storage Ponds Lining	$2 / SF	240,000	$480,000						
22	Aeration/Clarifier Equipment	LS		$150,000		$354,960		$475,000		$0
23	Tax, Freight and installation		20%	$30,000	50%	$177,480	30%	$142,500	30%	$0
24	Clarifier Concrete and Excavation	$2,500 / CY	0	$0	50	$125,000	230	$575,000	0	$0
25	Return/Waste return pump station	$40,000 / EA	0	$0	1.0	$40,000			0	$0
26	Equalization Basin	$200,000 / EA					1	$200,000	1	$200,000
27	EQ Basin Lift Station	$50,000 / EA					1	$50,000	1	$50,000
28	Process Improvements	$100,000 / EA							1	$100,000
29	New Membranes	$80,000 / EA							1	$80,000
30	Additional Treatment Train	$300,000 / EA							1	$300,000
31	Effluent Irrigation Pumping	$22,000 / EA	4	$88,000						
32	Irrigation Well Work	$100,000 / LS	1	$100,000						
33	Piping and Valves	$110 / LF	300	$33,000	800	$88,000	500	$55,000	0	$0
34	Electrical and Controls	/ LS	1	$300,000	1	$400,000	1	$400,000	1	$250,000
35	Energency Generator	$70,000 / LS	1	$70,000	1	$70,000	1	$70,000	1	$70,000
36	Siteworks	$4.00 / SF	87,500	$350,000	15,000	$60,000	5,000	$20,000	5,000	$20,000
37	Fence	$20.00 / LF	7,200	$144,000	6,200	$124,000	6,200	$124,000	6,200	$124,000
38	Blower Shed	$50,000 / LS			1	$50,000				
39	Paved Access Road	$300 / ton	200	$60,000	200	$60,000	200	$60,000	200	$60,000
	Sludge Digestion/Dewatering									
40	Excavation	$12 / CY	0	$0	1,000	$12,000	1,000	$12,000	1,000	$12,000
41	Sludge Digester Structure					$56,400		$60,000		$60,000
42	Sludge Digester Equipment					$171,250		$190,000		$190,000
43	Concrete Lining for drying	$9 / SF	0	$0	15,000	$135,000	15,000	$135,000	15,000	$135,000
44	Piping and Valves	$70 / LF	0	$0	200	$14,000	200	$14,000	200	$14,000
	Subtotal			4,009,900		$3,717,190		$4,043,400		$3,633,900
	Engineering & Permitting	15%		$601,485		$557,579		$606,510		$545,085
	Environmental	3%		$120,297		$111,516		$121,302		$109,017
	Cultural Study			$150,000		$52,000		$52,000		$52,000
	Admin/legal	5%		$200,495		$185,860		$202,170		$181,695
	Survey	3%		$120,297		$111,519		$121,302		$109,017
	CM	15%		$601,485		$557,579		$606,510		$545,085
	Electrical Rule 16			$60,000		$60,000		$60,000		$60,000
	Bidding and Advertisement			$45,000		$45,000		$45,000		$45,000
	Labor Compliance			$30,000		$30,000		$30,000		$30,000
	Total Estimated Cost			**$5,938,959**		**$5,428,241**		**$5,888,194**		**$5,310,799**
	Contingency	20%		$802,000		$743,400		$808,700		$726,800
	Total Budget Cost			**$6,741,000**		**$6,172,000**		**$6,697,000**		**$6,038,000**
	Annual O&M			$ 212,893		$ 231,081		$ 270,081		$ 412,369
	O&M Present Worth, 5%, 20 years			$ 3,262,330		$ 3,541,033		$ 4,138,661		$ 6,319,063
	Total Present Worth			**$ 10,003,330**		**$ 9,713,033**		**$ 10,835,661**		**$12,357,063**

Table 5-2 Asset Reserve Estimate

		DPMC		Biolac System		SBR		Improve Existing	
Component	**Avg. Life (Years)**	Total Repl. Cost	Annual Reserve	Total Repl. Cost	Annual Reserve	Total Repl. Cost	Annual Reserve	Total Repl. Cost	Annual Reserve
Solar Panels	25	$185,500	$7,400	$280,000	$11,200	$196,000	$7,800	$560,000	$22,400
Modular Office Bldg	40	$75,000	$1,900	$75,000	$1,900	$75,000	$1,900	$75,000	$1,900
Treatment Pond Baffles	20	$55,000	$2,800	$0	$0	$0	$0	$0	$0
Treatment Pond Lining (HDPE)	20	$100,000	$5,000	$0	$0	$0	$0	$0	$0
Treatment Pond Lining (concrete)	40			$84,375	$2,100	$0	$0	$0	$0
Recycle Storage Ponds Lining	20	$480,000	$24,000	$0	$0	$0	$0	$0	$0
Aeration/Clarifier Equipment	15	$180,000	$12,000	$532,440	$35,500	$617,500	$41,200	$0	$0
Clarifier Concrete and Excavation	50	$0	$0	$125,000	$2,500	$575,000	$11,500	$0	$0
Return/Waste Pump and Motor	15	$0	$0	$40,000	$2,700	$0	$0	$0	$0
EQ Basin Pump and Motor	15	$0	$0	$0	$0	$50,000	$3,300	$50,000	$3,300
New Membranes	5	$0	$0	$0	$0	$0	$0	$80,000	$16,000
Additional Treatment Train	15	$0	$0	$0	$0	$0	$0	$225,000	$30,000
Valves	25	$5,000	$200	$5,000	$200	$5,000	$200	$5,000	$200
Electrical and Controls	15	$57,500	$3,800	$57,500	$3,800	$57,500	$3,800	$57,500	$3,800
WWTP Lift Station Pumps & Motors	18	$56,000	$3,100	$56,000	$3,100	$56,000	$3,100	$56,000	$3,100
Collection Lift Station Pumps & Motors	15	$10,000	$700	$10,000	$700	$10,000	$700	$10,000	$700
Backup Generator (Existing)	10	$35,000	$3,500	$35,000	$3,500	$35,000	$3,500	$35,000	$3,500
	Total		**$64,400**		**$67,200**		**$77,000**		**$84,900**

Table 5-3 Operations and Maintenance Costs

		DPMC		Biolac System		SBR		Improve Existing w/ Additional Treatment Trains		Existing @ 0.15 MGD	
Item	Price	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost
Labor											
WW Operator II (hourly rate)	$35	25	$ 45,500	30	$ 54,600	35	$ 63,700	35	$ 63,700	35	$ 63,700
WW Operator III (hourly rate)	$40			8	$ 16,640	10	$ 20,800	8	$ 16,640	8	$ 16,640
WWTP Operations											
Laboratory inspection, sampling											
Influent Effluent BOD, TSS	$80	108	$ 8,640	108	$ 8,640	108	$ 8,640	216	$ 17,280	108	$ 8,640
MLSS level in aeration basin	$20		$ -	54	$ 1,080	54	$ 1,080	108	$ 2,160	54	$ 1,080
Sludge level in clarifier	$10		$ -	108	$ 1,080		$ -	216	$ 2,160	108	$ 1,080
Return sludge solids level	$20		$ -	108	$ 2,160		$ -	216	$ 4,320	108	$ 2,160
Recoating Equipment ($300K/3yr)									$ 100,000		$ 100,000
Maintenance to Equipment			$ 10,000		$ 20,000		$ 30,000		$ 50,000		$ 20,000
Spare parts and materials			$ 5,000		$ 10,000		$ 20,000		$ 20,000		$ 10,000
Permits, Testing and Reporting			$ 5,000		$ 5,000		$ 5,000		$ 5,000		$ 5,000
Electrical Power (equivalent HP)	$0.20/kwh	50	$ 81,687	60	$ 98,024	60	$ 98,024	170	$ 277,736	Note 1	$ 55,000
Sludge Disposal/Pond Cleaning Reserve			$ 5,000		$ 10,000		$ 10,000		$ 10,000		$ 5,000
Solar System Maintenance	$20/kw-yr	53	$ 1,060	80	$ 1,600	56	$ 1,120	160	$ 3,200	80	$ 1,600
Collection System											
Maintenance - Collection System			$ 3,000		$ 3,000		$ 3,000		$ 3,000		$ 3,000
Electrical Power - Buttonwillow Drive Lift Station			$ 600		$ 600		$ 600		$ 600		$ 600
Administration											
Office Expense			$ 2,500		$ 2,500		$ 2,500		$ 2,500		$ 2,500
Telephone			$ 500		$ 500		$ 500		$ 500		$ 500
Directors Fees			$ 1,750		$ 1,750		$ 1,750		$ 1,750		$ 1,750
Insurance			$ 4,500		$ 4,500		$ 4,500		$ 4,500		$ 4,500
USDA Loan - P&I			$ 19,850		$ 19,850		$ 19,850		$ 19,850		$ 19,850
Asset Reserve			$ 64,400		$ 67,200		$ 77,000		$ 84,900		$ 84,900
Total Treatment O&M $/yr			**$ 259,000**		**$ 329,000**		**$ 368,000**		**$ 690,000**		**$ 408,000**
Savings with solar			$ (81,687)		$ (98,024)		$ (98,024)		$ (277,736)		$ (55,000)
Area Needed for solar			0.60 acre		1 acre		0.75 acre		2 acres		1 acre
Farming Operations											
Semitropic Assessment			$ 9,756		$ 105		$ 105		$ 105		$ 105
Purchase Supplemental Irr. Water	$400/AF	119	$ 47,440								
Pumping Electrical Cost	$0.20/kwh	71,920	$ 14,384								
Farming Operations	$1,200/Ac	36	$ 43,200								
Crop Revenue	$2,200/Ac	36	$ (79,200)								
Total Operation $/yr w/o solar			**$ 294,580**		**$ 329,105**		**$ 368,105**		**$ 690,105**		**$ 408,105**
Total Operation $/yr with solar			**$ 212,893**		**$ 231,081**		**$ 270,081**		**$ 412,369**		**$ 353,105**

Note 1. Existing Electrical cost is based on treating a portion of the total flow

Table 5-3 Operations and Maintenance Costs (continued)

Item	DPMC	Biolac System	SBR	Improve Existing
Capital Cost	$ 6,741,000	$ 6,172,000	$ 6,697,000	$ 6,038,000
O&M Cost $/yr with solar	$ 212,893	$ 231,081	$ 270,081	$ 412,369
O&M Present Worth $ (3% 20 years)	$3,262,330	$3,541,033	$4,138,661	$6,319,063
Total Present Worth	$ 10,003,330	$ 9,713,033	$ 10,835,661	$ 12,357,063

Based on the estimated operations and maintenance costs the potential impacts to sewer rates are included in Table 5-4. However, these rates are based on all sewer connections being equal in service. Further refinement of the sewer rates analysis will need to be performed at a later date.

Table 5-4 Effect on Sewer Rates

Item	DPMC	Biolac System	SBR	Improve Existing w/ Additional Treatment Trains	Existing @ 0.15 MGD
# of Connections	435	435	435	435	435
Annual O&M Cost per Connection (w/o Solar)	$ 677	$ 757	$ 846	$ 1,586	$ 938
Annual O&M Cost per Connection (w/ Solar)	$ 489	$ 531	$ 621	$ 948	$ 812
Monthly O&M Cost per Connection (w/o Solar)	$ 56	$ 63	$ 71	$ 132	$ 78
Monthly O&M Cost per Connection (w/ Solar)	$ 41	$ 44	$ 52	$ 79	$ 68

5.3 Comparison of Alternatives

The alternatives described above are compared to determine the most appropriate alternative for BCWD. The alternatives have been compared based on life cycle costs, operation history, effluent quality, process stability, complexity, and operator familiarity. Each of these parameters is weighted based on the relative importance and scored to determine the recommended alterative. A comparison matrix is presented in Table 5-5. The life cycle cost comparison is based on the present worth shown in Table 5-1, which takes into consideration the capital costs, asset reserves and ongoing operation and maintenance costs. Operation history considers the history of the treatment process and how long it has been in use, especially in the western United States. Effluent disposal considers the effluent disposal alternatives based on the

effluent quality of the treated effluent, especially with respect to BOD, TSS and Total Nitrogen. Process stability is the ability to maintain steady and consistent treatment and effluent quality. Complexity refers to how complex the treatment system is to operate. Operator familiarity is how familiar the operator is with the process, and how it compares with the operation of the existing WWTP. The Life Cycle Cost and Effluent Quality are weighted at 30% since these parameters are considered the most important – costs and compliance. The remaining parameters were all weighted at 10% each.

Alternative 1 (DPMC Aeration Pond System) would be constructed at the southern part of the existing site and would not impact the existing system during construction. This alternative would offer operational stability to shock loading with the long detention time. It would utilize intense aeration and complete mixing capabilities to eliminate the risk of temperature overturn or algae growth. A quiescent zone would be incorporated to allow for settling prior to discharge. This alternative does not include sludge removal or handling facilities. However, sludge would likely only need to be removed after 10 to 20 years of operation. Also, with two treatment ponds, one pond can be removed from service for sludge removal or liner maintenance, without impacting the treatment performance. Dredging can also be done without interrupting the operation of the ponds. This alternative will not meet the current total nitrogen discharge limitation and would require modification of the WDR to allow for application of effluent nitrogen at agronomic rates on alfalfa. The existing storage ponds will need to be lined. This alternative has the second lowest present worth cost and potentially the lowest long term treatment operation cost with significant operation history. However, the additional crop lands required for the application of effluent at agronomic rates, supplemental irrigation water, and farmer lease requirements pose uncertainties and additional costs in the operation of the effluent disposal.

Alternative 2 (Biolac) would be constructed at the southern part of the existing site. The existing treatment process would not be impacted during construction. This alternative would offer operational stability in that it would utilize a long sludge age. Biological nutrient reduction would be accomplished with control of air flow distribution in the basin with multiple oxic and anoxic zones. Sludge would be aerobically digested and air-dried in the existing and new sludge drying beds. Dried solids would be stored onsite in the sludge drying beds before hauling away for disposal. This alternative provides good effluent quality and process stability, and is less complex than the SBR alternative.

Alternative 3 (SBR) would be constructed in three reinforced-concrete structures adjacent to the existing treatment facility and would not impact the existing system during construction. One tank would be for flow equalization. The other two tanks would be the SBR tanks. Nitrification and denitrification take place in the SBR tanks.

Another sludge drying bed would be constructed. This alternative provides good effluent quality, but it is more complex and has a slightly higher life cycle cost than the Biolac alternative. Alternative 3 is considered the most complex alternative to operate.

Alternative 4 (Improve Existing WWTP) would consist of improvements to the existing WWTP process to allow the treatment of 0.15 mgd. This would include the construction of an equalization tank ahead of the treatment process and the addition of at least one more process train. This alternative has highest life cycle cost of the alternatives. While it could produce the highest quality effluent, it is not possible to determine if the WWTP can treat 0.15 mgd to comply with the WDR limitations and thus has been eliminated from further consideration.

Preliminary process layouts for each of the alternatives are included as Figure 5-1 through Figure 5-4. The solar field sizes shown on the process layouts for all alternatives was 2 acres, although for most of the alternatives the size would likely be smaller.

Table 5-5 Alternatives Comparison Matrix

Parameter	Weight	DPMC	Biolac	SBR	Improve Existing WWTP
Life cycle cost	30%	9	10	7	5
Compliance with BOD/TSS/N	20%	5	10	10	8
Effluent disposal	10%	7	10	10	8
Operations history	10%	10	8	6	5
Process stability	10%	10	9	8	5
Complexity	10%	10	7	6	5
Operator familiarity	10%	8	7	7	10
Total	100%	8.2	9.1	7.8	6.4

5.4 State Planning Priorities

CA Govt Code § 65041.1 (2017) states:

> *"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 applicable goals for this project revolve around the protection of public health and the protection of valuable natural resources. The proposed upgrades to the WWTP will protect public health by providing wastewater treatment and disposal meeting or exceeding the State's requirements. Wastewater effluent disposal by evaporation and percolation will exceed the States requirements for protection of the groundwater underlying the site. Implementation of the project will assure the continued use groundwater in the area of the WWTP for the multitude of uses that are important to the community and the State.

5.5 Climate Change Consderations

A recent executive order was put into place in 2020 to address California's response to climate change. Specifically, state agencies are directed to pursue innovative actions, strategies and partnerships to maximize the full climate benefits of our natural and working land, through:

- Healthy soils management, including planting cover crops, hedgerows and compost applications.
- Wetlands restoration to protect coastal areas.
- Active forest management to reduce catastrophic risk and restore forest health.
- Boosting green infrastructure in urban areas like trees and parks.

The proposed WWTP upgrade project will not adversely impact any of these goals. The improvements will be located in previously disturbed areas on the WWTP site and will, to the extent possible, reuse existing facilities (i.e. lift station wet well and pipes) to minimize the amount of new construction required. Biological resources (animals, birds and vegetation) will be protected during construction. The WWTP will incorporate a solar array to minimize energy impacts of the WWTP.

5.6 Water and Energy Efficiency

Water use for the four treatment options presented in this report will be about the same – primarily housekeeping and equipment washdown. The DPMC pond system will use up to 124 acre-feet/year of supplemental water to irrigate the crop. While the Biolac, SBR and membrane treatment options would help replenish the underlying aquifer through percolation, the DPMC pond treatment option would create an additional use of groundwater to grow a low value crop.

The Biolac and SBR treatment processes use the least energy of the options presented. While the DPMC pond system has lower treatment energy use, supplemental irrigation well water will be required to keep the crop viable during wet, average and dry rainfall years. This option will also consume additional energy (fuel and oil) in the planting, cultivating and harvesting of the crop.

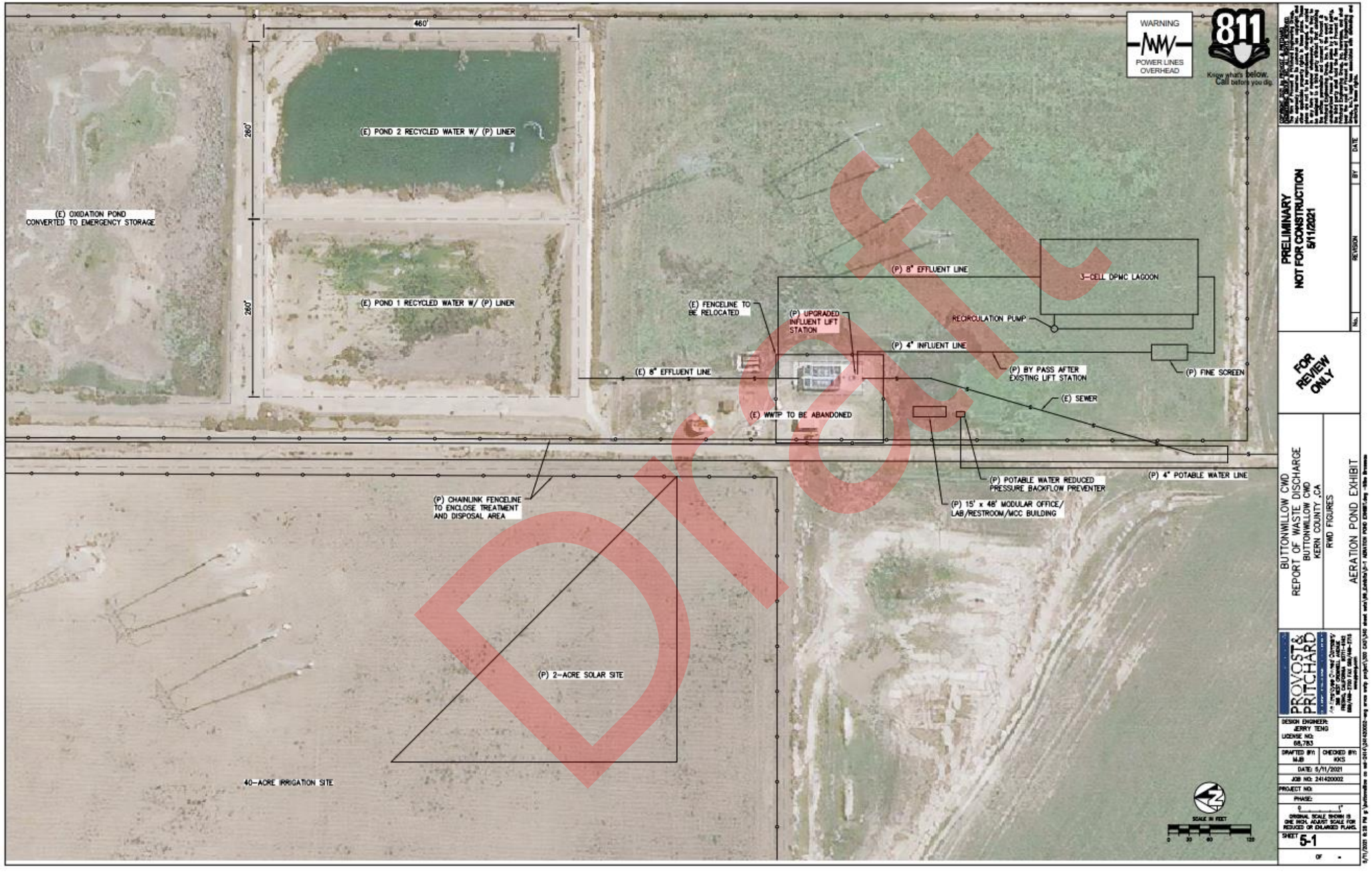


Figure 5-1 Aeration Pond Preliminary Process Layout

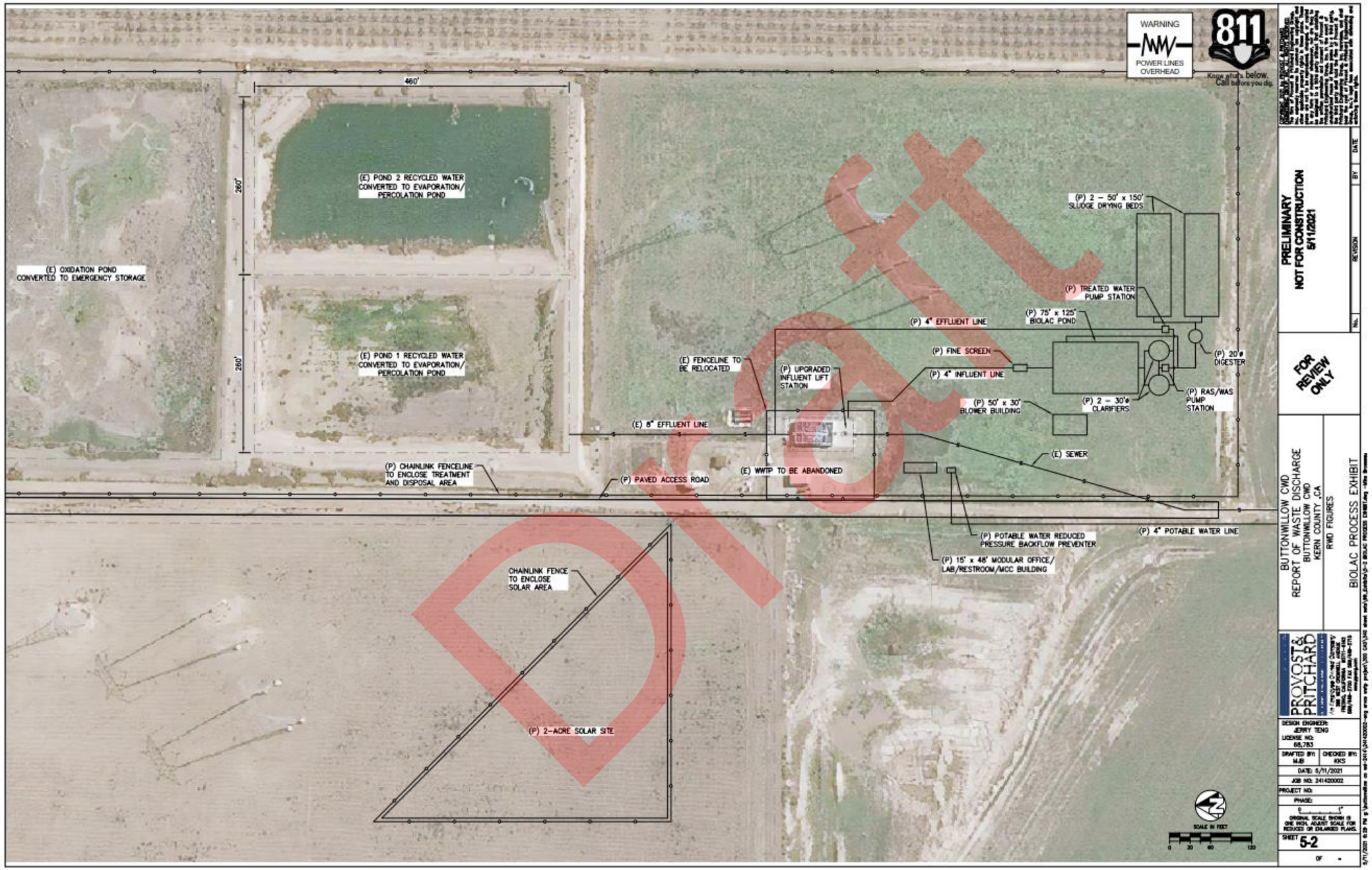


Figure 5-2 Biolac Preliminary Process Layout

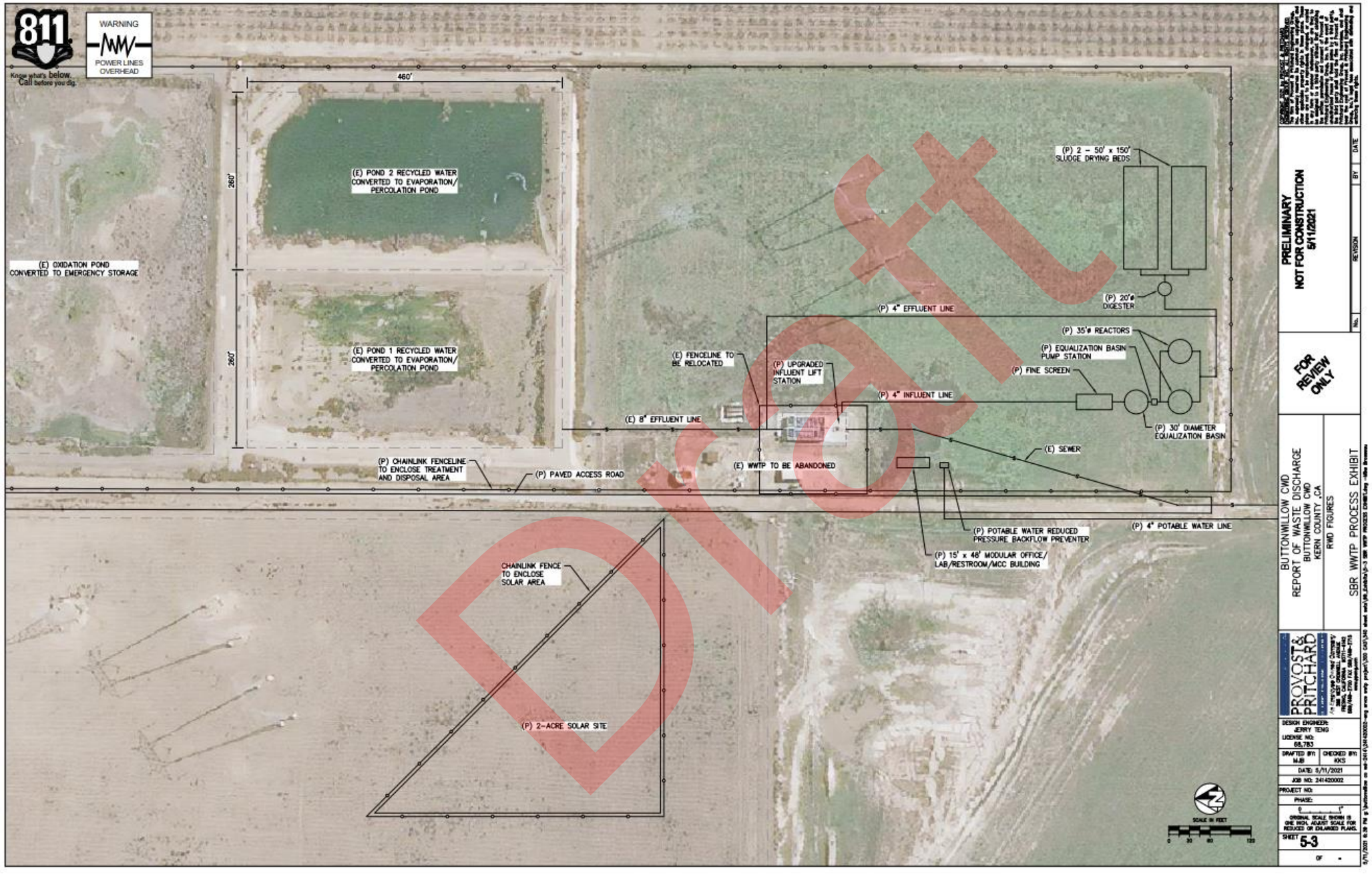


Figure 5-3 SBR Preliminary Process Layout

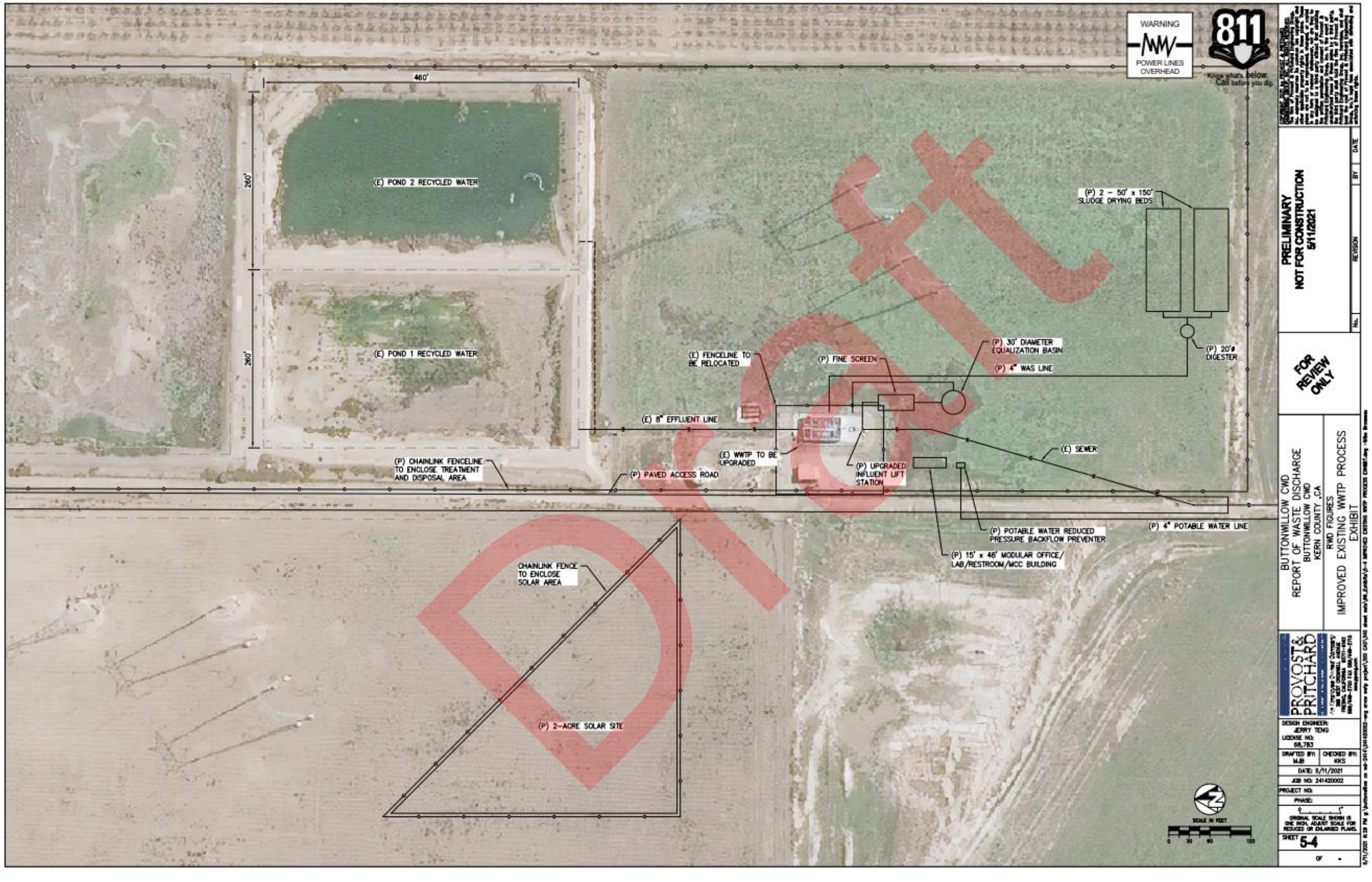


Figure 5-4 Improved Existing WWTP Process Layout

6 Proposed Project (Recommended Alternative)

6.1 Project Description

Alternative 2, Biolac Extended Aeration System, is the recommended alternative for treatment and disposal. Alternative 1 DPMC pond system was a preferred choice for simple operation; however, the nitrogen disposal requirements would impose a significant cost for effluent storage pond lining, acquisition of additional crop land and access to supplemental irrigation water. It would also increase the operational complexity for effluent disposal.

The Biolac system mainly consist of the concrete lined aeration pond with 2 circular clarifiers (see Figure 5-1). The influent lift station will be upgraded with new pumps, piping, valves and the wet well will be repaired and lined. A new headworks would be constructed with an automatically cleaned screen. Other ancillary facilities would include RAS/WAS pump station, sludge digester and drying beds, electrical, control and SCADA improvements, MCC, emergency generator, operations building and paved access road. A preliminary flow diagram is shown in Figure 6-1.

6.2 Operations During Construction

The WWTP improvements will be constructed without interrupting the existing plant operation. Rehabilitation of the existing influent lift station will require bypass pumping while the lift station improvements are made. There will be some system downtime when the flow is transferred from the existing to the new treatment system. This downtime would be coordinated with the BCWD and will be handled by the same bypass pumping system used for the lift station rehabilitation.

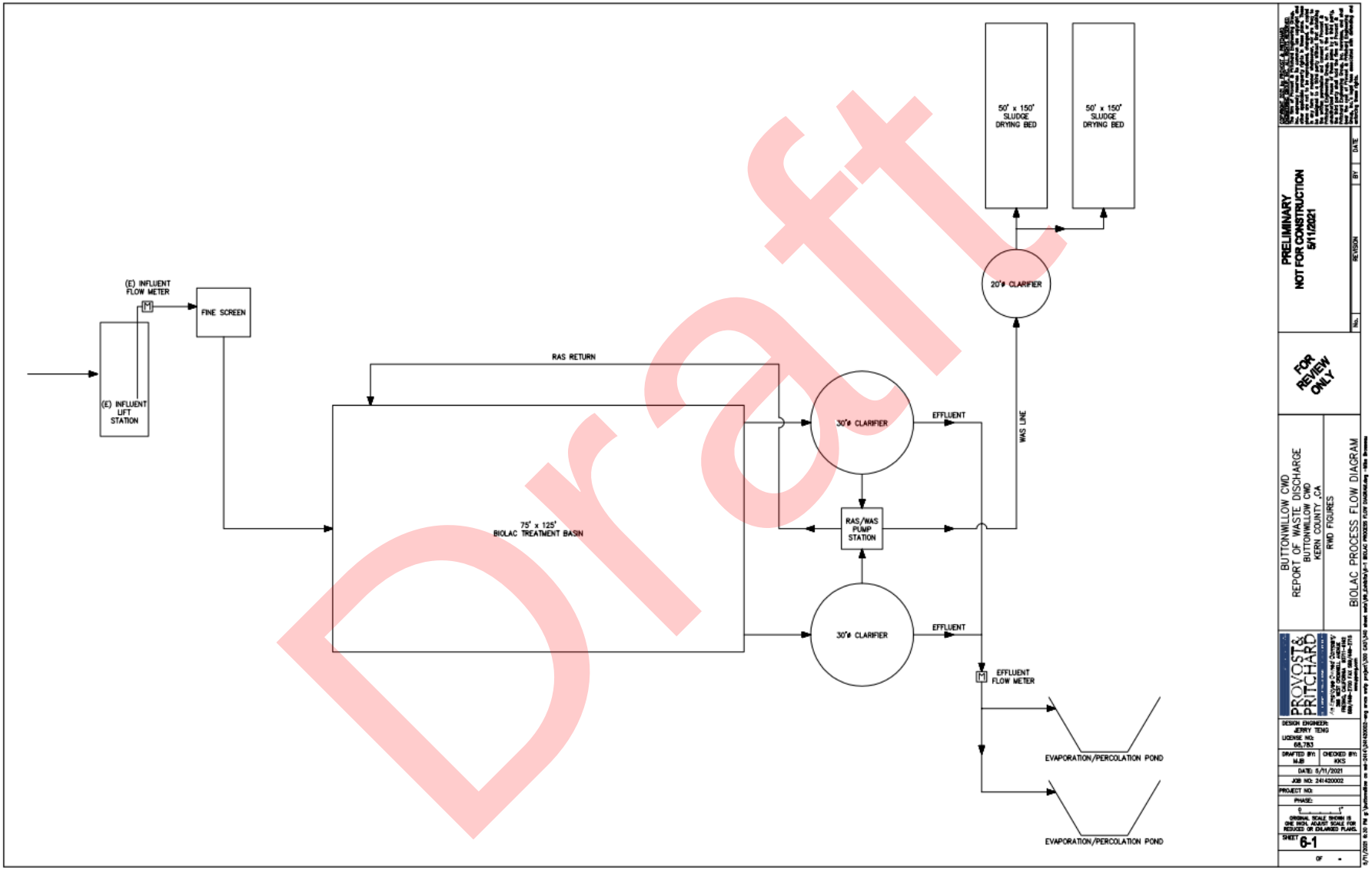


Figure 6-1 Biolac Preliminary Process Flow Diagram

6.3 Total Project Cost Estimate

The preliminary project cost estimate for the proposed Biolac WWTP improvements that have been discussed is shown as Table 6-1. Project cost estimates will be updated and refined during design of the facilities. As costs are refined, some of the additional items listed may become additive alternates that may depend on actual bid costs and the amount and type of funding available.

Table 6-1 Preliminary Total Project Cost Estimate – Biolac System

Item	Cost
Total Estimated Construction Cost	**$3,717,190**
Engineering & Permitting	$557,579
Environmental	$111,516
Cultural Study	$52,000
Admin/legal	$185,860
Survey	$111,519
CM	$557,579
Electrical Rule 16	$60,000
Bidding and Advertisement	$45,000
Labor Compliance	$30,000
Total Estimated Cost	$5,428,241
20% Contingency of Total Construction Cost	$802,000
Total Estimated Construction Phase Project Cost	**$9,947,000**
Cost Escalation to June 2023 (3%/yr)	**$10,553,000**
Cost Escalation to June 2023 (5%/yr)	**$10,967,000**

6.4 Annual Operating Budget

With the recommend Biolac Extended Aeration system, there would be an estimated net annual O&M savings (with solar) on the order of $180,000 as compared to the existing system with additional treatment train. Most of this savings is attributable to the lower electrical power and less operator attention and repairs needed for the existing treatment system.

6.5 Additional Considerations

6.5.1 Environmental Issues

Environmental compliance documents will be prepared for the proposed project in compliance with the California Environmental Quality Act (CEQA) and federal crosscutting requirements to comply with funding program requirements that include federal funds. It is anticipated that an Initial Study/Mitigated Negative Declaration will be the appropriate level of environmental document required for this project.

This work will include preparation of the documents, issuing public notice, circulating the Initial Study/Mitigated Negative Declaration for public comment, and holding a public hearing prior to adopting the Initial Study/Mitigated Negative Declaration.

Mitigation measures identified in the IS/MND will be incorporated into the contract documents for the construction of the new WWTP.

6.5.2 Permits and Agreements

A Report of Waste Discharge will need to be prepared for the proposed WWTP improvements, and submitted to the RWQCB for review and approval, and issuance of new Waste Discharge Requirements. An Antidegradation Analysis will also need to be prepared as part of the Report of Waste Discharge submitted to the RWQCB. The District has contracted with Provost & Prichard to prepare these documents. Tom Dodson and Associates has been contracted to prepare the CEQA documentation for the project.

It is the intent that the improvements described within this Report will comply with new WDR's issued for the new WWTP. No additional improvements are anticipated to bring the new WWTP into compliance with the new WDR's.

The WWTP improvement project may also involve other permits, including an Encroachment Permit, Grading Permit, Stormwater Pollution Prevention Plan (SWPPP), Dust Control Plan (DCP), and others.

6.5.3 Utility Services

The electrical service will need to be upgraded to 480V/3 phase from the existing 230V/3 phase.

Water for the operations building and equipment wash down will be needed. This will require extending a water service from the Buttonwillow community to the WWTP. The pipeline will cross an existing Buena Vista Water Storage District canal, requiring a license agreement for the encroachment.

6.5.4 Right-of-Way or Easement Requirements

Easements may be needed to install the water service pipeline from Buttonwillow to the WWTP.

6.5.5 Operator Requirements

The Biolac WWTP improvements is expected to be classified as a Class 3 WWTP (activated sludge less than 5.0 mgd) and will require a CPO with a Grade 3 certification. The BCWD operator currently has a Grade 2 certification and contracts with a Grade 5 operator as the CPO to maintain compliance for the current WWTP. Ultimately it is advised that the existing operator pursue a Grade 3 operator certification.

Appendix A Buttonwillow Waste Discharge Requirements - WDR Order No. R5-2009-0123

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2009-0123
FOR
BUTTONWILLOW COUNTY WATER DISTRICT
WASTEWATER TREATMENT FACILITY
KERN COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Central Valley Water Board), finds that:

1. Waste Discharge Requirements (WDRs) Order No. 85-303, adopted by the Central Valley Water Board on 25 October 1985, for Buttonwillow County Water District (Discharger), regulates its wastewater treatment facility (WWTF) located in the northeast quarter of Section 13, Township 29S, Range 23E, Mount Diablo Base & Meridian (MDB&M), and approximately a quarter of a mile northeast of the unincorporated community of Buttonwillow in Kern County. Buttonwillow had a population of 1,266 and a land area of about 7 square miles for Census 2000.

2. WDRs Order No. 85-303 authorizes a discharge of 0.2 million gallons per day (mgd) of treated wastewater to a storage pond and to 50 acres of Use Area owned by the Discharger. Revised MRP No. 85-303 requires the Discharger to conduct effluent monitoring for electrical conductivity, chloride, sodium, biochemical oxygen demand, total suspended solids, total nitrogen, and general minerals. Section 60304 of Title 22 allows the use of undisinfected secondary treated effluent for the application of seed crops not eaten by humans, food crops that must undergo a commercial pathogen destroying process prior to being consumed by humans, and pasture for animals that do not produce milk for human consumption.

3. In September 2008, the Discharger submitted a Report of Waste Discharge (RWD) for a proposed WWTF upgrade. WDRs Order No. 85-303 needs to be updated to ensure that the discharge is consistent with Central Valley Water Board Plans and policies, prescribe requirements that reflect changes the Discharger will make to its WWTF, and facilitate funding for the WWTF upgrade.

Wastewater Treatment Facility

4. The existing WWTF consists of an Imhoff tank, a storage pond, a sludge drying bed, and 50-acre Use Area.

5. The proposed WWTF will include two treatment trains, each with a capacity of 0.075 mgd, for a total designed daily average flow of 0.15 mgd. The upgrade will include: replacement of sewer trunk line, 1,000 feet of sewer main, a lift station, mechanical bar screen, two equalization tanks, two denitrification tanks, two Bio-tanks, two membrane tanks, two aerated sludge tanks, three concrete-lined sludge drying beds, two 22.5-acre-ft unlined storage ponds, and approximately 50 acres of Use Area.

A site map of the WWTF is shown on Attachment A and a process flow schematic is shown on Attachment B, both of which are attached hereto and made part of this Order by reference.

6. The existing deteriorated sludge drying beds are a potential source of groundwater degradation. The proposed concrete-lined drying beds should minimize any impact to groundwater. The Discharger is proposing to haul the dried sludge off site.

7. Data from January 2007 through December 2008 contained in the Discharger's Self-Monitoring Reports (SMRs) characterize the discharge as follows:

		2008	
Constituent/Parameter	Units	Influent	Effluent
pH	pH units	7.61	7.23
Electrical Conductivity (EC)[1]	µmhos/cm	2,000	1,900
Biochemical Oxygen Demand (BOD)	mg/L	160	130
Total Suspended Solids (TSS)	mg/L	100	70
Settleable Solids	mL/L	---	0.22
Chloride	mg/L	---	300
Sodium	mg/L	---	200
Nitrate (as N)	mg/L	---	0.12
Total Kjeldahl Nitrogen (TKN)	mg/L	---	40
Total Nitrogen (TN)	mg/L	---	40

[1] The monitoring indicates EC was greater than effluent EC, but the data set was small and the difference minor relative to the accuracy of the meters.

8. The existing Imhoff tank is about 50 years old and does not adequately treat wastewater.

9. According to the RWD, the proposed WWTF will produce an effluent that will meet average BOD and TSS concentrations of 40 mg/L, and an average Total Nitrogen concentration of less than 10 mg/L.

Sanitary Sewer Overflows

10. A "sanitary sewer overflow" is defined as a discharge to ground or surface water from the sanitary sewer system at any point upstream of the treatment facility. Temporary storage and conveyance facilities (such as wet wells, regulated impoundments, tanks, highlines, etc.) may be part of a sanitary sewer system and discharges to these facilities are not considered sanitary sewer overflows, provided that the waste is fully contained within these temporary storage/conveyance facilities.

11. On 2 May 2006, the State Water Resources Control Board (hereafter State Water Board) adopted General Sanitary Sewer Systems Order (State Water Board Water Quality Order No. 2006-0003-DWQ, "Statewide General Waste Discharge Requirements

for Sanitary Sewer Systems"). The General Order requires all public agencies that own or operate sanitary sewer systems greater than one mile in length to comply with this order. The Discharger's collection system is greater than one mile in length; therefore, the Discharger applied for, and is covered by, the General Order.

Water Recycling

12. The Use Area consists of approximately 50 acres of Use Area owned by the Discharger leased to Hay Brothers to grow alfalfa hay. The District will generate about three acre-feet per acre of wastewater per year. Alfalfa crops in the area require more than three acre-feet per acre of irrigation water per year, and supplemental irrigation water will be needed to meet crop demand.

13. Nitrogen uptake rates for alfalfa are 480 lb/acre/year, based on the *Western Fertilizer Handbook, 9th Edition.*

14. Nitrogen in the wastewater will be further reduced by the crops during irrigation. At the permitted flow of 0.15 mgd and an average nitrogen concentration of 10 mg/L, the total nitrogen loading to the 50-acres of Use Area is about 90 lbs/acre/year, which will not exceed the nutrient loading at agronomic rates, based on the current cropping pattern.

Site-Specific Conditions

15. The WWTF and Use Area are in an arid climate characterized by dry summers and mild winters. The rainy season generally extends from November through March. Occasional rains occur during spring and fall months, but summer months are dry. Average annual evaporation in the discharge area is about 65 inches, according to information published by the California Department of Water Resources (DWR). The 30-year normal precipitation in the discharge area is about 6.44 inches, according to the National Weather Service Forecast Office. According to the DWR, the annual precipitation with a 100-year return period is approximately 11.69 inches.

16. Soils in the vicinity of the WWTF are predominately Milham Sandy Loam, followed by Lokern Clay, according to the Web Soil Survey published by the United States Department of Agriculture Natural Resources Conservation. Milham Sandy Loam and Lokern Clay have been assigned a land capacity classification of 1 and 3S, respectively. These soils have slight to severe limitations that restrict the choice of plants or that require special conservation practices, or both. These soils have limitations within the root zone, such as shallowness of the root zone, a high content of stones, a low available water capacity, low fertility, or excessive salinity.

17. Types of crops that can be grown in the vicinity of the WWTF include: grain and hay crops, pasture, and field crops, according to the Kern County 1998 Land Use Map

published by the DWR. This is not a definitive inventory of crops that are or could be grown in the area.

18. According to the Federal Emergency Management Agency maps (community-panel number 060075 0975 B), the WWTF is located within Zone C, an area of minimal flooding.

19. The Discharger is not required to obtain coverage under a National Pollutant Discharge Elimination System General Industrial Storm Water Permit for the WWTF because all storm water runoff is retained onsite and does not discharge to a water of the United States.

Groundwater Considerations

20. WDRs Order No. 85-303 characterizes groundwater in the discharge area as follows: unconfined groundwater occurs at a depth ranging from 50 to 70 feet below ground surface, flows in a northeast direction, and exhibits an EC of about 1,500 µmhos/cm, which corresponds to an approximate total dissolved solids (TDS) concentration of 980 mg/L (TDS = 0.65 x EC).

21. The EC and TDS are approximately 1,500 µmhos/cm and 1,000 mg/L, respectively, in the unconfined aquifer and about 770 µmhos/cm and 500 mg/L, respectively in the confined aquifer, based on water quality maps in a 1999 Water Supply Report developed by the Kern County Water Agency (KCWA) and published in May 2003. This represents background water quality of the unconfined aquifer and likely represents natural conditions.

22. The Discharger gets its source water from three water supply wells (Wells 2, 3 and 4). The Discharger does not report flow-weighted averages for source water EC due to inaccurate pump flow meter readings. The straight (i.e., not flow-weighted) average source water EC based on data contained in the Discharger's SMRs from January through December 2008 is approximately 1,100 µmhos/cm.

Basin Plan, Beneficial Uses, and Water Quality Objectives

23. The *Water Quality Control Plan for the Tulare Lake Basin, Second Edition, revised January 2004* (hereafter Basin Plan) designates beneficial uses, establishes narrative and numerical water quality objectives, contains implementation plans and policies for protecting all waters of the Basin, and incorporates, by reference, plans and policies of the State Water Board. Pursuant to Section 13263(a) of the California Water Code (CWC), these requirements implement the Basin Plan.

24. Water in the Tulare Lake Basin is in short supply, requiring importation of surface water from other parts of the State. The Basin Plan encourages recycling on irrigated crops

wherever feasible and indicates that evaporation of recyclable wastewater is not an acceptable permanent disposal method where the opportunity exists to replace an existing use or proposed use of fresh water with recycled water.

25. The WWTF is in Detailed Analysis Unit (DAU) No. 255 within the Kern County Basin hydrologic unit. The Basin Plan identifies the beneficial uses of groundwater in this DAU as municipal and domestic supply, agricultural supply, industrial service supply, and wildlife habitat supply.

26. The nearest surface water is the East Side Canal. The WWTF is in the Semitropic Hydraulic Area (No. 558.70), as depicted on interagency hydrologic maps prepared by the DWR in August 1986. The Basin Plan identifies the beneficial uses for valley floor waters as agricultural supply, industrial service and process supply, water contact recreation, non-contact water recreation, warm freshwater habitat, wildlife habitat, rare, threatened, or endangered species, and groundwater recharge.

27. The Basin Plan includes a water quality objective for chemical constituents that, at a minimum, require waters designated as domestic or municipal supply to meet the maximum contaminant levels (MCLs) specified in Title 22 of the California Code of Regulations (CCR). The Basin Plan recognizes that the Central Valley Water Board may apply limits more stringent than MCLs to ensure that waters do not contain chemical constituents in concentrations that adversely affect beneficial uses.

28. The Basin Plan establishes narrative water quality objectives for Chemical Constituents, Taste and Odors, and Toxicity. The Toxicity objective, in summary, requires that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life associated with designated beneficial uses. Quantifying a narrative water quality objective requires a site-specific evaluation of those constituents that have the potential to impact water quality and beneficial uses.

29. The Basin Plan identifies the greatest long-term problem facing the entire Tulare Lake Basin as the increase in salinity in groundwater, which has accelerated due to the intensive use of soil and water resources by irrigated agriculture. The Basin Plan recognizes that degradation is unavoidable until there is a long-tern solution to the salt imbalance. Until then, the Basin Plan establishes several salt management requirements, including:

    a. The incremental increase in salts from use and treatment must be controlled to the extent possible. The maximum EC of the effluent discharged to land shall not exceed the EC of the source water plus 500 µmhos/cm. When the source water is from more than one source, the EC shall be a weighted average of all sources.

b. Discharges to areas that may recharge good quality groundwater shall not exceed an EC of 1,000 µmhos/cm, or boron content of 1.0 mg/L.

30. The underlying groundwater is not good quality and the supply water exceeds an EC of 1,000 µmhos/cm, so one cannot expect that the Discharger could comply with an effluent limit of 1,000 µmhos/cm. Because the Discharger has no accurate record of pumping from water supply wells, one cannot determine if the Discharger complies with the Basin Plan EC limit of no greater than 500 µmhos/cm over source water. The Discharger needs to implement better monitoring of its source water and review and implement salinity reduction measures.

31. The Basin Plan requires municipal WWTFs that discharge to land to comply with treatment performance standards for BOD and TSS. WWTFs that preclude public access and are greater than 1 mgd must provide removal of 80 percent or reduction to 40 mg/L, whichever is more restrictive, for both BOD and TSS.

Antidegradation Analysis

32. State Water Board Resolution No. 68-18 (the Antidegradation Policy) requires that the Regional Water Board, in regulating the discharge of waste, must maintain the high quality of waters of the state until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the state, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the Regional Water Board's policies (e.g., quality that exceeds water quality objectives). Resolution No. 68-16 also requires that waste discharged to high quality water be required to meet WDRs that will result in the best practicable treatment or control of the discharge. Resolution No. 68-16 prohibits degradation of groundwater quality as it existed in 1968, or at any time thereafter that groundwater quality was better than in 1968, other than degradation that was previously authorized. An antidegradation analysis is required for an increased volume or concentration of waste.

33. The permitted discharge will not increase mass emissions of pollutants. The wastewater facilities serve primarily domestic flow with no significant industrial flow. The constituents of concern are nitrates and total dissolved solids (TDS). The upgrade will decrease mass emission of nitrates, because of better treatment. Therefore, the discharge is in compliance with the Antidegradation Policy.

Treatment and Control Practices

34. The WWTF described in Finding Nos. 5 through 9, will provide treatment and control of the discharge that incorporates:

a. Secondary treatment;

b. Nitrogen reduction of wastewater; and

c. Recycling of wastewater for crop irrigation.

Water Recycling Criteria

35. Domestic wastewater contains pathogens harmful to humans that are typically measured by means of total or fecal coliform, as indicator organisms. The California Department of Public Health (DPH), which has primary statewide responsibility for protecting public health, has established statewide criteria in Title 22, CCR, Section 60301 et seq., (hereafter Title 22) for the use of recycled water and has developed guidelines for specific uses.

36. A 1988 Memorandum of Agreement (MOA) between DPH and the State Water Board on the use of recycled water establishes basic principles relative to the agencies and the regional water boards. In addition, the MOA allocates primary areas of responsibility and authority between these agencies, and provides for methods and mechanisms necessary to assure ongoing, continuous future coordination of activities relative to the use of recycled water in California.

37. State Water Board Resolution No. 77-1, ("Policy with Respect to Water Recycling in California"), encourages recycling projects that replace or supplement the use of fresh water, and the Water Recycling Law (CWC Section 13500-13529.4) declares that utilization of recycled water is of primary interest to the people of the State in meeting future water needs.

38. The Basin Plan encourages recycling on irrigated crops wherever feasible and indicates that evaporation of recyclable wastewater is not an acceptable permanent disposal method where the opportunity exists to replace an existing use or proposed use of fresh water with recycled water. The Basin Plan also requires project reports for new or expanded wastewater facilities shall include plans for wastewater recycling or the reason why it is not possible.

39. Title 22, Section 60323, requires recyclers of treated municipal wastewater to submit an engineering report detailing the use of recycled water, contingency plans, and safeguards. The Discharger has submitted a Title 22 Engineering Report to the Department of Public Health, but it has not been approved. A provision requiring the Discharger to submit an updated report reflecting the comments made by DPH pursuant to Title 22 of the CCR is included in this Order.

Other Regulatory Considerations

40. The United States Environmental Protection Agency (EPA) has promulgated biosolids reuse regulations in Title 40, Code of Federal Regulations, Part 503, Standards for the

Use or Disposal of Sewage Sludge, which establishes management criteria for protection of ground and surface waters, sets application rates for heavy metals, and establishes stabilization and disinfection criteria. The Discharger may have separate and/or additional compliance, reporting, and permitting responsibilities to EPA.

41. The Discharger will treat the wastewater to secondary treatment standards and reduce the nitrates to less than primary drinking water standards. The effluent will be stored for reuse by irrigation of crops, which will provide further reduction in pollutants (primarily nitrates). The effluent EC quality (about 1,900 µmhos/cm) is similar in quality to background (about 1,500 µmhos/cm). The discharge flow is low. The ponds will be constructed of native soils that are only moderately drained. The background water quality for EC of the unconfined aquifer exceeds the recommended consumer acceptance contaminant level of 900 µmhos/cm, but not the upper level of 1,600 µmhos/cm. The minimal seepage from the storage pond or percolation from recycling is not expected to be great enough to cause groundwater to exceed the upper EC level. For these reasons the discharge is exempt from the requirements of *Consolidated Regulation for Treatment, Storage, Processing, or Disposal of Solid Waste*, as set forth in Title 27, CCR, Division 2, Subdivision 1, Section 20005, et seq., (Title 27).

CEQA

42. Buttonwillow County Water District adopted a Mitigated Negative Declaration (SCH # 2006111131) for the WWTF upgrade project in accordance with the California Environmental Quality Act (CEQA) and filed a Notice of Determination on 11 May 2007.

43. Central Valley Water Board staff reviewed the Mitigated Negative Declaration and concurred with the conclusion that the project would be an improvement over the existing discharge and that the discharge would not have a significant impact on water quality particularly because the effluent quality will improve but the volume will not increase. This Order includes effluent limits for EC, BOD, TSS and nitrogen. Compliance with these will mitigate any significant impacts to water quality.

General Findings

44. Based on the threat and complexity of the discharge, the facility is determined to be classified 2-B as defined below:

    a. Category 2 threat to water quality, defined as, “Those discharges of waste that could impair the designated beneficial use of the receiving water, cause short term violation of water quality objectives, cause secondary drinking water standards to be violated, or cause a nuisance.”

b. Category B complexity, defined as, “Any discharger not included above that has physical, chemical, or biological treatment systems (except or septic systems with subsurface disposal) or any Class 2 or 3 waste management units.”

45. Pursuant to CWC Section 13263(g), discharge is a privilege, not a right, and adoption of this Order does not create a vested right to continue the discharge.

46. The Central Valley Water Board will review this Order periodically and will revise requirements when necessary.

47. CWC Section 13267(b) states that: “In conducting an investigation specified in subdivision (a), the Central Valley Water Board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge, waste outside of its region that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the Central Valley Water Board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the Central Valley Water Board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.”

48. The technical reports required by this Order and monitoring reports required by the attached Monitoring and Reporting Program (MRP) No. R5-2009-0123 are necessary to assure compliance with these waste discharge requirements. The Discharger operates the WWTF that discharges the waste subject to this Order.

49. DWR set standards for the construction and destruction of groundwater wells, as described in California Well Standards Bulletin 74-90 (June 1991) and Water Well Standards: State of California Bulletin 94-81 (December 1981). These standards, and any more stringent standards adopted by the State or county pursuant to CWC Section 13801, apply to all monitoring wells.

Public Notice

50. All the above and the supplemental information and details in the attached Information Sheet, which is incorporated by reference herein, were considered in establishing the following conditions of discharge.

51. The Discharger and interested agencies and persons have been notified of the intent to prescribe waste discharge requirements for this discharge, and they have been provided

an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

52. All comments pertaining to the discharge were heard and considered in a public meeting.

IT IS HEREBY ORDERED that Waste Discharge Requirements Order No. 85-303 is rescinded and that, pursuant to Sections 13263 and 13267 of the California Water Code, Buttonwillow County Water District and its agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the CWC and regulations adopted thereunder, shall comply with the following:

A. Prohibitions

1. Discharge of waste to surface waters or surface water drainage courses is prohibited.

2. Bypass or overflow of untreated wastes, except as allowed by Standard Provision E.2 in *Standard Provisions and Reporting Requirements for Waste Discharge Requirements*, dated 1 March 1991, is prohibited.

3. Discharge of waste classified as 'hazardous', as defined in Section 2521(a) of Title 23, CCR, Section 2510 et seq., is prohibited. Discharge of waste classified as 'designated', as defined in CWC Section 13173, in a manner that causes violation of groundwater limitations, is prohibited.

B. Effluent Limitations

1. Effluent shall not exceed the following limitations:

Constituent	Units	Monthly Average	Daily Maximum
BOD_5[1]	mg/L	40	80
TSS[2]	mg/L	40	80

[1] Five day biochemical oxygen demand (BOD_5)
[2] Total suspended solids (TSS)

The arithmetic mean of BOD and TSS in effluent samples collected over a monthly period shall not exceed 20 percent of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period (80 percent removal).

2. The 12-month rolling average EC of the discharge shall not exceed the 12-month rolling average EC of the source water plus 500 µmhos/cm. Compliance with this effluent limitation shall be determined monthly.

3. After Provision G.19 is satisfied, the Total Nitrogen in effluent discharged to the effluent pond or Use Area shall not exceed the monthly average of 10 mg/L.

C. Discharge Specifications

1. The monthly average discharge flow shall not exceed 0.15 mgd. If the Discharger can show that the treatment facility is capable of treating additional flow (see Provision G. 20) the Executive Officer may approve a flow increase up to 0.20 mgd.

2. All conveyance, treatment, storage, and disposal units shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.

3. Public contact with effluent (treatment works, Ponds, Use Area) shall be precluded through such means as fences, signs (in accordance with Title 22, CCR Section 60310(g)), or acceptable alternatives.

4. Objectionable odors shall not be perceivable beyond the limits of the WWTF property at an intensity that creates or threatens to create nuisance conditions.

5. Effluent storage ponds shall have sufficient capacity to accommodate allowable wastewater flow and design seasonal precipitation and ancillary inflow and infiltration during the winter. Design seasonal precipitation shall be based on total annual precipitation using a return period of 100 years, distributed monthly in accordance with historical rainfall patterns.

6. On or about **1 October** of each year, available effluent pond storage capacity shall at least equal the volume necessary to comply with Discharge Specification C.5.

7. Ponds shall be managed to prevent breeding of mosquitoes. In particular,

   a. An erosion control plan should assure that coves and irregularities are not created around the perimeter of the water surface.

   b. Weeds shall be minimized through control of water depth, harvesting, and herbicides.

   c. Dead algae, vegetation and other debris shall not accumulate on the water surface.

   d. Vegetation management operations in areas in which nesting birds have been observed shall be carried out either before or after, but not during, the 1 April to 30 June bird nesting season.

8. No waste constituent shall be released or discharged, or placed where it will be released or discharged, in a concentration or in a mass that caused violation of groundwater limitations.

D. Recycling Specifications

The following specifications apply to the Use Area under the ownership or control of the Discharger.

1. Use of undisinfected secondary treated recycled water shall be limited to flood irrigation of fodder, fiber, and seed crops not eaten by humans or for gazing of non-milking cattle and shall comply with the provisions of Title 22.

2. The Discharger will maintain the following setback distances from areas irrigated with recycled water:

Setback Distance (feet)	To
25	Property Line
30	Public Roads
50	Drainage Courses
100	Irrigation Wells
150	Domestic Wells

3. No physical connection shall exist between recycled water piping and any domestic water supply or domestic well, or between recycled water piping and any irrigation well that does not have an air gap or reduce pressure principle device.

4. The perimeter of the Use Area shall be graded to prevent ponding along public roads or other public areas and prevent runoff onto adjacent properties not owned or controlled by the Discharger.

5. Areas irrigated with recycled water shall be managed to prevent nuisance conditions or breeding of mosquitoes. More specifically:

   a. All applied irrigation water must infiltrate completely within a 48-hour period;

   b. Ditches not serving as wildlife habitat should be maintained free of emergent, marginal, and floating vegetation; and

   c. Low-pressure and unpressurized pipelines and ditches accessible to mosquitoes shall not be used to store recycled water.

6. Recycling of WWTF effluent shall be at reasonable agronomic rates considering the crop, soil, climate, and irrigation management plan. The annual nutrient loading of the

Use Area, including the nutritive value of organic and chemical fertilizers and recycled water, shall not exceed crop demand.

7. Public contact with recycled water shall be controlled using signs and/or other appropriate means. Signs of a size no less than four inches high by eight inches wide with proper wording (shown below) shall be placed at all areas of public access and around the perimeter of all areas used for effluent disposal or conveyance to alert the public of the use of recycled water. All signs shall display an international symbol similar to that shown in Attachment C, as part of this Order, and present the following wording:

"RECYCLED WATER – DO NOT DRINK"

"AGUA DE DESPERDICIO RECLAMADA – POR FAVOR NO TOME"

E. Sludge Specifications

Sludge in this document means the solid, semisolid, and liquid residues removed during primary, secondary, or advance wastewater treatment processes. Solid waste refers to grit and screening material generated during preliminary treatment. Residual sludge means sludge that will not be subject to further treatment at the WWTF. Biosolids refers to sludge that has undergone sufficient treatment and testing to quality for reuse pursuant to federal and state regulations as a soil amendment for agriculture, silviculture, horticulture, and land recycling.

1. Sludge and solid waste shall be removed from screens, sumps, aeration basins, ponds, clarifiers, etc. as needed to ensure optimal plant operation.

2. Treatment and storage of sludge generated by the WWTF shall be confined to the WWTF property.

3. Any handling and storage of residual sludge, solid waste, and biosolids on property of the WWTF shall be temporary (i.e., no longer than two years) and controlled and contained in a manner that minimizes leachate formation and precludes infiltration of waste constituents into soils in a mass or concentration that will violate groundwater limitations of this Order.

4. Residual sludge, biosolids, and solid waste shall be disposed of in a manner approved by the Executive Officer and consistent with Title 27. Removal for further treatment, disposal, or reuse at sites (i.e., landfill, composting sites, soil amendment sites) operated in accordance with valid waste discharge requirements will satisfy this specification.

5. Use of biosolids as a soil amendment shall comply with valid waste discharge requirements issued by a regional water board or the State Water Board or a local (e.g., county) program authorized by a regional water board. In most cases, this means the General Biosolids Order (State Water Board Water Quality Order No. 2004-12-DWQ, "General Waste Discharge Requirements for the Discharge of Biosolids to Land for Use as a Soil Amendment in Agricultural, Silvicultural, Horticultural, and Land Recycling Activities"). For a biosolids use project to be authorized by the General Biosolids Order, the Discharger must file a complete Notice of Applicability for each project.

6. Any proposed change in sludge use or disposal practice shall be reported in writing to the Executive Officer at least 90 days in advance of the change.

F. Groundwater Limitations

1. Release of waste constituents from any treatment or storage component associated with the discharge shall not cause or contribute to groundwater:

   a. Containing constituent concentrations in excess of the concentrations specified below or natural background quality whichever is greater:

      (i) Nitrate as nitrogen of 10 mg/L.

      (ii) Total Coliform Organisms of 2.2 MPN/100 mL.

      (iii) For constituents identified in Title 22, the MCLs quantified therein.

      (iv) For Electrical Conductance, 1,600 µmhos/cm.

   b. Containing taste or odor-producing constituents, toxic substances, or any other constituents in concentrations that cause nuisance or adversely affect beneficial uses.

G. Provisions

1. The Discharger shall comply with the *Standard Provisions and Reporting Requirements for Waste Discharge Requirements,* dated 1 March 1991, which are part of this Order. This attachment and its individual paragraphs are referred to as Standard Provision(s).

2. The Discharger shall comply with MRP No. R5-2009-0123, which is part of this Order, and any revisions thereto as adopted by the Central Valley Water Board or approved by the Executive Officer. The submittal date of Discharger self-monitoring reports shall be no later than submittal dates specified in the MRP.

3. The Discharger shall keep at the WWTF a copy of this Order, including its MRP, Information Sheet, attachments, and Standard Provisions, for reference by operating personnel. Key operating personnel shall be familiar with its contents.

4. The Discharger shall not allow pollutant-free wastewater to be discharged into the WWTF collection, treatment, and disposal systems in amounts that significantly diminish the system's capability to comply with this Order. Pollutant-free wastewater means storm water (i.e., inflow), groundwater (i.e., infiltration), cooling waters, and condensates that are essentially free of pollutants.

5. The Discharger must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the Discharger to achieve compliance with the conditions of this Order. Proper operation and maintenance also include adequate laboratory controls and appropriate quality assurance procedures. This Provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by the Discharger only when the operation is necessary to achieve compliance with the conditions of this Order.

6. All technical reports and work plans required herein that involve planning, investigation, evaluation, or design, or other work requiring interpretation and proper application of engineering or geologic sciences, shall be prepared by or under the direction of persons registered to practice in California pursuant to California Business and Professions Code Sections 6735, 7835, and 7835.1. As required by these laws, completed technical reports and work plans must bear the signature(s) and seal(s) of the registered professionals(s) in a manner such that all work can be clearly attributed to the professional responsible for the work.

7. The Discharger must comply with all conditions of this Order, including timely submittal of technical and monitoring reports as directed by the Executive Officer. Accordingly, the Discharger shall submit to the Central Valley Water Board on or before each report due date the specified document or, if an action is specified, a written report detailing evidence of compliance with the date and task. If noncompliance is being reported, the reasons for such noncompliance shall be stated, plus an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Central Valley Water Board by letter when it returns to compliance with the time schedule. Violations may result in enforcement action, including Central Valley Water Board or court orders requiring corrective action or imposing civil monetary liability, or in revision or rescission of this Order.

8. In the event of any change in control or ownership of land or waste treatment and storage facilities presently owned or controlled by the Discharger, the Discharger shall

notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to the Central Valley Water Board.

9. To assume operation under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the state of incorporation if a corporation, the address and telephone number of the persons responsible for contact with the Central Valley Water Board and a statement. The statement shall comply with the signatory paragraph of Standard Provision B.3 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code. If approved by the Executive Officer, the transfer request will be submitted to the Central Valley Water Board for its consideration of transferring the ownership of this Order at one of its regularly scheduled meetings.

10. As a means of discerning compliance with Discharge Specifications C.4, the dissolved oxygen (DO) content in the upper one foot of any wastewater pond shall not be less than 1.0 mg/L for three consecutive days. Should the DO be below 1.0 mg/L during a weekly sampling event, the Discharger shall take all reasonable steps to correct the problem and commence daily DO monitoring in the affected ponds until the problem has been resolved. If unpleasant odors originating from affected ponds are noticed in developed areas, or if the Discharger received one or more odor complaints, the Discharger shall report the findings in writing within 5 days of the date and shall include a specific plan to resolve the low DO results to the Central Valley Water Board within 10 days of that date.

11. The pH of the discharge to the effluent ponds shall not be less than 6.5 or greater than 8.3 pH units for more than three consecutive sampling events. In the event that the pH of the discharge is outside of this range for more than three consecutive sampling events, the Discharger shall submit a technical evaluation in its monthly SMRs documenting the pH of the discharge to the ponds, and if necessary demonstrate that the effect of the discharge on soil pH will not exceed the buffering capacity of the soil profile.

12. The Discharger shall maintain and operate all ponds sufficient to protect the integrity of containment levees and prevent overtopping or overflows. Unless a California civil engineer certifies (based on design, construction, and condition of operation and maintenance) that less freeboard is adequate, the operating freeboard in any pond shall never be less than two feet (measured vertically). As a means of management and to discern compliance with this Provision, the Discharger shall install and maintain in each pond permanent markers with calibration that indicates the water level at design capacity and enables determination of available operational freeboard.

13. The Discharger shall submit the technical reports and work plans required by this Order for Central Valley Water Board staff consideration and incorporate comments they may have in a timely manner, as appropriate. The Discharger shall proceed with all work required by the following provisions by the due dates specified.

14. The Discharger shall obtain coverage under, and comply with, Statewide General Waste Discharge Requirements For Sanitary Sewer Systems, Water Quality Order No. 2006-0003-DWQ.

15. **By 15 June 2010,** the Discharge shall install pump flow meters at each source water well in use and submit a report certifying that it has implemented measures to ensure the proper function, maintenance, and periodic calibration of these meters. The Discharger may submit an alternative for determining flow from each well to the Executive Officer for approval.

16. **By 15 June 2010,** the Discharger shall submit an adequate Title 22 Engineering Report pursuant to Title 22, California Code of Regulations, Section 60323. This provision shall be considered satisfied upon receipt by the Central Valley Water Board of written approval of this report by the California Department of Public Health.

17. **By 15 October 2010,** the Discharger shall conduct a salinity evaluation and submit a salinity minimization plan to identify and implement measures to reduce the salinity in the discharge to the extent feasible and comply with Effluent Limitation B.2. The salinity minimization plan shall include a time schedule to implement the identified measures.

18. **By 15 June 2010,** the Discharger shall submit a work plan describing its efforts to promote water conservation practices.

19. Upon completion of the WWTF upgrade as described in Finding No. 5, the Discharger shall submit engineering certification that the upgrade project has been completed as designed and that the WWTF has sufficient treatment, storage, and disposal capacity to comply with the other terms and conditions of this Order. This provision will be considered satisfied following written acknowledgement from the Executive Officer that the criteria has been met.

20. The Discharger may submit a design report certifying the WWTF has sufficient treatment, storage, and disposal capacity to comply with a monthly average discharge flow limit of 0.2 mgd. The report must be prepared by a California Registered Civil Engineer.

21. **By 15 December 2011,** the Discharger shall comply with the effluent nitrogen limitation (Effluent Limitation B.3). Alternatively, the Discharger may submit a new Report of Waste Discharge that includes a technical report that demonstrates the

performance of the effluent storage ponds. If this alternative is pursued, the performance demonstration shall establish that the pond design, along with a Nutrient Management Plan, will be protective of groundwater quality and that seepage from the ponds will not contribute to nitrogen in groundwater exceeding groundwater limitations. Any alternative shall include groundwater quality information in the storage pond and reuse area for the unconfined aquifer. This provision will be considered satisfied following written acceptance from the Executive Officer.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 10 December 2009.

Original signed by:

_____

PAMELA C. CREEDON, Executive Officer

Order Attachments:
A Site Location Map
B Flow Schematic
C Recycled Water Signage
Monitoring and Reporting Program No. R5-2009-0123
Information Sheet
Standard Provisions (1 March 2009)

DMS/DKP: 12/10/2009

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2009-0123
FOR
BUTTONWILLOW COUNTY WATER DISTRICT
WASTEWATER TREATMENT FACILITY
KERN COUNTY

This monitoring and Reporting Program (MRP) is required pursuant to California Water Code (CWC) Section 13267.

The Discharger shall not implement any changes to this MRP unless and until the Central Valley Water Board adopts or the Executive Officer issues a revised MRP. Changes to sample location shall be established with concurrence of Central Valley Water Board staff, and a description of the revised stations shall be submitted for approval by the Executive Officer.

All samples should be representative of the volume and nature of the discharge or matrix of material sampled. All analyses shall be performed in accordance with ***Standard Provisions and Reporting Requirements for Waste Discharge Requirements***, dated 1 March 1991 (Standard Provisions).

Field test instruments (such as pH) may be used provided that the operator is trained in the proper use of the instrument and each instrument is serviced and/or calibrated at the recommended frequency by the manufacturer or in accordance with manufacturer instructions.

Analytical procedures shall comply with the methods and holding times specified in the following: *Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater* (EPA); *Test Methods for Evaluating Solid Waste* (EPA); *Methods for Chemical Analysis of Water and Wastes* (EPA); *Methods for Determination of Inorganic Substances in Environmental Samples* (EPA); *Standard Methods for the Examination of Water and Wastewater* (APHA/AWWA/WEF); and *Soil, Plant and Water Reference Methods for the Western Region* (WREP 125). Approved editions shall be those that are approved for use by the United States Environmental Protection Agency or the California Department of Public Health's Environmental Laboratory Accreditation Program). The Discharger may propose alternative methods for approval by the Executive Officer.

If monitoring consistently shows no significant variation in magnitude of a constituent concentration or parameter, the Discharger may request the MRP be revised to reduce monitoring frequency. The proposal must include adequate technical justification for reduction in monitoring frequency.

A glossary of terms used within this MRP is included on page 8 and a list of the constituents required for the monitoring of Priority Pollutants is included in Table 1, which is on page 9.

INFLUENT MONITORING

Influent samples shall be collected at the inlet of the headworks of the WWTF. Time of collection of the sample shall be recorded. Influent monitoring shall include at least the following:

Frequency	Constituent/Parameter	Units	Sample Type
Continuous	Flow	mgd	Meter
Weekly	pH	pH Units	Grab
Weekly	EC	µmhos/cm	Grab
Monthly[1]	BOD_5	mg/L	24-hour composite
Monthly[1]	TSS	mg/L	24-hour composite
Monthly	Monthly Average Discharge Flow	mgd	Computed

[1] Upon completion of the WWTF upgrade, weekly monitoring shall take place for at least three months. If monitoring results shows that there are no significant variations in magnitude of a constituent concentration or parameter, and after approval by the Executive Officer, the monitoring frequency can be reduced back to monthly.

EFFLUENT MONITORING

Effluent samples shall be collected at a point in the system following treatment and before discharge to the effluent storage ponds or Use Area. Time of collection of the sample shall be recorded. Effluent monitoring shall include the following:

Frequency	Constituent/Parameter	Units	Sample Type
Weekly	pH	pH Units	Grab
Weekly	EC	µmhos/cm	Grab
Monthly[1]	BOD_5	mg/L	24-hour composite
Monthly[1]	TSS	mg/L	24-hour composite
Monthly[1]	Total Nitrogen	mg/L	Computed
Quarterly	General Minerals	mg/L	24-hour composite
Once every 5 Years[2]	Priority Pollutants (see Table 1)	Varies[3]	Varies

[1] Upon completion of the WWTF upgrade, weekly monitoring shall take place for at least three months. If monitoring results shows that there are no significant variations in magnitude of a constituent concentration or parameter, and after approval by the Executive Officer, the monitoring frequency can be reduced back to monthly.

[2] Beginning in January 2010.

[3] mg/L or µg/L, as appropriate.

POND MONITORING

Permanent markers (e.g., staff gages) shall be placed in all ponds. The markers shall have calibrations indicating water level at the design capacity and available operational freeboard. Effluent storage pond monitoring shall include at least the following:

Frequency	Constituent/Parameter	Units	Sample Type
Weekly	DO[1]	mg/L	Grab
Weekly	Freeboard	Feet[2]	Grab

[1] Should the DO be below 1.0 mg/L during a weekly sampling event, the Discharger shall take all reasonable steps to correct the problem and commence daily DO monitoring in the affected ponds until the problem has been resolved.
[2] To nearest tenth of a foot

The Discharger shall inspect the condition of the ponds weekly and record visual observations in a bound logbook. Notations shall include observations of whether weeds are developing in the water or along the bank, and their location; whether grease, dead algae, vegetation, scum, or debris are accumulating on the pond surface and their location; whether burrowing animals or insects are present; and the color of the reservoirs (e.g., dark sparkling green, dull green, yellow, gray, tan, brown, etc.). A summary of the entries made in the log shall be included in the subsequent monitoring report.

SOURCE WATER MONITORING

For each source (either well or surface water supply), the Discharger shall calculate the flow-weighted average concentrations for the specified constituents utilizing monthly flow data and the most recent chemical analysis conducted in accordance with Title 22 drinking water requirements. Alternatively, the Discharger may establish representative sampling stations within the distribution system serving the same area as is served by the WWTF.

Frequency	Constituent/Parameter	Units	Sample Type
Quarterly	Flow-Weighted EC	µmhos/cm	Computed average
Annually	General Minerals	mg/L	Computed average

SLUDGE MONITORING

Sludge shall be sampled for the following constituents:

Arsenic	Copper	Nickel
Cadmium	Lead	Selenium
Molybdenum	Mercury	Zinc

Monitoring shall be conducted: using the methods is “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods” (SW-846), as required in Title 40 of the Code of Federal Regulations (40 CFR), Part 503.8(b)(4). The constituents listed above shall be monitored at the following frequency, depending on volume generated:

Volume Generated (dry metric tons/year)	Frequency
0 to 290	Annually
290 to 1,500	Quarterly
1,500 to 15,000	Bimonthly (six samples per year)
Greater than 15,000	Monthly

The Discharger shall demonstrate that treated sludge (i.e., biosolids) meets Class A or Class B pathogens reduction levels by one of the methods listed in 40 CFR, Part 503.32.
The Discharger shall track and keep records of the operational parameters used to achieve Vector Attraction Reduction requirements in 40 CFR, Part 503.33(b).

USE AREA MONITORING

The Discharger shall perform the routine monitoring and loading calculations for each discrete irrigation area within the Use Area. Data shall be collected and presented in tabular format in accordance with Table 2.

In addition, the Discharger shall inspect the Use Area on a weekly basis. Evidence of erosion, field saturation, runoff, of the presence of nuisance conditions (i.e., flies, ponding, etc.) shall be noted in field logs and included as part of the quarterly monitoring reports.

REPORTING

All monitoring results shall be reported in **Quarterly Monitoring Reports** which are due by the first day of the second month after the calendar quarter. Therefore, monitoring reports are due as follows:

First Quarter Monitoring Report:	**1 May**
Second Quarter Monitoring Report:	**1 August**
Third Quarter Monitoring Report:	**1 November**
Fourth Quarter Monitoring Report:	**1 February**

A transmittal letter shall accompany each monitoring report. The transmittal letter shall discuss any violations that occurred during the reporting period and all actions taken or planned for correcting violations, such as operation or facility modifications. If the Discharger has previously submitted a report describing corrective actions or a time schedule for implementing the corrective actions, reference to the previous correspondence is satisfactory.

The following information is to be included on all monitoring and annual reports, as well as report transmittal letters, submitted to the Central Valley Water Board:

Discharger Name
Facility Name
MRP Number
Contact Information (telephone number and email)

In reporting monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner that illustrates clearly, whether the Discharger complies with waste discharge requirements.

In addition to the details specified in Standard Provision C.3, monitoring information shall include the method detection limit (MDL) and the reporting limit (RL) or practical quantitation

limit (PQL). If the regulatory limit for a given constituent is less than the RL (or PQL), then any analytical results for that constituent that are below the RL (or PQL) but above the MDL shall be reported and flagged as estimated.

Laboratory analysis reports do not need to be included in the monitoring reports; however, the laboratory reports must be retained for a minimum of three years in accordance with Standard Provision C.3.

All monitoring reports shall comply with the signatory requirements in Standard Provision B.3. Monitoring data or discussions submitted concerning WWTF performance must also be signed and certified by the chief plant operator. If the chief plant operator is not in direct line of supervision of the laboratory function for a Discharger conducting any of its own analyses, reports must also be signed and certified by the chief of the laboratory.

All monitoring reports that involve planning, investigation, evaluation, or design, or other work requiring interpretation and proper application of engineering or geologic sciences, shall be prepared by or under the direction of persons registered to practice in California pursuant to California Business and Professions Code sections 6735, 7835, and 7835.1.

A. All Quarterly Monitoring Reports shall include the following:

Wastewater reporting

1. The results of influent, effluent, and pond monitoring specified on page 2 and 3.

2. For each month of the quarter, calculation of the maximum daily flow and the monthly average flow.

3. For each month of the quarter, calculation of the 12-month rolling average EC of the discharge using the EC value for that month averaged with the EC values for the previous 11 months.

4. For each month of the quarter, calculation of the monthly average effluent BOD and TSS concentrations, and calculation of the percent removal of BOD and TSS compared to the influent.

5. A summary of the notations made in the pond monitoring log during each quarter. Copies of log pages covering the quarterly reporting period shall not be submitted unless requested by Central Valley Water Board staff.

Source water reporting

1. For each month of the quarter, calculation of the flow-weighted 12-month rolling average EC of the source water using monthly flow data and the source water EC values for the most recent four quarters.

B. Fourth Quarter Monitoring Reports, in addition to the above, shall include the following:

Wastewater treatment facility information

1. The names, certificate grades, and general responsibilities of all persons in charge of wastewater treatment and disposal.

2. The names and telephone numbers of persons to contact regarding the WWTF for emergency and routine situations.

3. A statement certifying when the flow meter and other monitoring instruments and devices were last calibrated, including identification of who performed the calibrations (Standard Provision C.4).

4. A statement whether the current operation and maintenance manual, sampling plan, and contingency plan, reflect the WWTF as currently constructed and operated, and the dates when these documents were last reviewed for adequacy.

5. The results of an annual evaluation conducted pursuant to Standard Provision E.4 and a figure depicting monthly average discharge flow for the previous five calendar years.

Solids/Sludge monitoring

1. Annual production totals in dry tons or cubic yards.
2. A description of disposal methods, including the following information related to the disposal methods used. If more than one method is used, include the percentage disposed of by each method.
   a. For landfill disposal, include: the name and location of the landfill, and the Order number of WDRs that regulate it.
   b. For land application, include: the location of the site, and the Order number of any WDRs that regulate it.
   c. For incineration, include: the name and location of the site where incineration occurs, the Order number of WDRs that regulate the site, the disposal method of ash, and the name and location of the facility receiving ash (if applicable).
   d. For composting, include: the location of the site, and the Order number of any WDRs that regulate it.

Use Area reporting

1. The type of crop(s) grown in the Use Area, and the quantified hydraulic and nitrogen loading rates in accordance with Table 2.

2. A summary of the notations made in the Use Area monitoring log during each quarter. The entire contents of the log do not need to be submitted.

The Discharger shall implement the above monitoring program on the first day of the month following adoption of this Order.

Ordered by: *Original signed by:*
PAMELA C. CREEDON, Executive Officer

10 December 2009
(Date)

DMS/DKP: 12/10/2009

GLOSSARY

BOD_5	Five-day biochemical oxygen demand
CBOD	Carbonaceous BOD
DO	Dissolved oxygen
EC	Electrical conductivity at 25° C
FDS	Fixed dissolved solids
NTU	Nephelometric turbidity unit
TKN	Total Kjeldahl nitrogen
TDS	Total dissolved solids
TSS	Total suspended solids
Continuous	The specified parameter shall be measured by a meter continuously.
24-Hour Composite	Samples shall be a flow-proportioned composite consisting of at least eight aliquots.
Daily	Samples shall be collected at least every day.
Twice Weekly	Samples shall be collected at least twice per week on non-consecutive days.
Weekly	Samples shall be collected at least once per week.
Twice Monthly	Samples shall be collected at least twice per month during non-consecutive weeks.
Monthly	Samples shall be collected at least once per month.
Bimonthly	Samples shall be collected at least once every two months (i.e., six times per year) during non-consecutive months.
Quarterly	Samples shall be collected at least once per calendar quarter. Unless otherwise specified or approved, samples shall be collected in January, April, July, and October.
Semiannually	Samples shall be collected at least once every six months (i.e., two times per year). Unless otherwise specified or approved, samples shall be collected in April and October.
Annually	Samples shall be collected at least once per year. Unless otherwise specified or approved, samples shall be collected in October.
mg/L	Milligrams per liter
mL/L	milliliters [of solids] per liter
µg/L	Micrograms per liter
µmhos/cm	Micromhos per centimeter
mgd	Million gallons per day
MPN/100 mL	Most probable number [of organisms] per 100 milliliters
General Minerals	Analysis for General Minerals shall include at least the following:

Alkalinity	Chloride	Sodium
Bicarbonate	Hardness	Sulfate
Calcium	Magnesium	TDS
Carbonate	Potassium	

General Minerals analyses shall be accompanied by documentation of cation/anion balance.

Table 1. Priority Pollutant Scan

Inorganics[1]	***Organics***	3-Methyl-4-Chlorophenol	Hexachlorobenzene
Antimony	Acrolein	Pentachlorophenol	Hexachlorobutadiene
Arsenic	Acrylonitrile	Phenol	Hexachlorocyclopentadiene
Beryllium	Benzene	2,4,6-Trichlorophenol	Hexachloroethane
Cadmium	Bromoform	Acenaphthene	Indeno(1,2,3-c,d)pyrene
Chromium (III)	Carbon tetrachloride	Acenaphthylene	Isophorone
Chromium (VI)	Chlorobenzene	Anthracene	Naphthalene
Copper	Chlorodibromomethane	Benzidine	Nitrobenzene
Lead	Chloroethane	Benzo(a)Anthracene	N-Nitrosodimethylamine
Mercury	2-Chloroethylvinyl Ether	Benzo(a)pyrene	N-Nitrosodi-n-Propylamine
Nickel	Chloroform	Benzo(b)fluoranthene	N-Nitrosodiphenylamine
Selenium	Dichlorobromomethane	Benzo(g,h,i)perylene	Phenanthrene
Silver	1,1-Dichloroethane	Benzo(k)fluoranthene	Pyrene
Thallium	1,2-Dichloroethane	Bis(2-chloroethoxy) methane	1,2,4-Trichlorobenzene
Zinc	1,1-Dichloroethylene	Bis(2-chloroethyl) ether	
Cyanide	1,2-Dichloropropane	Bis(2-chloroisopropyl) ether	***Pesticides***
Asbestos	1,3-Dichloropropylene	Bis(2-Ethylhexyl)phthalate	Aldrin
	Ethylbenzene	4-Bromophenyl phenyl ether	alpha-BHC
Dioxin Congeners	Methyl Bromide	Butylbenzyl Phthalate	beta-BHC
2,3,7,8-TCDD	Methyl Chloride	2-Chloronaphthalene	gamma-BHC (Lindane)
1,2,3,7,8-PentaCDD	Methylene Chloride	4-Chlorophenyl Phenyl Ether	delta-BHC
1,2,3,4,7,8-HexaCDD	1,1,2,2-Tetrachloroethane	Chrysene	Chlordane
1,2,3,6,7,8-HexaCDD	Tetrachloroethylene (PCE)	Dibenzo(a,h)Anthracene	4,4'-DDT
1,2,3,7,8,9-HexaCDD	Toluene	1,2-Dichlorobenzene	4,4'-DDE
1,2,3,4,6,7,8-HeptaCDD	1,2-Trans-Dichloroethylene	1,3-Dichlorobenzene	4,4'-DDD
OctaCDD	1,1,1-Trichloroethane	1,4-Dichlorobenzene	Dieldrin
2,3,7,8-TetraCDF	1,1,2-Trichloroethane	3,3'-Dichlorobenzidine	alpha-Endosulfan
1,2,3,7,8-PentaCDF	Trichloroethylene (TCE)	Diethyl phthalate	beta-Endosulfan
2,3,4,7,8-PentaCDF	Vinyl chloride	Dimethyl phthalate	Endosulfan Sulfate
1,2,3,4,7,8-HexaCDF	2-Chlorophenol	Di-n-Butyl Phthalate	Endrin
1,2,3,6,7,8-HexaCDF	2,4-Dichlorophenol	2,4-Dinitrotoluene	Endrin Aldehyde
1,2,3,7,8,9-HexaCDF	2,4-Dimethylphenol	2,6-Dinitrotoluene	Heptachlor
2,3,4,6,7,8-HexaCDF	2-Methyl-4,6-Dinitrophenol	Di-n-Octyl Phthalate	Heptachlor epoxide
1,2,3,4,6,7,8-HeptaCDF	2,4-Dinitrophenol	1,2-Diphenylhydrazine	Polychlorinated biphenyls
1,2,3,4,7,8,9-HeptaCDF	2-Nitrophenol	Fluoranthene	Toxaphene
OctaCDF	4-Nitrophenol	Fluorene	

[1] With the exception of wastewater samples, samples placed in an acid-preserved bottle for metals analysis must first be filtered. If filtering in the field is not feasible, samples shall be collected in unpreserved containers and submitted to the laboratory within 24 hours with a request (on the chain of custody form) to immediately filter then preserve the sample.

[2] Samples to be analyzed for volatile compounds and phthalate esters shall be grab samples; the remainder shall be 24-hour composite samples.

Table 2. Use Area Monitoring

Recycled Water Monitoring Data For Year: _____								
Parcel No. _____ of _____ acres								
		Water application				Nitrogen application		
		Water required	Effluent used	Other water used	Total irrigation water	As fertilizer	As effluent*	Total nitrogen applied
Month	Crop	(AF)	(AF)	(AF)	(AF)	(lbs/acre)	(lbs/acre)	(lbs/acre)
October								
November								
December								
Subtotal:								
January								
February								
March								
Subtotal:								
April								
May								
June								
Subtotal:								
July								
August								
September								
Subtotal:								
Annual Total:								
* calculated as (AF effluent/acre) x (2.72) x (X mg/l total nitrogen) = lbs nitrogen/acre								

INFORMATION SHEET – ORDER NO. R5-2009-0123
BUTTONWILLOW COUNTY WATER DISTRICT
WASTEWATER TREATEMENT FACILITY
KERN COUNTY

Background

Buttonwillow County Water District (hereafter Discharger) owns and operates a Wastewater Treatment Facility (WWTF) northeast of the unincorporated community of Buttonwillow. The WWTF is regulated by Waste Discharge Requirements (WDRs) Order No. 85-303 that authorizes a discharge of 0.2 million gallons per day (mgd) of undisinfected secondary treated wastewater to a storage pond and 50 acres of Use Area.

The current WWTF is about 50 years old and does not adequately treat wastewater to meet current Basin Plan requirements. The Discharger submitted a Report of Waste Discharge (RWD) dated September 2008 for a proposed WWTF upgrade.

The Discharger is proposing to upgrade the existing WWTF by adding two treatment trains running in parallel for a total designed daily average flow of 0.15 mgd. The proposed WWTF will include replacement of sewer trunkline, 1,000 feet of sewer main, a lift station, mechanical bar screen, two equalization tanks, two denitrification tanks, two Bio-tanks, two membrane tanks, two aerated sludge tanks, three concrete-lined sludge drying beds with a 4 inch thickness, and two 22.5-acre-ft unlined storage ponds and approximately 50 acres of Use Area.

WDRs Order No. 85-303 is being updated by this Order that includes WDRs for the WWTF and reclamation requirements for the 50 acres of Use Area.

Solids and Biosolids Disposal

The existing deteriorated sludge dying beds are a potential source of groundwater degradation. The Discharger is proposing to construct three concrete-lined sludge drying beds and haul the dry sludge off site.

Groundwater Conditions

WDRs Order No. 85-303 characterizes groundwater in the discharge area as follows. Unconfined groundwater occurs at a depth ranging from 50 to 70 feet below ground surface, flows in a northeast direction, and exhibits an electrical conductivity (EC) of about 1,500 µmhos/cm, which corresponds to an approximate total dissolved solids (TDS) concentration of 980 mg/L (TDS = 0.65 x EC).

In the early 1970's, the Kern County Water Agency (KCWA) sampled shallow groundwater in the discharge area. Shallow groundwater was not found immediately around the WWTF; however, in Section 17, Township 29S, Range 23E (within about 3 miles west of the WWTF) the shallow water was found to have an EC of 2,700 µmhos/cm (TDS of 1,738 mg/L). Generally to the north and west of Buttonwillow, the depth to water is less and of poorer quality (*Brackish Water Investigation Shallow Water Table Survey, Phase II*, Kern County, California, 1974).

According to water quality maps in a 1999 Water Supply Report developed by the KCWA and published in May 2003, the EC and TDS in the unconfined aquifer are approximately 1,500 µmhos/cm (EC = TDS/0.65) and 1,000 mg/L, respectively.

Below the area of the WWTF, the Corcoran Clay layer is found approximately 450 feet below ground surface. According to KCWA, the EC and TDS in the confined aquifer are about 770 µmhos/cm and 500 mg/L, respectively.

Buttonwillow Sanitary Landfill (landfill) is located west of the existing WWTF. The landfill has a groundwater monitoring system that consists of various shallow and deeper monitoring wells. The groundwater gradient is uncertain due to influences from the East Side Canal located southwest of both the landfill and WWTF.

Compliance History

On 4 December 2002, a Notice of Violation (NOV) was issued to the Discharger for threatening to violate Discharge Prohibition A.1 and Discharge Specification B.5 by threatening to discharge sludge and storm water runoff that could potentially impact surface waters, and stockpiling sludge in an inadequate storage area, respectively.

The most recent NOV was issued to the Discharger on 27 April 2006 for submitting incomplete self-monitoring reports (Provision C.1 of WDRs Order No. 85-303); particularly the lack of water supply monitoring data and biosolids monitoring data.

Basin Plan, Beneficial Uses, and Regulatory Considerations

The Basin Plan indicates the greatest long-term water quality problem facing the entire Tulare Lake Basin is increasing salinity in groundwater, a process accelerated by man's activities and particularly affected by intensive irrigated agriculture. The Basin Plan recognizes that degradation is unavoidable until there is a long-term solution to the salt imbalance. The Central Valley Water Board encourages proactive management of waste streams by dischargers to control addition of salt through use, and has established an effluent EC limitation of 500 µmhos/cm over source water EC or a 1,000 µmhos/cm, as the measure of the maximum permissible addition of salt constituents through use.

The Basin Plan states that discharges to areas that may recharge to good quality groundwater shall not exceed an EC of 1,000 µmhos/cm, or boron content of 1.0 mg/L. The groundwater is not of good quality.

Antidegradation
State Water Board Resolution No. 68-16 (the Antidegradation Policy) requires that the Regional Water Board, in regulating the discharge of waste, must maintain the high quality of water of the state until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the state, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the Region Water Board's policies (e.g., quality that exceeds water quality objectives). Resolution No. 68-16 also requires that waste discharged to high quality water be required to meet WDRs that will result in the best practicable treatment or control of the discharge. Resolution No. 68-16 prohibits degradation of groundwater quality as it existed in 1968, or at any time thereafter that groundwater quality was better than in 1968, other than degradation that was previously authorized. An antidegradation analysis is required for an increased volume or concentration of waste.

The permitted discharge will not increase mass emissions of pollutants. The upgrade will decrease mass emissions of nitrates, because of better treatment. Therefore, the discharge is in compliance with the Antidegradation Policy.

Treatment Technology and Control
The upgrade project will provide treatment and control of the discharge that incorporates:

a. Secondary treatment of the wastewater;
b. Nitrogen reduction of the wastewater; and
c. Recycling of wastewater for crop irrigation.

Title 27
The discharge meets the criteria for an exemption from the requirements of *Consolidated Regulation for Treatment, Storage, Processing, or Disposal of Solid Waste*, as set forth in Title 27, CCR, Division 2, Subdivision 1, Section 20005, et seq., (Title 27).

CEQA
Buttonwillow County Water District adopted Mitigated Negative Declaration (SCH # 2006111131) for the WWTF upgrade project in accordance with the California Environmental Quality Act (CEQA) and filed a Notice of Determination on 11 May 2007.

Central Valley Water Board staff reviewed the Mitigated Negative Declaration and concurred with the conclusion that the project would be an improvement over the existing discharge and that the discharge would not have a significant impact on water quality, particularly because the effluent quality will improve but the volume will not increase.

Proposed Order Terms and Conditions

Discharge Prohibitions, Specifications and Provisions
The proposed Order prohibits discharge to surface waters and surface water drainage courses and cross connection between potable water and well water piping with recycled water piping.

The proposed Order would set a monthly average daily flow limit of 0.15 mgd. The Discharger commented on the Tentative Waste Discharge Requirements that the flow limit should remain 0.20 mgd as in the Existing Waste Discharge Requirements. The design report submitted indicates that the new facility will be designed for just 0.15 mgd, which it should comply with. The Discharger may submit a design report that shows the new facility will be able to treat 0.20 mgd.

The Order includes effluent limits for BOD_5 and TSS each of 40 mg/L monthly average and 80 mg/L daily maximum. These limitations are based on Title 22, water recycling requirements.

The proposed Order's provisions regarding pond dissolved oxygen, and freeboard are consistent with Central Valley Water Board policy for the prevention of nuisance conditions, and are applied to all such facilities.

The proposed Order would prescribe groundwater limitations that implement water quality objectives for groundwater from the Basin Plan. The limitations require that the discharge not cause or contribute to exceedances of these objectives or natural background water quality, whichever is greater.

Monitoring Requirements

The proposed Order includes influent and effluent monitoring requirements, pond monitoring, source water monitoring, sludge monitoring, and Use Area monitoring. This monitoring is necessary to characterize the discharge, evaluate compliance with effluent limitations prescribed by the Order, and evaluate groundwater quality and the extent of the degradation caused by the discharge.

Reopener

The conditions of discharge in the proposed Order were developed based on currently available technical information and applicable water quality laws, regulations, policies, and plans, and are intended to assure conformance with them. It may be appropriate to reopen the Order if applicable laws and regulations change.

DMS/DKP: 12/10/2009

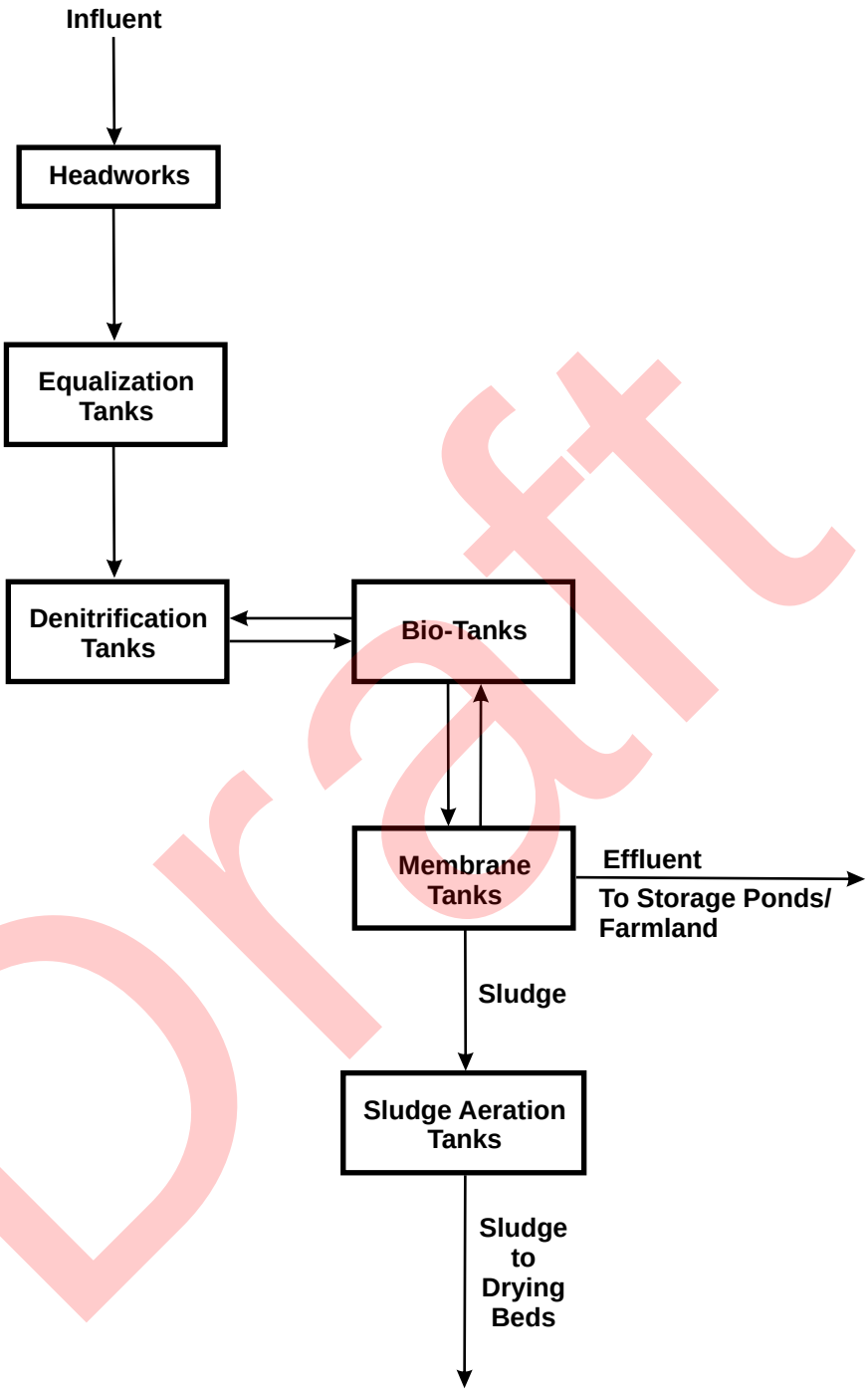
Map Source:
NAIP Aerial Photograph (2005)
Section 13, T29S, R23E, MDB&M

SCALE OF FEET
0 500 1,000 2,000

FACILITY MAP

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2009-0123
FOR
BUTTONWILLOW COUNTY WATER DISTRICT
WASTEWATER TREATMENT FACILITY
KERN COUNTY

ATTACHMENT A



NOT TO SCALE

PROCESS FLOW DIAGRAM

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2009-0123

FOR

BUTTONWILLOW COUNTY WATER DISTRICT

WASTEWATER TREATMENT FACILITY

KERN COUNTY

ATTACHMENT B

NONPOTABLE WATER INTERNATIONAL SYMBOL

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2009-0123

FOR

BUTTONWILLOW COUNTY WATER DISTRICT

WASTEWATER TREATMENT FACILITY

KERN COUNTY

ATTACHMENT C

Appendix B 2020 Annual Groundwater Monitoring Report

CRAIG M. POPE, P.E., DIRECTOR
ADMINISTRATION & HUMAN RESOURCES
FINANCE & ENGINEERING
BUILDING & CODE
OPERATIONS

KERN COUNTY PUBLIC WORKS

2700 "M" STREET, Suite 400
BAKERSFIELD, CA 93301-2370
Phone: (661) 862-5000
FAX: (661) 862-8851
Toll Free: (800) 552-5376 Option 5
TTY Relay: (800) 735-2929

April 30, 2021

SUBMITTED ELECTRONICALLY

Mrs. Kristen Gomes, P.E.
Water Resource Control Engineer
California Regional Water Quality Control Board
Central Valley Region
1685 "E" Street
Fresno, CA 93706-2020

RE: Buttonwillow Sanitary Landfill - 2020 Annual Monitoring Report, Corrective Action Program Status Report, and Financial Assurance Update
Waste Discharge Requirement Order No. R5-2018-0071
WDID No. 5D150303004

Dear Mrs. Gomes:

The Kern County Public Works Department (KCPWD) respectfully submits this document entitled, *Buttonwillow Sanitary Landfill 2020 Annual Monitoring Report, Corrective Action Program Status Report, and Financial Assurance Update,* prepared in accordance with WDR Order No. R5-2018-0071.

No changes were made to the groundwater monitoring system at the Buttonwillow Sanitary Landfill (SLF) in 2020. No violations or areas of concern were observed during the on-site inspections at the Buttonwillow SLF in 2020.

By signature of this transmittal letter, I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

If you have any questions, please contact me at (661) 862-8895.

Sincerely,

LICENSED PROFESSIONAL ENGINEER
JEFFREY BEAU DAVIS
C 90071
CIVIL
STATE OF CALIFORNIA

Jeff Davis

Jeff Davis, P.E.
Engineering Manager

04-30-2021
Date

K:\OpsMaint\Regulatory MR\ADVANCE\GRNDH2O\Annual SMRs\2020 Annual SMRs\Buttonwillow\Review\BT - 2020 Annual Monitoring Report_Ltr
Attachment: Buttonwillow Annual 2020 Self-Monitoring Report
BUT_L_WQC

BUTTONWILLOW SANITARY LANDFILL

2020 Annual Monitoring Report
Corrective Action Program Status Report
and
Financial Assurance Update

CRAIG M. POPE, DIRECTOR
Public Works Department
2700 M Street, Suite 400
Bakersfield, CA 93301

April 2021

BUTTONWILLOW SANITARY LANDFILL
2020 ANNUAL MONITORING REPORT, CORRECTIVE ACTION PROGRAM STATUS REPORT, AND FINANCIAL ASSURANCE UPDATE

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2018-0071

Prepared for:
California Regional Water Quality Control Board - Central Valley Region

Prepared by:
Kern County Public Works Department
2700 “M” Street, Suite 400
Bakersfield, CA 93301

TABLE OF CONTENTS

FIGURES

APPENDEX

1.0 INTRODUCTION

The Buttonwillow Sanitary Landfill (SLF) is a closed public landfill owned and maintained by Kern County. The site is located approximately 1.2 miles north of the community of Buttonwillow. Excluding buffer property, the landfill property covers about eight acres. The Buttonwillow SLF began operation as a burn dump during the 1940s. In 1972, it was reclassified as a Class III municipal solid waste landfill. Following construction of the transfer station in 1996, the waste accepted was limited to inert materials such as construction/demolition wastes. The landfill became inactive in mid-1998. Final closure of the landfill was completed in April 2010.

1.1 Monitoring Systems

Groundwater monitoring is conducted to evaluate the performance of facility design and operation, and to identify potential threats to human health and the environment.

The Buttonwillow SLF active monitoring system consists of one background well (BT1-01), two compliance wells (BT1-18 and BT1-19), and three Corrective Action Program (CAP) wells (BT2-02, BT2-04, and BT2-05). Groundwater monitoring wells BT2-01 and BT2-02 are dewatered and are no longer included in the groundwater monitoring system at the Buttonwillow SLF. The landfill gas (LFG) perimeter monitoring consists of 3 compliance wells (BT1-13, BT1-14, and BT1-15). Each LFG perimeter well is a dual-completed well (shallow and deep). Location of monitoring points at the Buttonwillow SLF are illustrated in Figures 1 and 2.

2.0 STATUS OF MONITORING PROGRAMS

2.1 Detection Monitoring Program

KCPWD is in compliance with the detection monitoring program provisions of Title 27 for groundwater, and in accordance with MRP No. R5-2018-0071, and the Standard Monitoring Specifications listed in Section I of the SPRRs.

Pursuant to Waste Discharge Requirements Order No. R5-2018-0071, the Water Board requested KCPWD submit an updated Site Conceptual Model and Detection Monitoring Program with hydrogeologic cross-sections showing monitoring wells, the unsaturated zone, co-related zones, the uppermost aquifer, the water table, the base of each unit, and other relevant information. The updated Site Conceptual Model and Detection Monitoring Program, submitted in June 2019, is pending Water Board approval. No changes to the DMP were made in 2020.

2.2 Evaluation Monitoring Program

The Evaluation Monitoring Program was completed in 2007, with the approval of the Corrective Action Program and WDR No. R5-2007-0091.

2.3 Corrective Action Program

As presented in the EFS report and established in the amended RWD, the groundwater Corrective Action Program (CAP) for the Buttonwillow SLF is monitored natural attenuation (MNA). MNA relies on natural, physical and biological processes to attenuate volatile organic compounds (VOCs) in groundwater and involves monitoring of these processes to assure the mechanism is effective.

In compliance with WDRs Order No. R5-2018-0071, KCPWD has been monitoring the nature and extent of the release to groundwater and the progress of the corrective action program.

3.0 FINANCIAL ASSURANCE UPDATE

3.1 Corrective Action and Closure/Post-closure Maintenance

Title 27, section 22221 requires a cost estimate for landfill closure and post-closure maintenance costs as well as an estimate for corrective action of all known or reasonably foreseeable releases at the Buttonwillow SLF.

The costs for general maintenance and repair during the postclosure maintenance period are provided through a Pledge of Revenue agreement between the County of Kern and CalRecycle. KCPWD adjusts the costs annually to account for inflation and any changes in facility design, construction, or operation.

The current financial assurance costs for corrective action and closure/postclosure maintenance period at the Buttonwillow SLF (uploaded to GeoTracker prior to the June 1 deadline) is presented in Appendix D.

4.0 LABORATORY ANALYTICAL RESULTS

Analytical results from sampling of groundwater monitoring wells conducted at the Buttonwillow SLF in 2020 are presented in tabular format in Appendix A. Historical data for the past decade are graphed and are presented in Appendix B. In order to complete the graphs, laboratory results which were reported as “not detected” (ND) have been converted to zero. Constituent MDLs and PQLs are included on the graphs. Only constituents with detections during 2020 were graphed.

Maximum Contaminant Levels (MCLs) for drinking water established by the U.S. EPA and the California Department of Health Services are included on the graphs. These goals are from “A Compilation of Water Quality Goals”, published in 2017 by the California Water Resources Control Board.

The following descriptions apply to the inclusion of MCLs on the graphs.

- The primary MCL is normally shown on the graphs. A secondary MCL is included in the absence of establishment of a primary MCL.
- In cases where an MCL has been established, but it greatly exceeds the scale shown on the graph, this is so noted in the graph footnotes.
- In cases where no MCL has been established, this is so noted in the graph footnotes.

4.1 Hydrographs

Hydrographs for active groundwater monitoring wells at the Buttonwillow SLF, presented in Appendix C, indicate changes in groundwater elevations over the past decade.

4.2 Volatile Organic Compounds

Groundwater samples collected in 2020 were submitted for analysis to BC Laboratories, a California-certified analytical laboratory in Bakersfield.

The VOCs detected in groundwater samples from the Buttonwillow SLF in 2020 are presented in Appendix A.1. The graphical representations of VOCs concentrations detected at the Buttonwillow SLF in 2020 displaying trends over the past decade are presented in Appendix B.1.

Detections of volatile organic compounds in groundwater at the Buttonwillow SLF have been very low historically. No volatile organic compounds were detected in the two 2020, semi-annual groundwater sampling events at the Buttonwillow SLF; therefore, no VOCs exceeded their respective MCLs.

4.3 General Chemistry

The groundwater samples collected during this monitoring period were analyzed for the concentrations of general chemistry monitoring parameters. The general chemistry monitoring parameters include alkalinity (as $CaCO_3$), bicarbonate (as HCO_3), calcium, chloride, hardness (as $CaCO_3$), magnesium, nitrogen (nitrate as N), potassium, sodium, sulfate, total anions, total cations, and total dissolved solids (TDS).

A list of the general chemistry constituents detected in the 2020 semi-annual monitoring events are presented in Appendix A.1. The graphical representations of general chemistry concentrations displaying trends over the past decade are presented in Appendix B.1.

The general chemistry constituents detected above their respective water quality protection standards (WQPS) and maximum contamination limits (MCLs) found in the groundwater samples at the Buttonwillow SLF in 2020 were discussed in the semi-annual report.

Trends: Historically, the different flow regimes and variation in water levels result in erratic swings in concentrations of constituents in many samples from groundwater wells at the Buttonwillow SLF (Appendix B.1). Due to dewatering of several groundwater wells at the site over the past decade, and recent installation of replacement wells, long-term trends are difficult to discern.

4.4 Inorganic (Metals)

The five-year COC sampling, metals analyses were conducted on groundwater samples in 2016. The next five-year COC sampling event is scheduled for 2021.

4.5 Stiff Diagrams

Stiff diagrams for samples from monitoring wells are presented in Appendix B.2. These types of diagrams graphically present the relationship among the major cations and anions in groundwater across the site.

5.0 CORRECTIVE ACTION PROGRAM UPDATE

Corrective Action Program (CAP) for the Buttonwillow SLF is monitored natural attenuation (MNA). MNA relies on natural physical and biological processes to attenuate volatile organic compounds (VOCs) in groundwater and involves monitoring of these processes to assure the mechanism is effective.

The nature of the release at the Buttonwillow SLF was originally demonstrated to be migration of volatile organic compounds in landfill gas to the groundwater. The extent of the release was previously described as a plume extending from the Unit to the southwest that did not occur beyond the boundaries of the waste management facility.

KCPWD submitted an Updated Conceptual Site Model (CSM) and Detection Monitoring Program (DMP) Evaluation prepared by Wood Environment & Infrastructure Solutions, Inc. (Wood) dated June 3, 2019. Wood and KCPWD developed the conceptual framework to improve the current DMP and to generate additional data to fill in data gaps for the CSM at the Buttonwillow SLF. This approach will be staged so that only a necessary number of monitoring wells will be installed to improve the existing DMP and restore its adequacy.

The CSM recommends the installation of a new background groundwater monitoring well at the Buttonwillow SLF. The current background well (BT1-01) monitors a shallower zone and is not considered in determining groundwater elevation contours. KCPWD plans to prepare a work plan for submittal to Water Board that outlines this staged approach, upon approval of the CSM.

Based upon the 2020 groundwater monitoring data from the Buttonwillow SLF, the CAP (MNA in conjunction with a passive landfill gas extraction system as a source control) is an effective corrective action toward returning to compliance with the Water Quality Protection Standards. As indicated by the nature and extent of the release, and by the decreasing types and concentration trends of VOCs detected over time (no VOCs were detected in groundwater samples in 2020), there is no evidence for additional corrective action measures at the Buttonwillow SLF.

FIGURES

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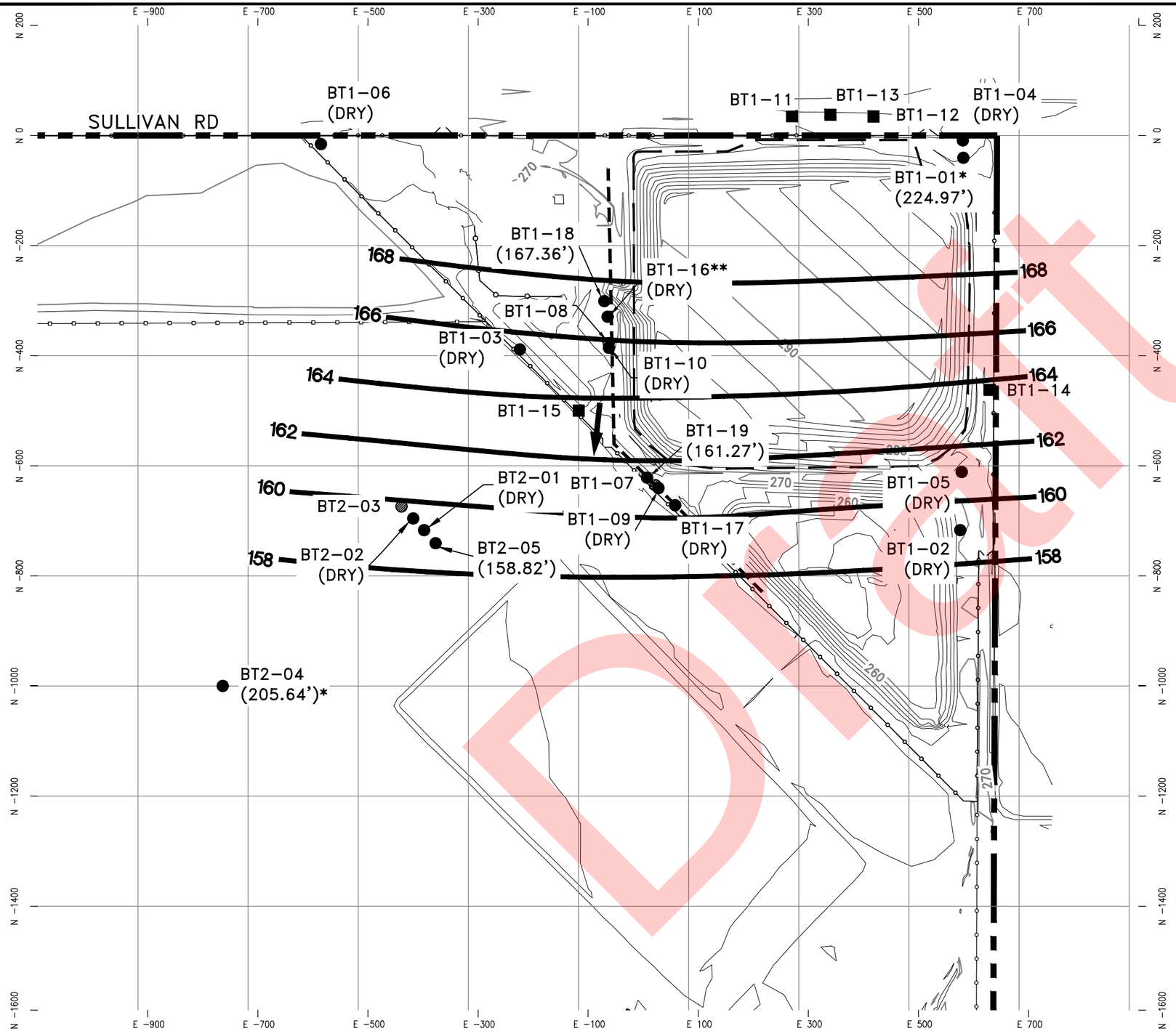
Figure 1. Groundwater Elevation Map – 2nd Quarter 2020

Figure 2. Groundwater Elevation Map – 4th Quarter 2020



N

100 0 50 100 200 300

SCALE IN FEET

LEGEND

- GROUNDWATER MONITORING WELL
- LANDFILL GAS MONITORING WELL
- DESTROYED GROUNDWATER MONITORING WELL
- ( ) GROUNDWATER ELEVATION–FEET
- APPROXIMATE LIMIT OF REFUSE
- PROPERTY BOUNDARY
- 220 LINE OF EQUAL GROUNDWATER ELEVATION (DASHED WHERE APPROXIMATE)
- GENERALIZED GROUNDWATER FLOW DIRECTION
- POINT OF COMPLIANCE

JUNE 11, 2020

GENERALIZED FLOW DIRECTION: S

GENERALIZED GRADIENT: 0.02 FT./FT.

CONTOUR INTERVAL: 2 FT.

GENERALIZED VELOCITY: 48 FT./YR.

* WELL BT2–04 MONITORS A DEEPER ZONE AND BT1–01 MONITORS A SHALLOWER ZONE AND ARE NOT CONSIDERED IN DETERMINING GROUNDWATER ELEVATION CONTOURS.

** WELL BT1–16 WAS REPLACED BY BT1–18 AND IS NOT CONSIDERED IN DETERMINING GROUND WATER ELEVATION CONTOURS.

FOR ILLUSTRATION PURPOSES ONLY

TOPOGRAPHY: MARCH 26, 2012

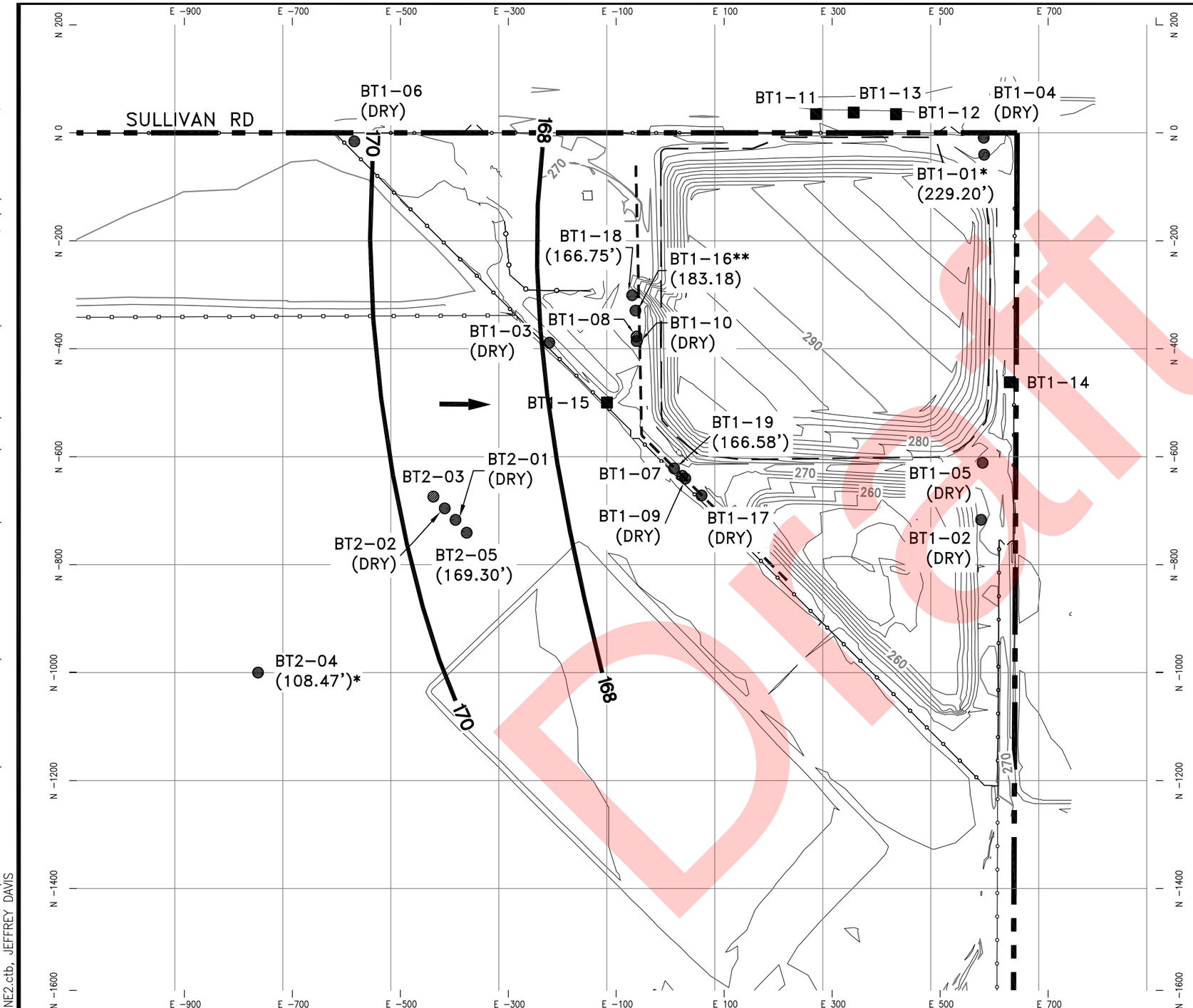
KERN COUNTY PUBLIC WORKS DEPARTMENT
BAKERSFIELD, CALIFORNIA

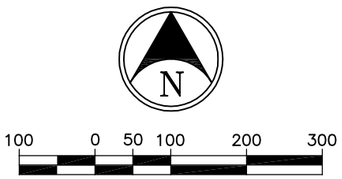
APPROVED BY:	MB
REVIEWED BY:	RP
DRAWN BY:	RH
SCALE:	1" = 200'
FILE NO:	16BWGWMQ3

BUTTONWILLOW SANITARY LANDFILL | FIGURE

GROUNDWATER ELEVATION MAP - 2nd QTR - 2020 | 1

K:\ENGINEERING\DESIGN ENGINEERING\OLD WASTE I DRIVE\1-SITE PROJECTS\TECHNICAL RESOURCES\MONITORING\GWM\GWM-Q2_2020\20BWGWMQ2.DWG, 7/9/2020 2:29 PM, 11x17BW-HALFTONE2.ctb, SCOTT RADSICK





LEGEND

- GROUNDWATER MONITORING WELL
- LANDFILL GAS MONITORING WELL
- DESTROYED GROUNDWATER MONITORING WELL
- ( ) GROUNDWATER ELEVATION–FEET
- APPROXIMATE LIMIT OF REFUSE
- PROPERTY BOUNDARY
- 170 LINE OF EQUAL GROUNDWATER ELEVATION (DASHED WHERE APPROXIMATE)
- GENERALIZED GROUNDWATER FLOW DIRECTION
- POINT OF COMPLIANCE

NOVEMBER 16, 2020

GENERALIZED FLOW DIRECTION: E

GENERALIZED GRADIENT: 0.007 FT./FT.

CONTOUR INTERVAL: 2 FT.

GENERALIZED VELOCITY: 19 FT./YR.

* WELL BT2–04 MONITORS A DEEPER ZONE AND BT1–01 MONITORS A SHALLOWER ZONE AND ARE NOT CONSIDERED IN DETERMINING GROUNDWATER ELEVATION CONTOURS.

** WELL BT1–16 WAS REPLACED BY BT1–18 AND IS NOT CONSIDERED IN DETERMINING GROUND WATER ELEVATION CONTOURS.

FOR ILLUSTRATION PURPOSES ONLY

TOPOGRAPHY: MARCH 26, 2012

KERN COUNTY PUBLIC WORKS DEPARTMENT
BAKERSFIELD, CALIFORNIA

APPROVED BY:	JD
REVIEWED BY:	JD
DRAWN BY:	JD
SCALE:	1" = 200'
FILE NO:	16BWGWMQ3

BUTTONWILLOW SANITARY LANDFILL

GROUNDWATER ELEVATION MAP – 4TH QTR. – 2020

FIGURE 2

APPENDIX A

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TABLE OF ANALYTICAL DATA

TABLE OF ANALYTICAL DATA LEGEND

ug/L	micrograms per liter
mg/L	milligrams per liter
meq/L	milliequivalents per liter
ND	Not Detected
TR	Trace
PQL	Practical Quantitation Limit
MDL	Method Detection Limit

Analytical Data
Buttonwillow Sanitary Landfill
2020

The following target analytes were reported as "not detected".

1,1,1,2-Tetrachloroethane	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane
1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene
1,1-Dichloropropene	1,2,3-Trichloropropane	1,2,4-Trichlorobenzene
1,2-Dibromo-3-chloropropane	1,2-Dibromoethane	1,2-Dichlorobenzene
1,2-Dichloroethane	1,2-Dichloropropane	1,3-Dichlorobenzene
1,3-Dichloropropane	1,4-Dichlorobenzene	2,2-Dichloropropane
2-Butanone	2-Chloro-1,3-butadiene (Chloroprene)	2-Hexanone
Acetone	Acetonitrile	Acrolein
Acrylonitrile	Allyl chloride	Benzene
Bromochloromethane	Bromodichloromethane	Bromoform
Bromomethane	Carbon disulfide	Carbon tetrachloride
Carbonate as CO3	Chlorobenzene	Chloroethane
Chloroform	Chloromethane	cis-1,2-Dichloroethene
cis-1,3-Dichloropropene	Di-isopropyl ether (DIPE)	Dibromochloromethane
Dibromomethane	Dichlorodifluoromethane	Ethanol (EtOH)
Ethyl methacrylate	Ethyl tert-butyl ether (ETBE)	Ethylbenzene
Hexachlorobutadiene	Isobutanol	Methacrylonitrile
Methyl iodide	Methyl Isobutyl Ketone	Methyl-tert-butyl ether
Methylene chloride	Methylmethacrylate	Naphthalene
Propionitrile	Styrene	tert-Amyl methyl ether (TAME)
tert-Butyl alcohol (TBA)	Tetrachloroethene (PCE)	Toluene
trans-1,2-Dichloroethene	trans-1,3-Dichloropropene	trans-1,4-Dichloro-2-butene
Trichloroethene (TCE)	Trichlorofluoromethane	Vinyl acetate
Vinyl chloride	Xylenes	

Analytical Data

Buttonwillow Sanitary Landfill

2020

Analyte	Units	Well	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Alkalinity as CaCO3	mg/L	BT1-01		340		350
	mg/L	BT1-18		320		320
	mg/L	BT1-19		280		300
	mg/L	BT2-04		99		92
	mg/L	BT2-05		340		430
	mg/L	MDL		8.2		8.2
	mg/L	PQL		8.2		8.2
Bicarbonate as HCO3	mg/L	BT1-01		420		430
	mg/L	BT1-18		390		390
	mg/L	BT1-19		340		360
	mg/L	BT2-04		120		110
	mg/L	BT2-05		420		520
	mg/L	MDL		10		10
	mg/L	PQL		10		10
Calcium	mg/L	BT1-01		60		64
	mg/L	BT1-18		54		50
	mg/L	BT1-19		140		110
	mg/L	BT2-04		58		76
	mg/L	BT2-05		150		110
	mg/L	MDL		0.016		0.016
	mg/L	PQL		0.1		0.1
Chloride	mg/L	BT1-01		640		670
	mg/L	BT1-18		490		500
	mg/L	BT1-19		560		530
	mg/L	BT2-04		61		79
	mg/L	BT2-05		510		520
	mg/L	MDL		0.65		0.65
	mg/L	PQL		2.5		2.5
Magnesium	mg/L	BT1-01		11		15
	mg/L	BT1-18		8.5		7.1
	mg/L	BT1-19		12		9
	mg/L	BT2-04		13		18
	mg/L	BT2-05		18		20
	mg/L	MDL		0.019		0.019
	mg/L	PQL		0.05		0.05
Nitrogen, Nitrate (as N)	mg/L	BT1-01		34		28
	mg/L	BT1-18		23		23
	mg/L	BT1-19		22		22
	mg/L	BT2-04		ND		ND
	mg/L	BT2-05		16		17
	mg/L	MDL		0.12		0.048
	mg/L	PQL		0.5		0.2

Analytical Data

Buttonwillow Sanitary Landfill

2020

Analyte	Units	Well	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Potassium	mg/L	BT1-01		TR		2.2
	mg/L	BT1-18		TR		1.4
	mg/L	BT1-19		1.3		1.4
	mg/L	BT2-04		1.8		1.8
	mg/L	BT2-05		1.2		TR
	mg/L	MDL		0.1		0.1
	mg/L	PQL		1		1
Sodium	mg/L	BT1-01		770		700
	mg/L	BT1-18		570		520
	mg/L	BT1-19		600		480
	mg/L	BT2-04		81		78
	mg/L	BT2-05		590		570
	mg/L	MDL		0.051		0.051
	mg/L	PQL		1		1
Sulfate	mg/L	BT1-01		350		390
	mg/L	BT1-18		200		230
	mg/L	BT1-19		350		340
	mg/L	BT2-04		170		320
	mg/L	BT2-05		570		560
	mg/L	MDL		0.7		0.28
	mg/L	PQL		5		2
Total Anions	meq/L	BT1-01		35		36
	meq/L	BT1-18		26		27
	meq/L	BT1-19		30		29
	meq/L	BT2-04		7.3		11
	meq/L	BT2-05		34		36
	meq/L	MDL		0.1		0.1
	meq/L	PQL		0.1		0.1
Total Cations	meq/L	BT1-01		38		35
	meq/L	BT1-18		28		26
	meq/L	BT1-19		34		27
	meq/L	BT2-04		7.6		8.7
	meq/L	BT2-05		35		32
	meq/L	MDL		0.1		0.1
	meq/L	PQL		0.1		0.1
Total Dissolved Solids	mg/L	BT1-01		2200		2200
	mg/L	BT1-18		1600		1600
	mg/L	BT1-19		1800		1800
	mg/L	BT2-04		460		690
	mg/L	BT2-05		2000		2100
	mg/L	MDL		50		50
	mg/L	PQL		100		100

APPENDIX B

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GRAPHICAL PRESENTATION OF DATA

ANALYTICAL DATA GRAPHS LEGEND

mg/L	milligrams per liter
ug/L	micrograms per liter
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
MCL	Maximum Contaminant Level
WQPS	Water Quality Protection Standard

NOTE: Analytical results reported as not detected (ND) are presented on the graphs as zeroes.

APPENDIX B.1

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GRAPHICAL PRESENTATION OF DATA

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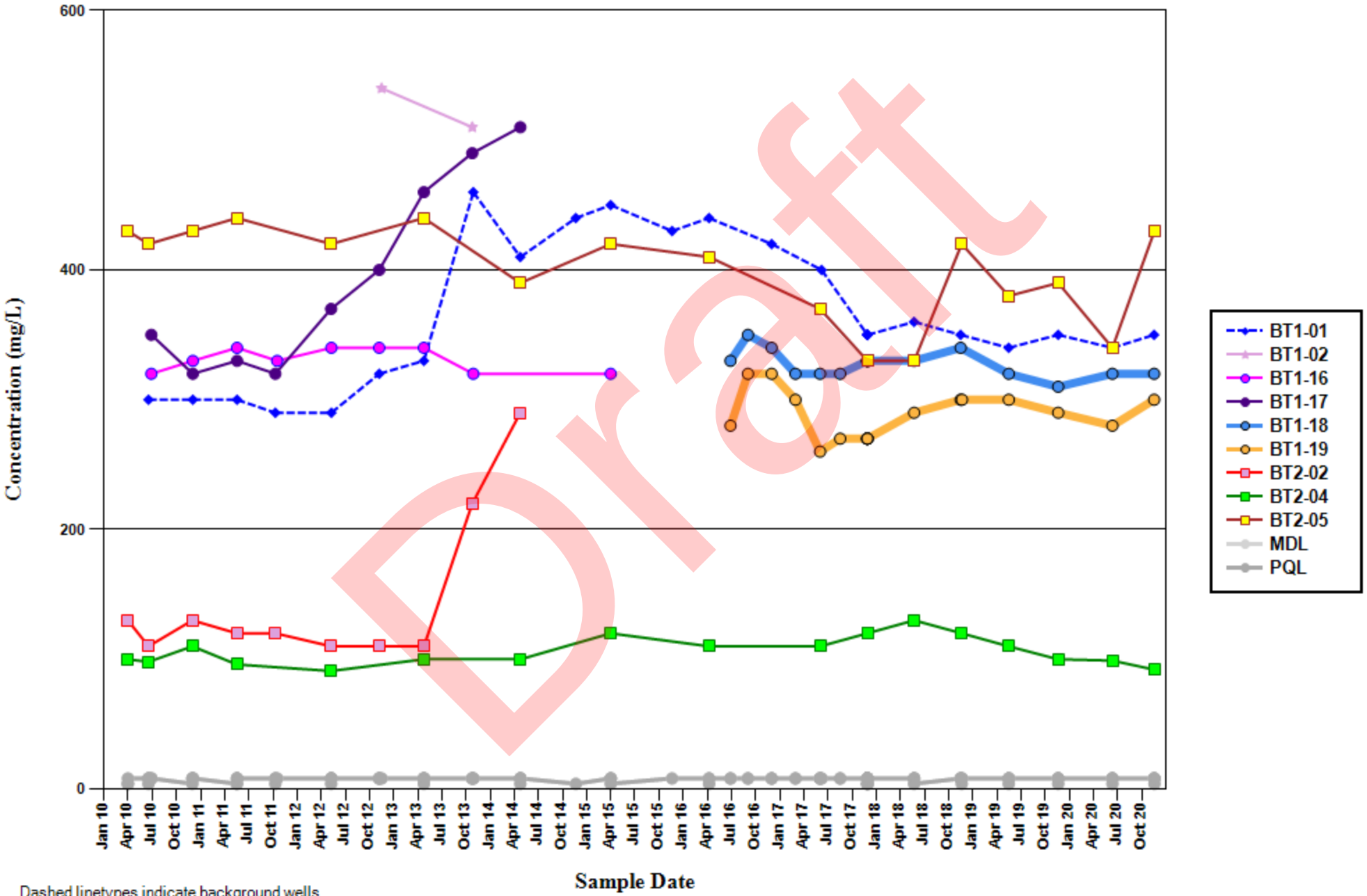
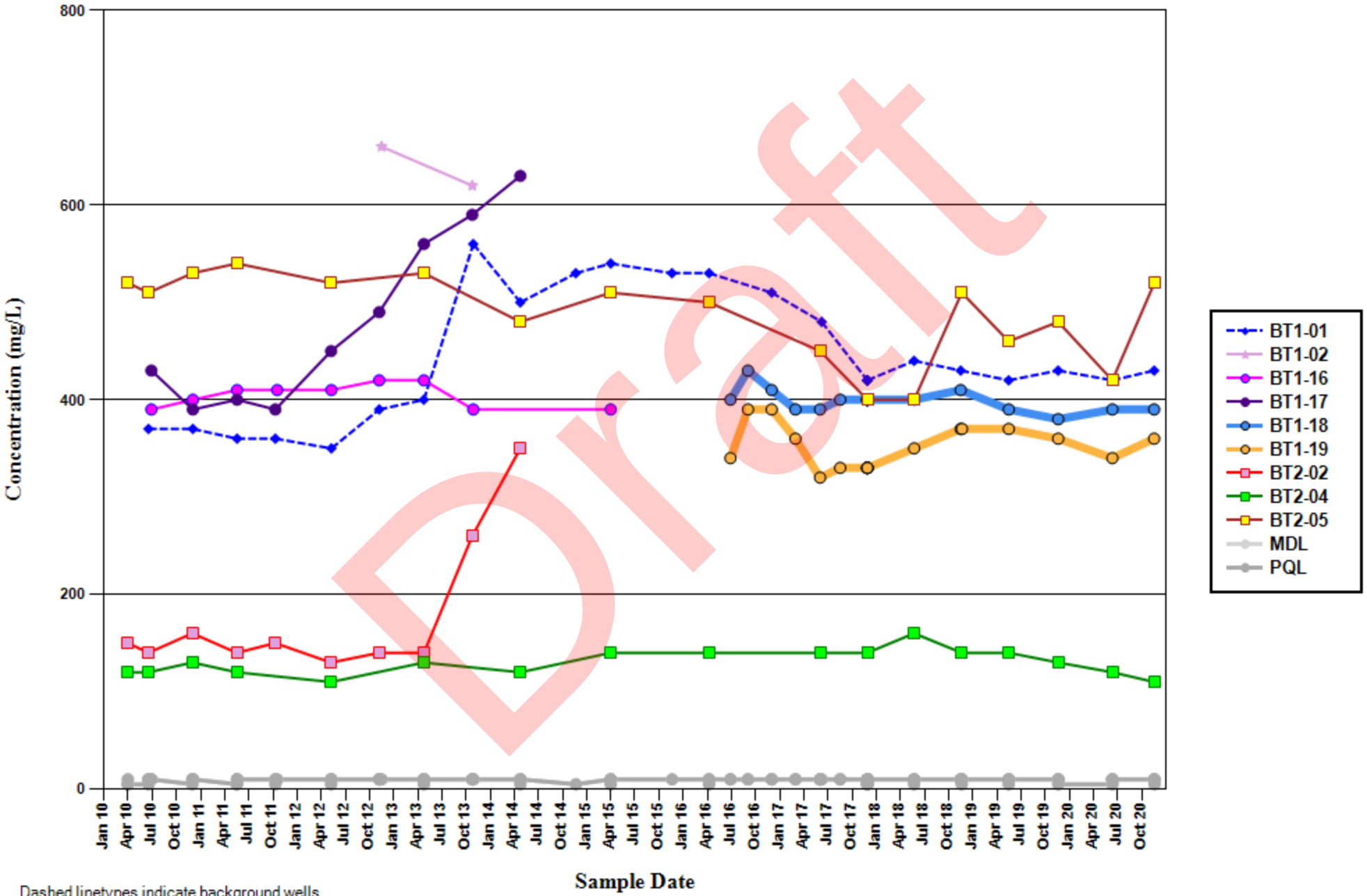
General Chemistry Monitoring Parameters

Buttonwillow Sanitary Landfill
General Chemistry
Alkalinity as CaCO3 (mg/L)



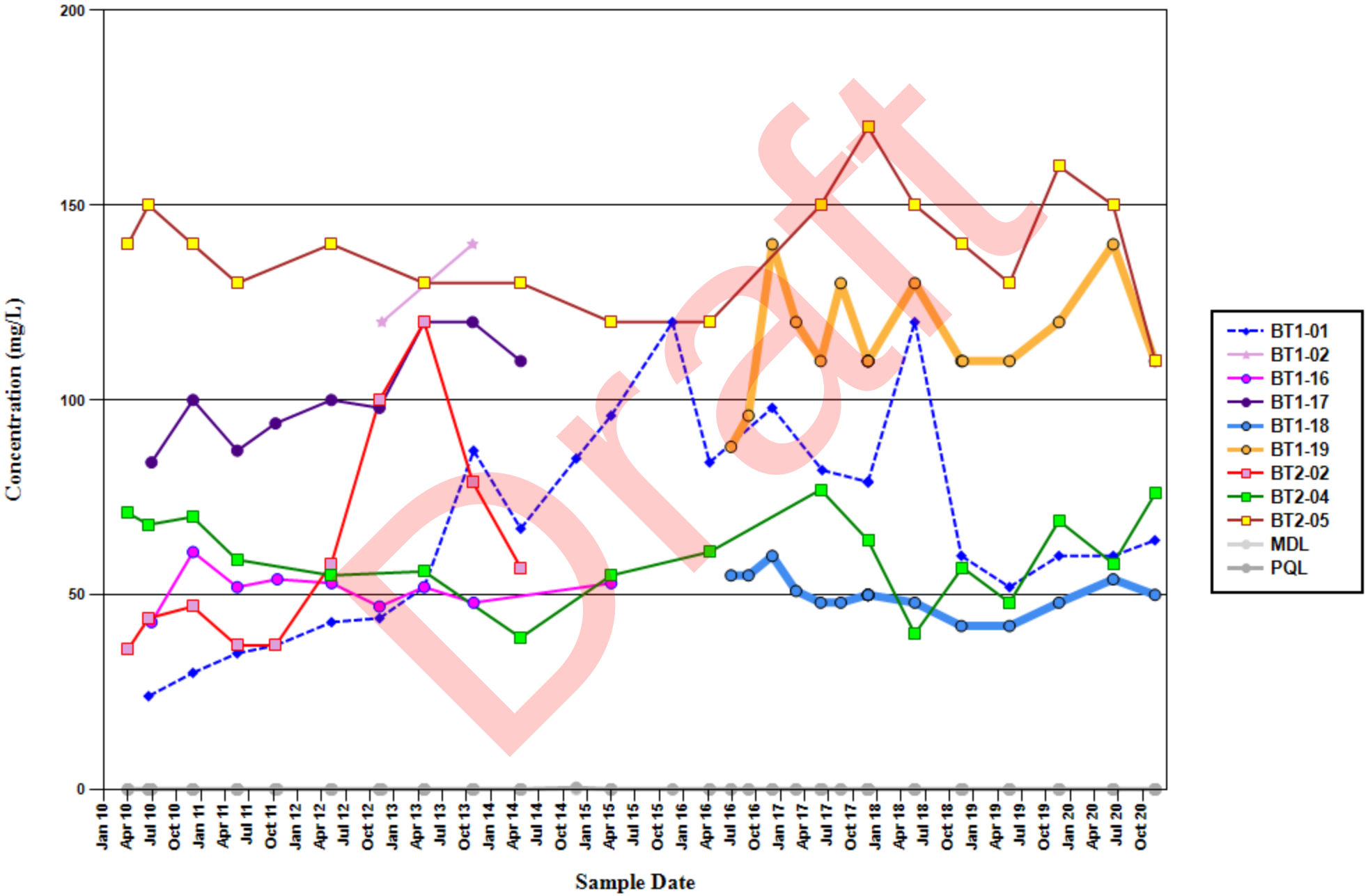
Dashed linetypes indicate background wells.
No MCL has been established for this constituent.
The PQL equals the MDL.

Buttonwillow Sanitary Landfill
General Chemistry
Bicarbonate as HCO3 (mg/L)



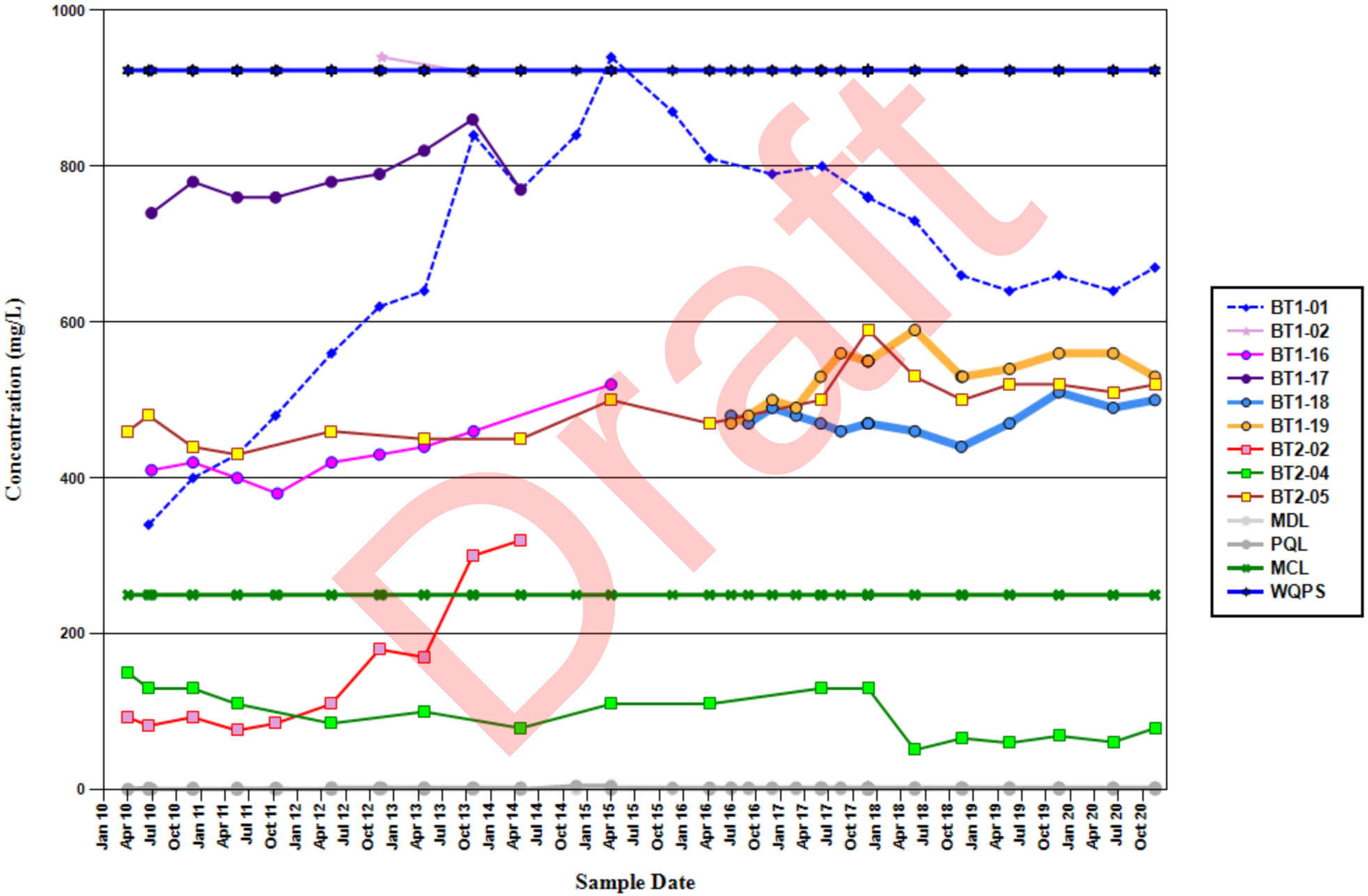
Dashed linetypes indicate background wells.
No MCL has been established for this constituent.
The PQL equals the MDL.

Buttonwillow Sanitary Landfill
General Chemistry
Calcium (mg/L)



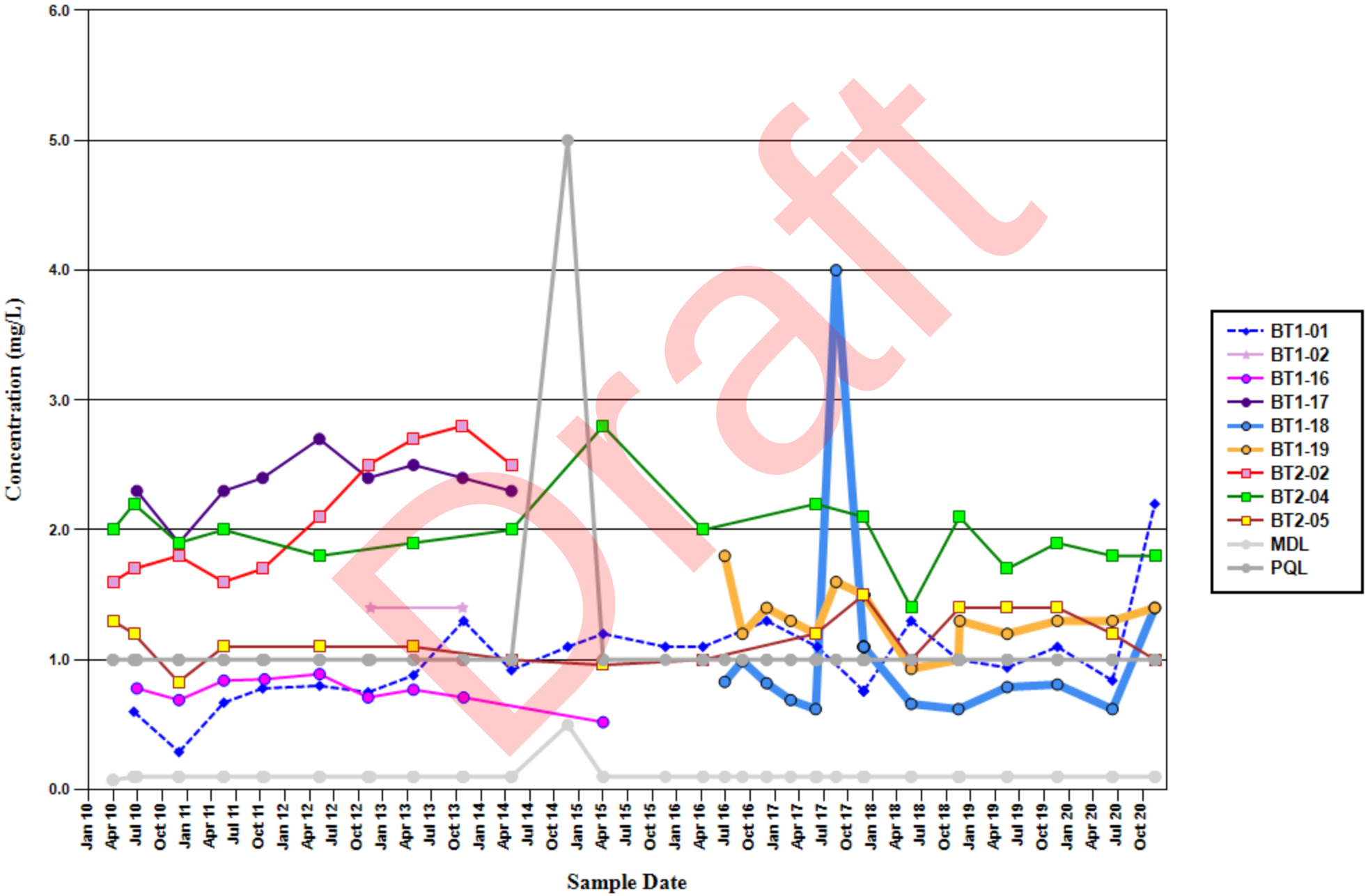
Dashed linetypes indicate background wells.
No MCL has been established for this constituent.

Buttonwillow Sanitary Landfill
General Chemistry
Chloride (mg/L)



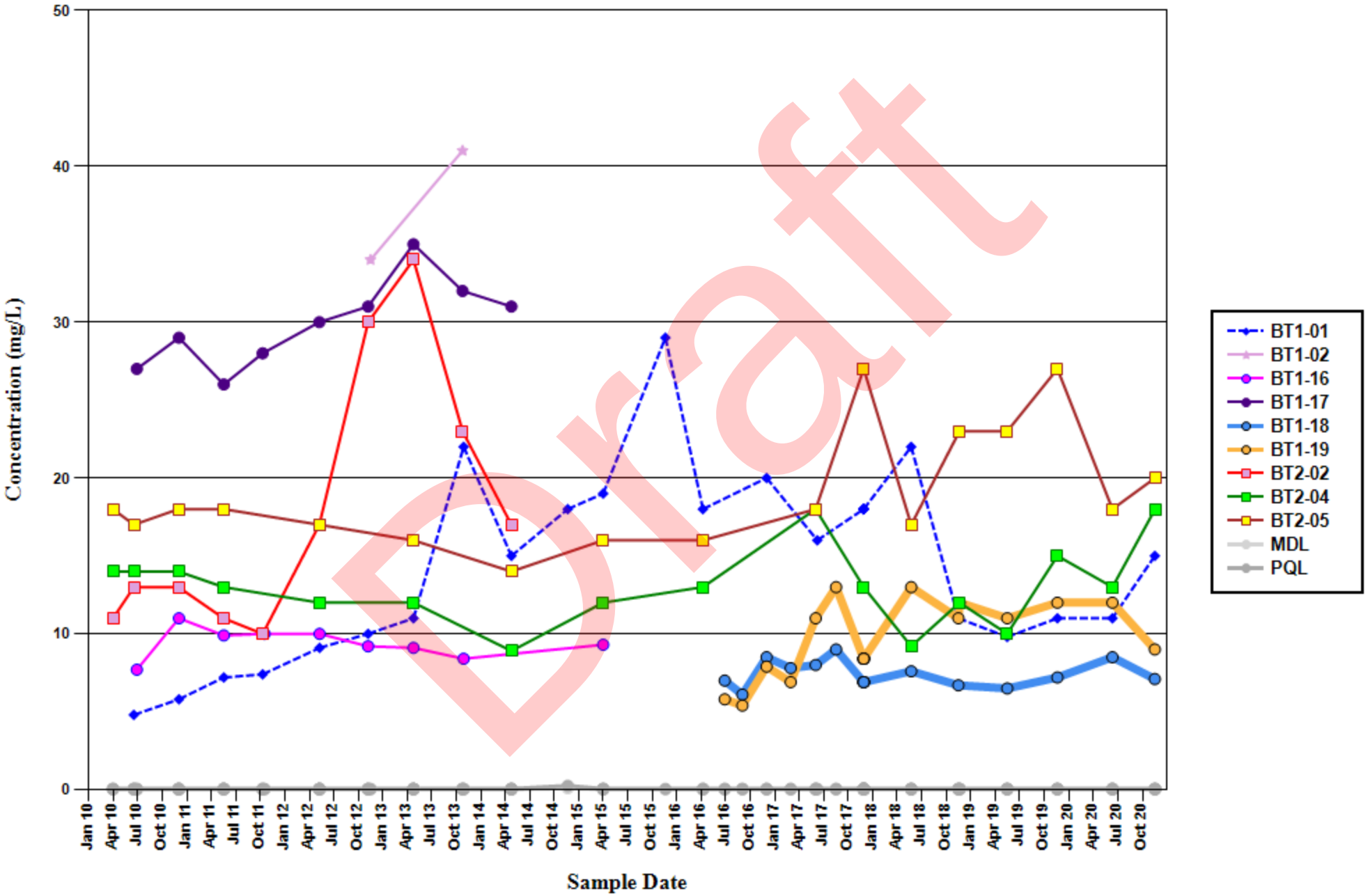
Dashed linetypes indicate background wells.
The MCL (250 mg/L), according to 'A Compilation of Water Quality Goals'.

Buttonwillow Sanitary Landfill
General Chemistry
Potassium (mg/L)



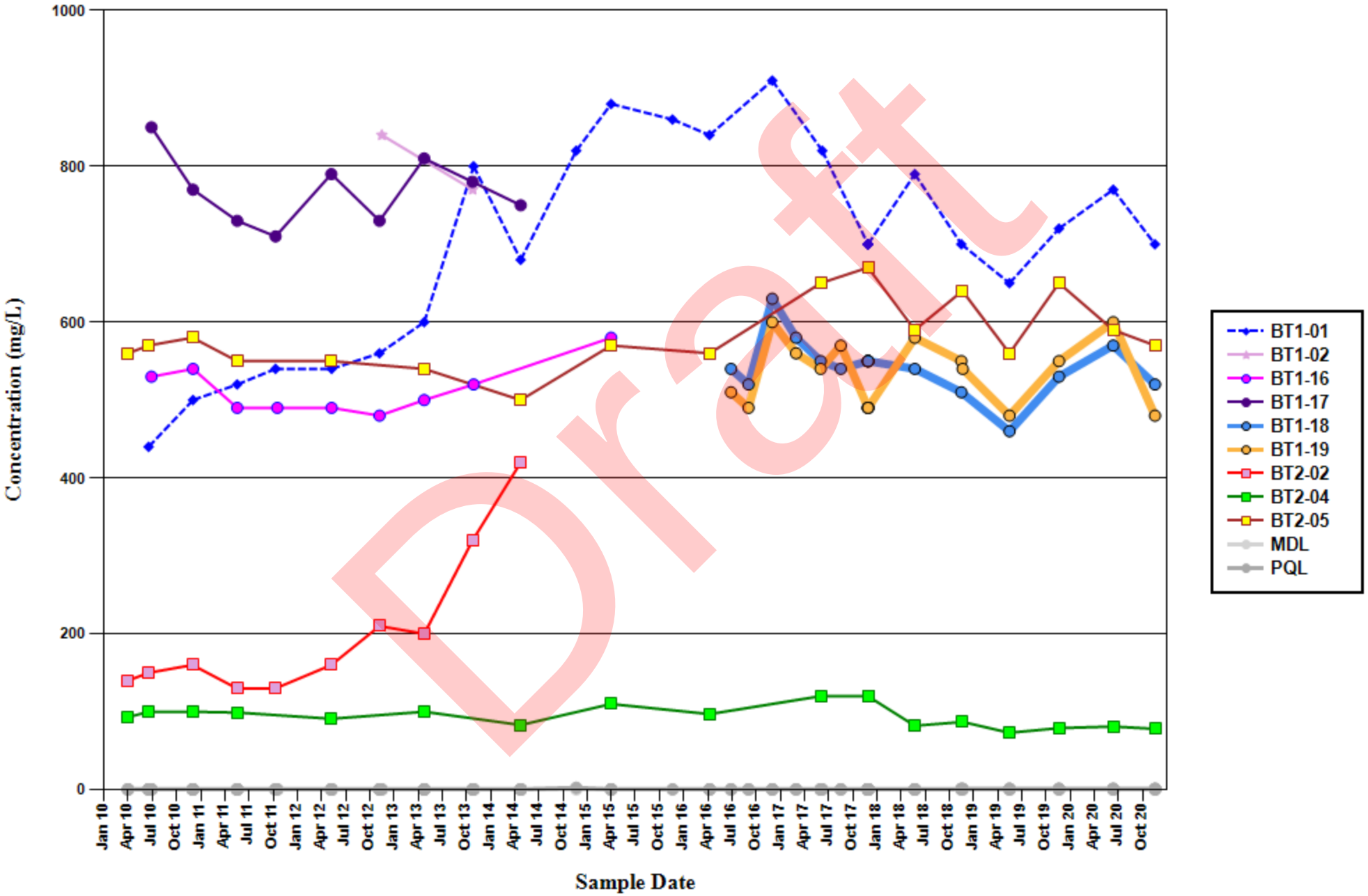
Dashed linetypes indicate background wells.
No MCL has been established for this constituent.

Buttonwillow Sanitary Landfill
General Chemistry
Magnesium (mg/L)



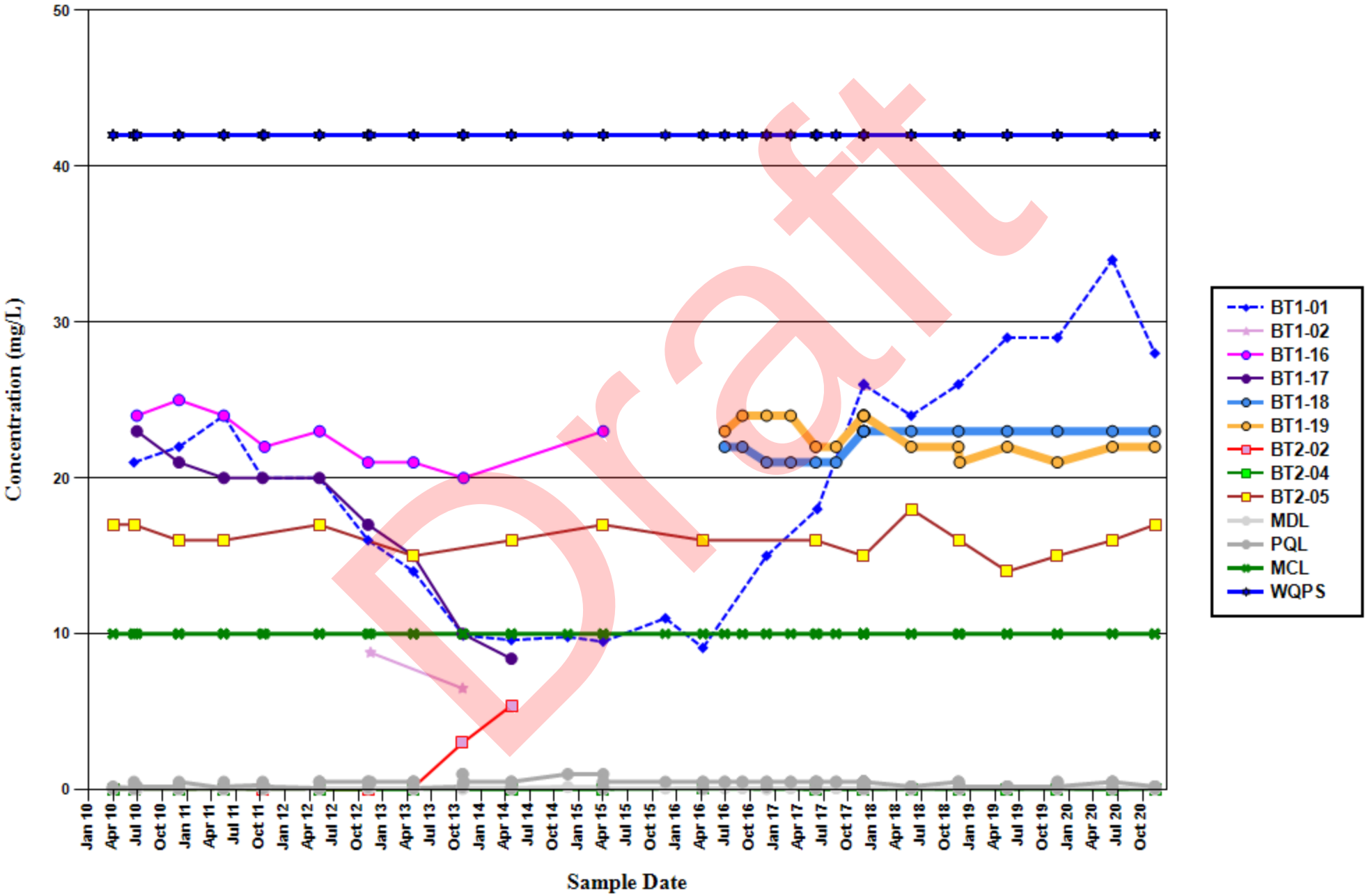
Dashed linetypes indicate background wells.
No MCL has been established for this constituent.

Buttonwillow Sanitary Landfill
General Chemistry
Sodium (mg/L)



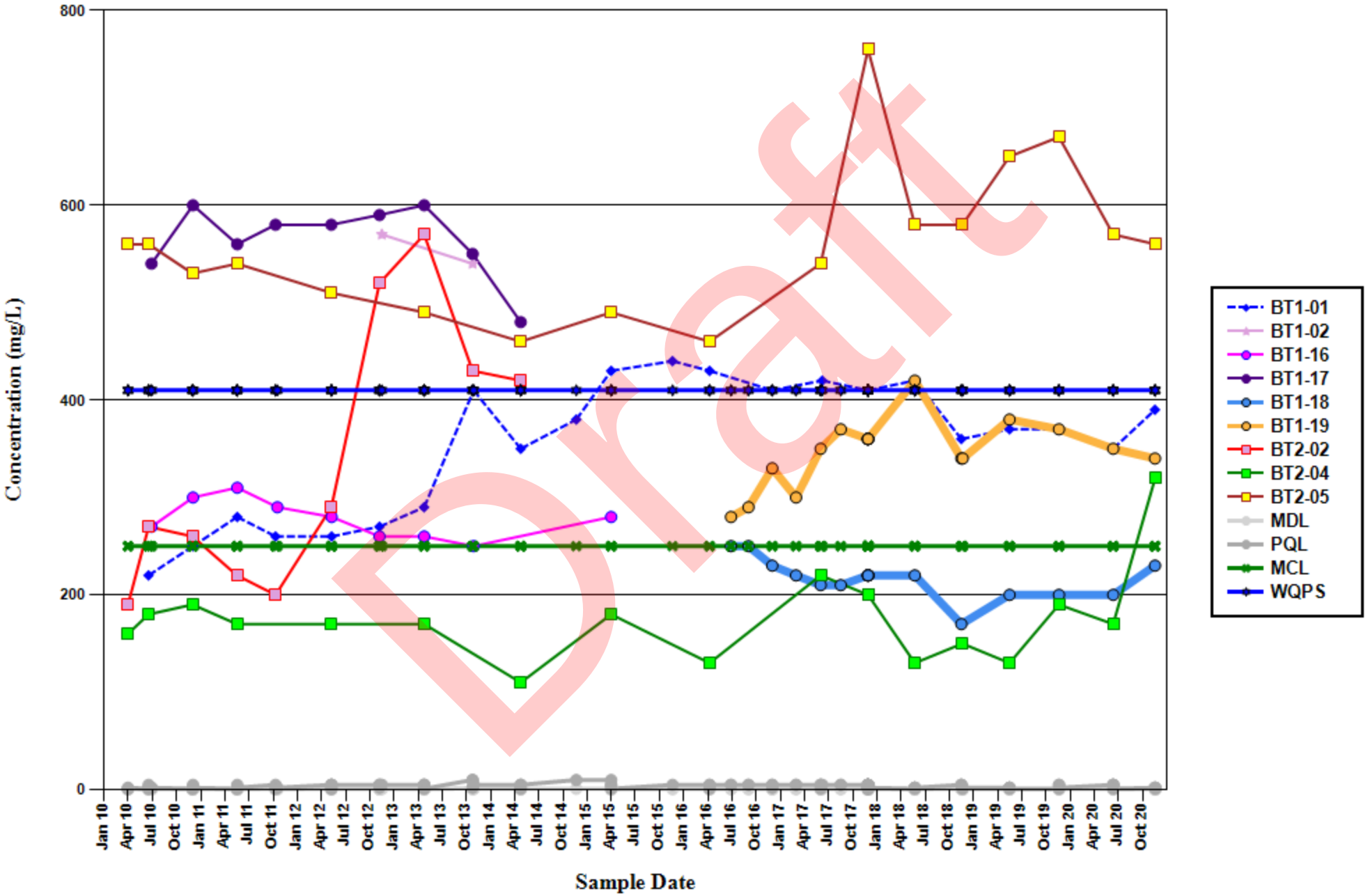
Dashed linetypes indicate background wells.
No MCL has been established for this constituent.

Buttonwillow Sanitary Landfill
General Chemistry
Nitrogen, Nitrate (as N) (mg/L)



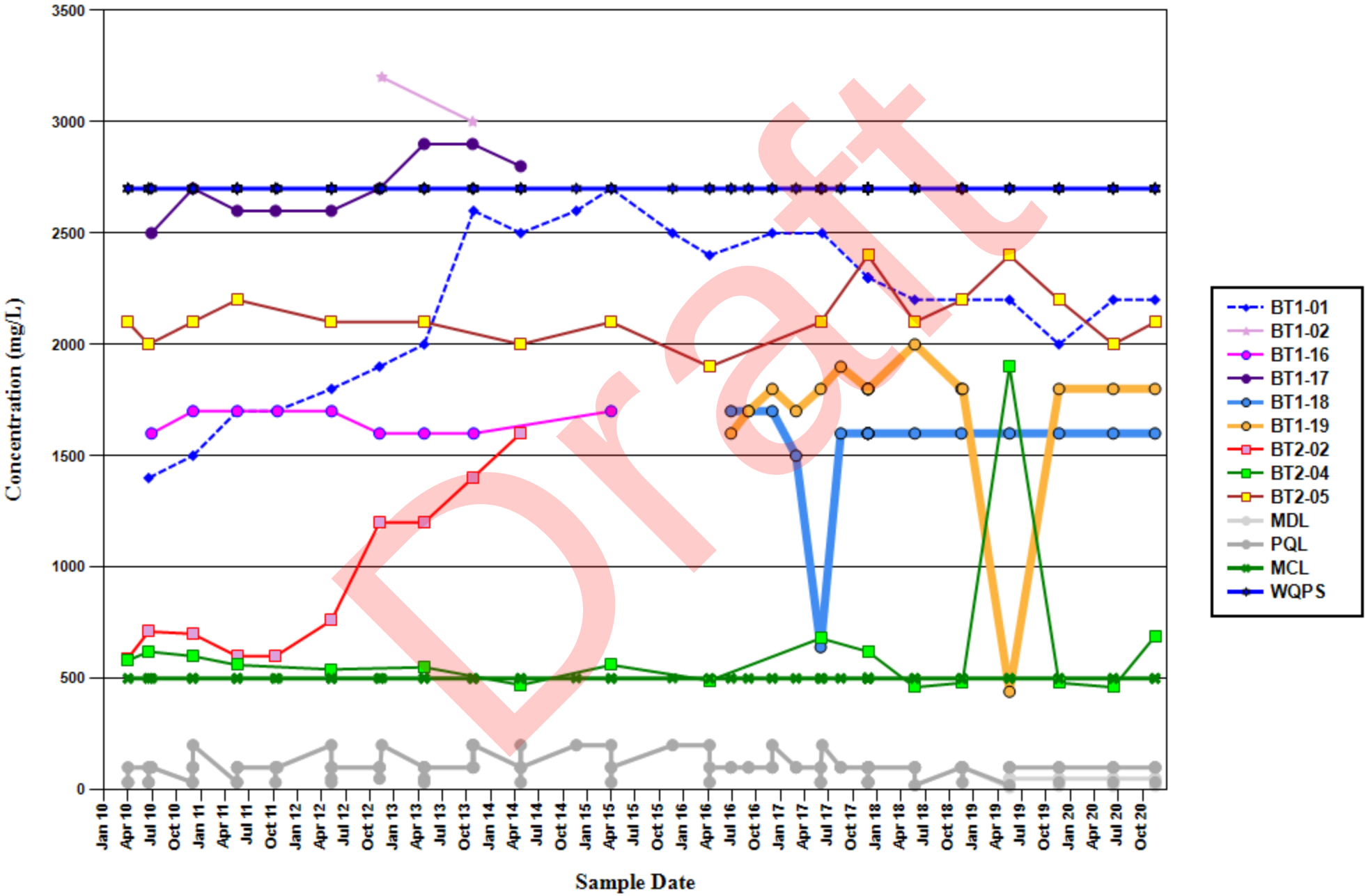
Dashed linetypes indicate background wells.
The MCL according to 'A Compilation of Water Quality Goals', SWRCB, 2011.

Buttonwillow Sanitary Landfill
General Chemistry
Sulfate (mg/L)



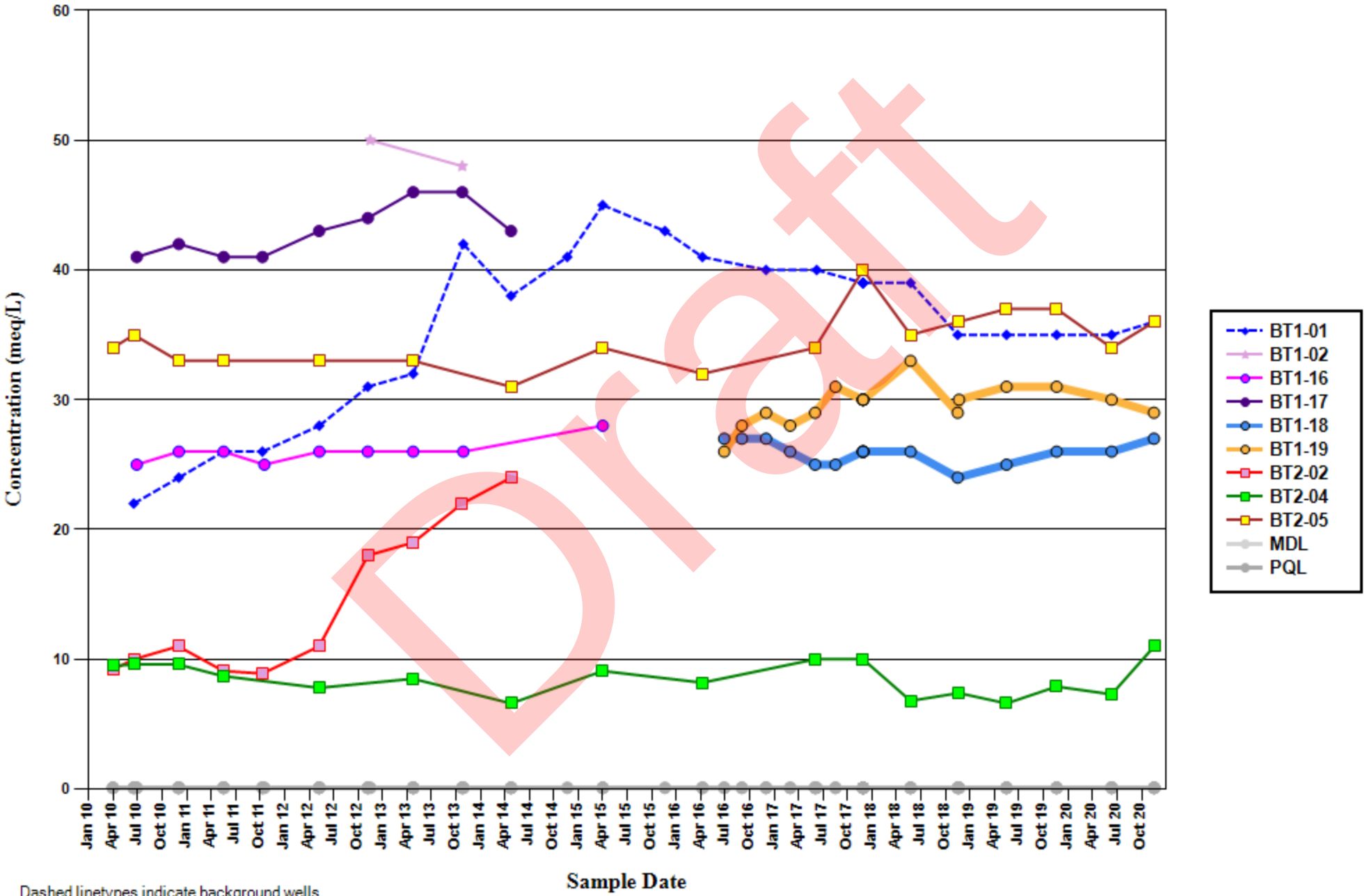
Dashed linetypes indicate background wells.
The MCL according to 'A Compilation of Water Quality Goals', 2011.

Buttonwillow Sanitary Landfill
General Chemistry
Total Dissolved Solids (mg/L)



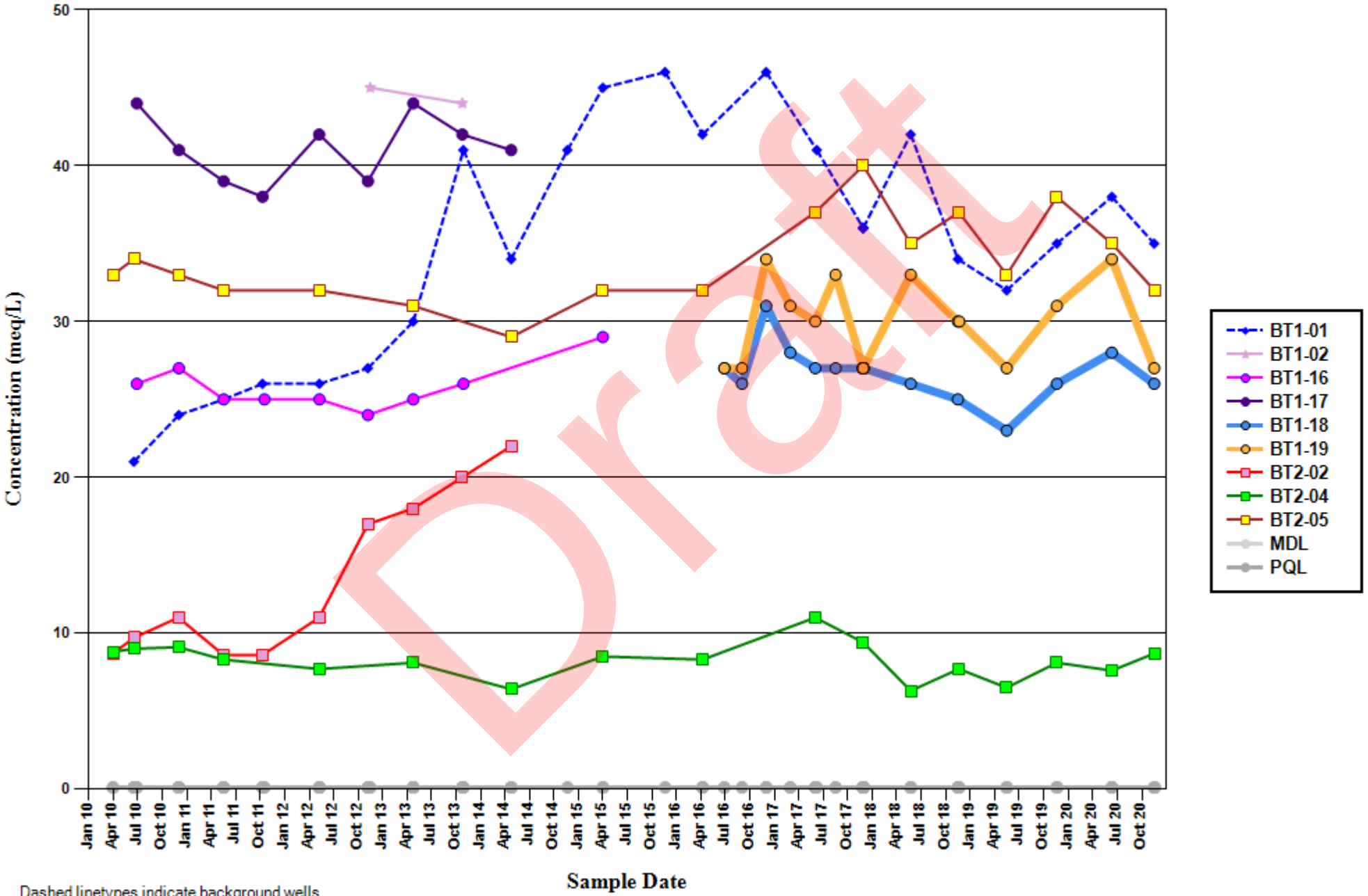
Dashed linetypes indicate background wells.
The MCL according to 'A Compilation of Water Quality Goals', 2011.

Buttonwillow Sanitary Landfill
General Chemistry
Total Anions (meq/L)



Dashed linetypes indicate background wells.
No MCL has been established for this constituent.
The PQL equals the MDL.

Buttonwillow Sanitary Landfill
General Chemistry
Total Cations (meq/L)



Dashed linetypes indicate background wells.
No MCL has been established for this constituent.
The PQL equals the MDL.

APPENDIX B.2

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GRAPHICAL PRESENTATION OF DATA

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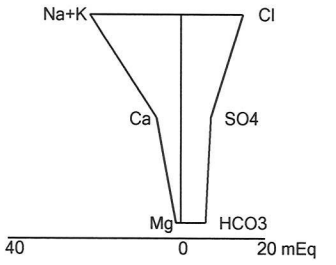
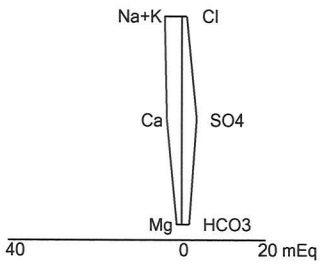
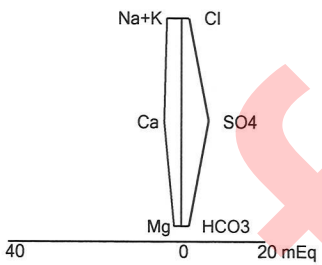
Stiff Diagrams



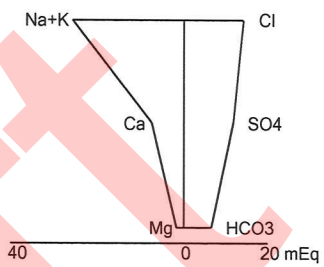
BT1-19 11/16/2020



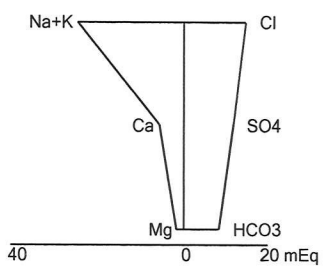
BT2-04 6/11/2020



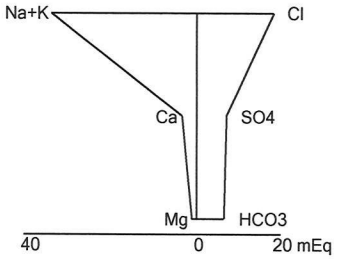
BT2-04 11/17/2020



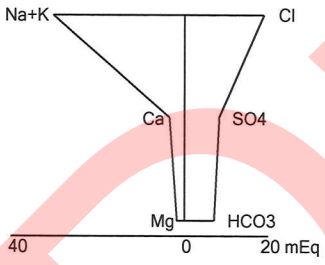
BT2-05 6/11/2020



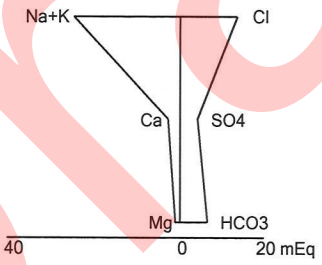
BT2-05 11/17/2020



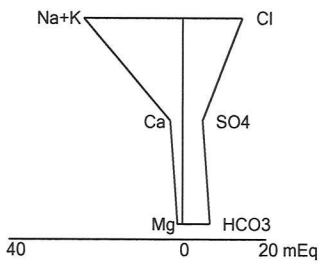
BT1-01* 6/11/2020



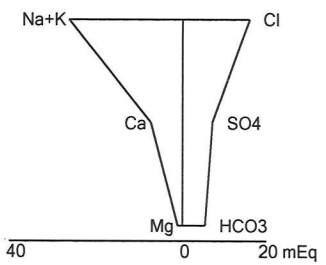
BT1-01* 11/16/2020



BT1-18 6/11/2020



BT1-18 11/16/2020



BT1-19 6/11/2020

Stiff Diagram Analysis Run 2/24/2021 8:23 AM

Buttonwillow Landfill Client: Kern County Data: BT_2020- Water Lab Results

APPENDIX C

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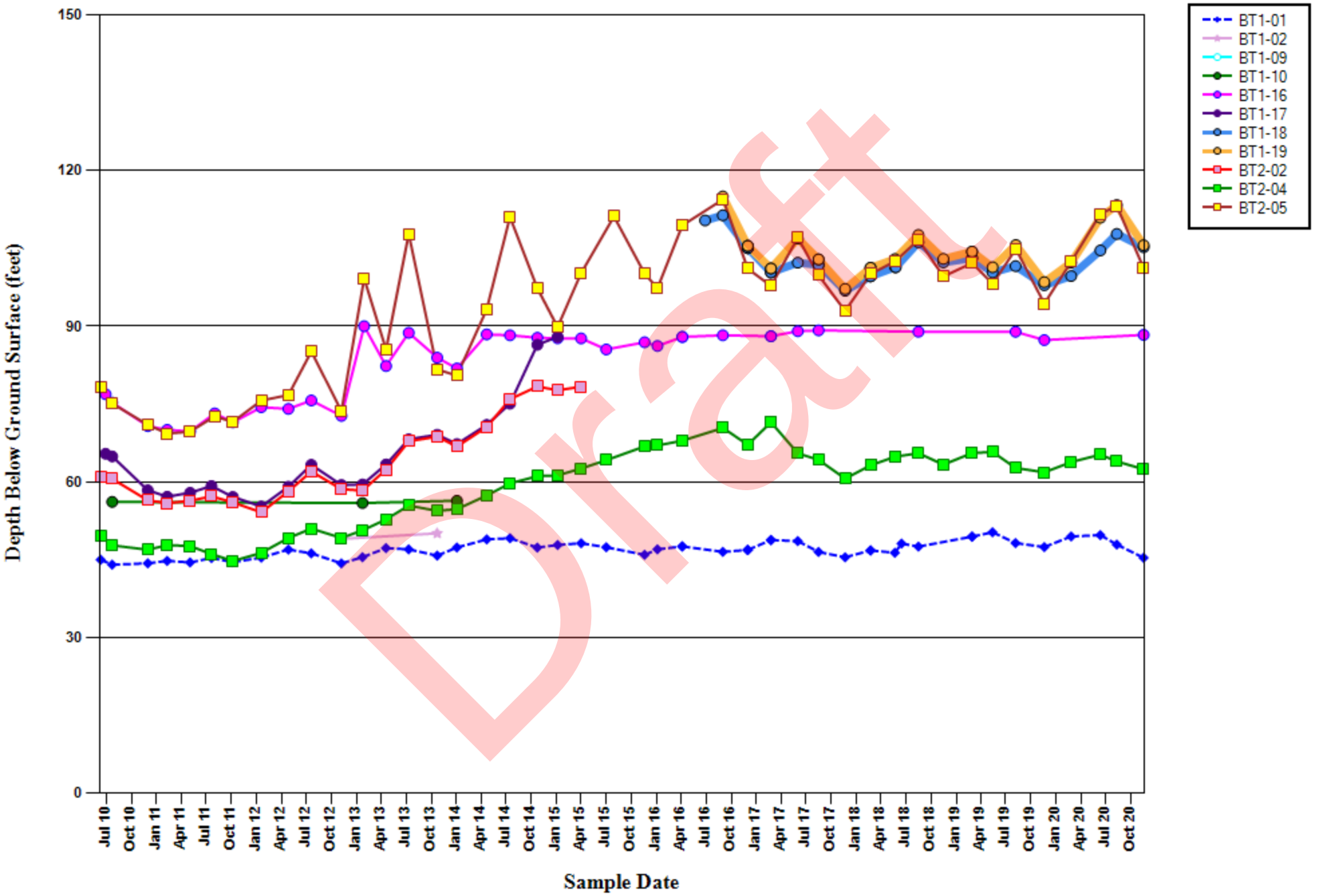
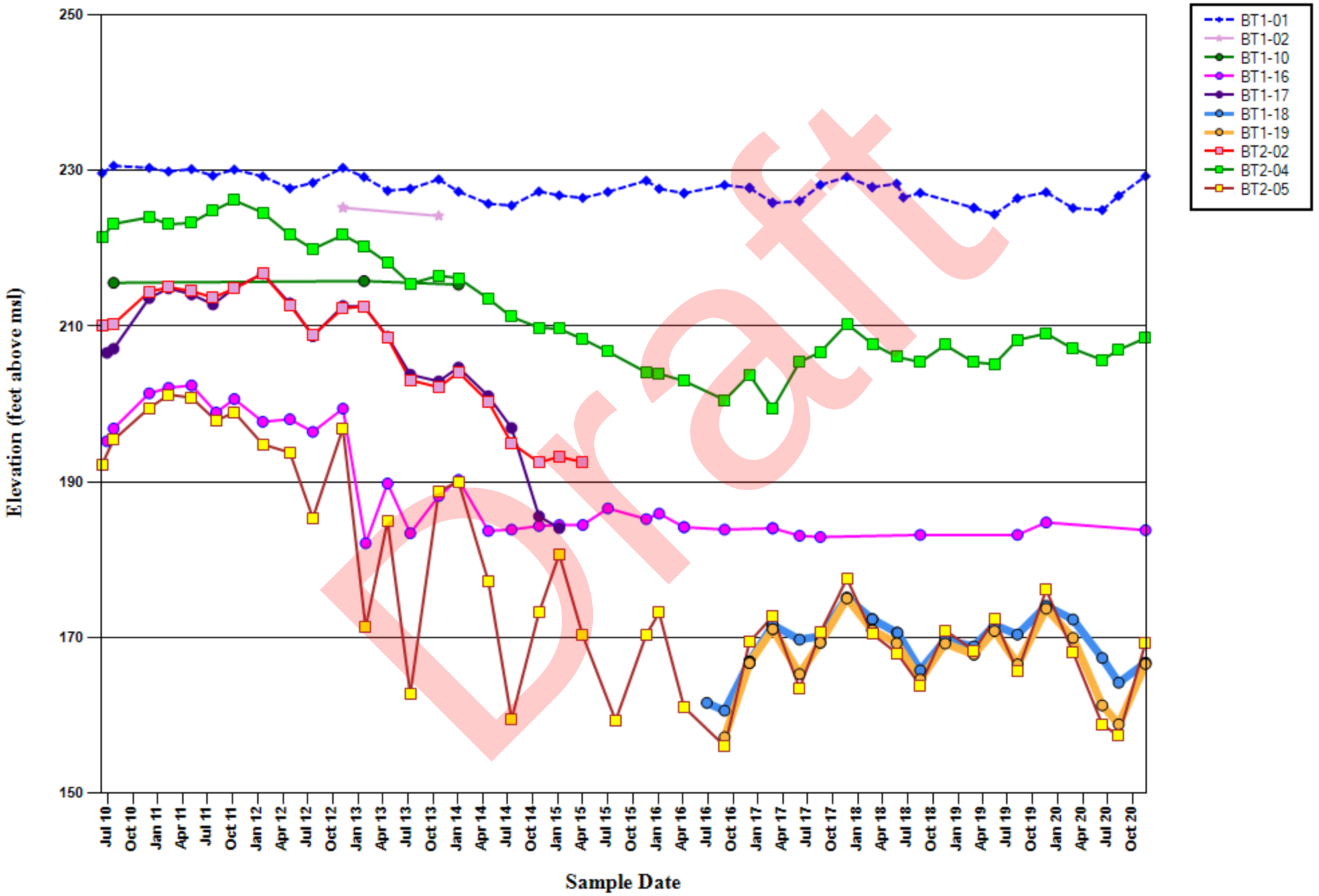
HYDROGRAPHS

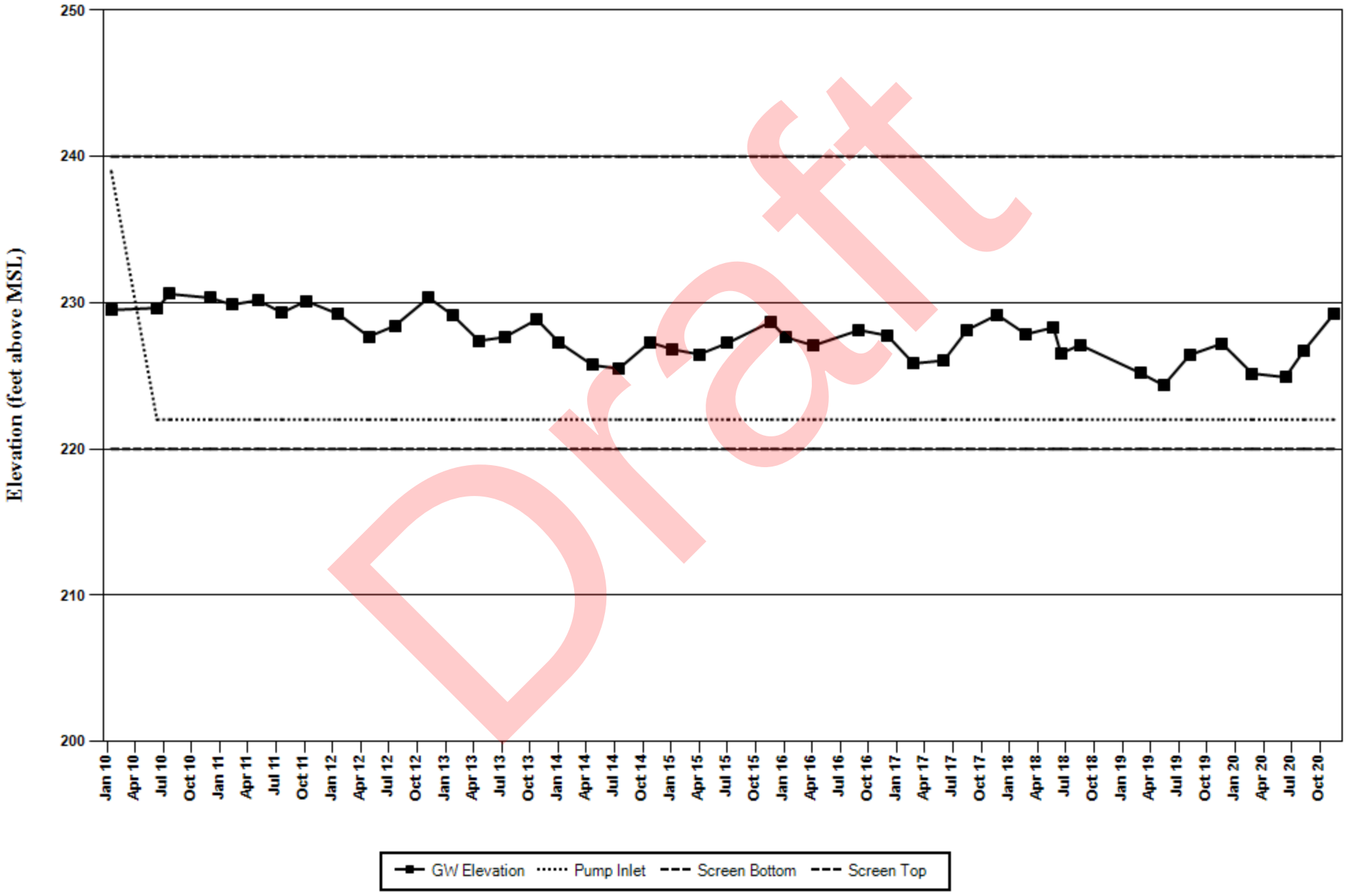
Buttonwillow Sanitary Landfill
Groundwater Depths



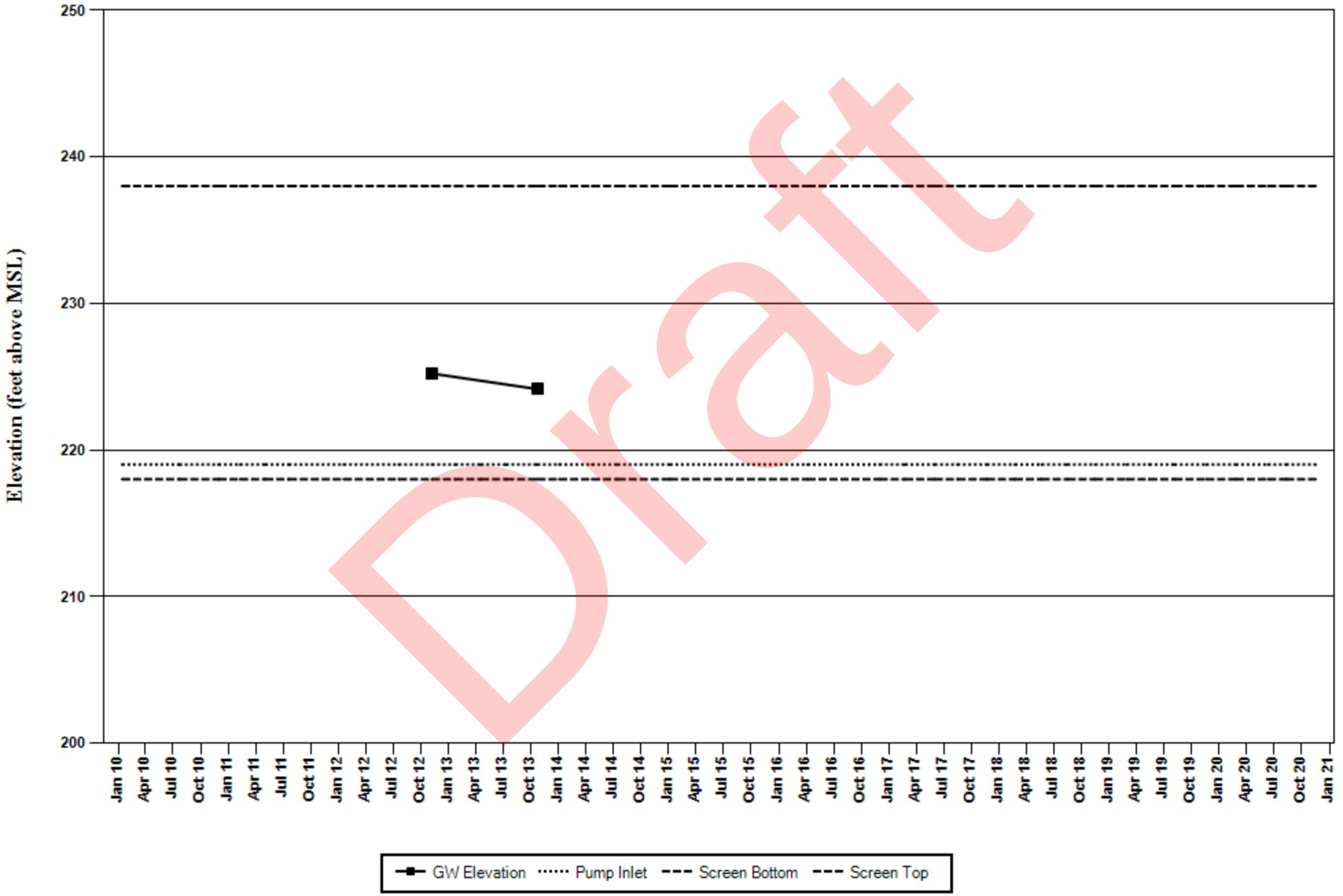
Buttonwillow Sanitary Landfill
Groundwater Elevations



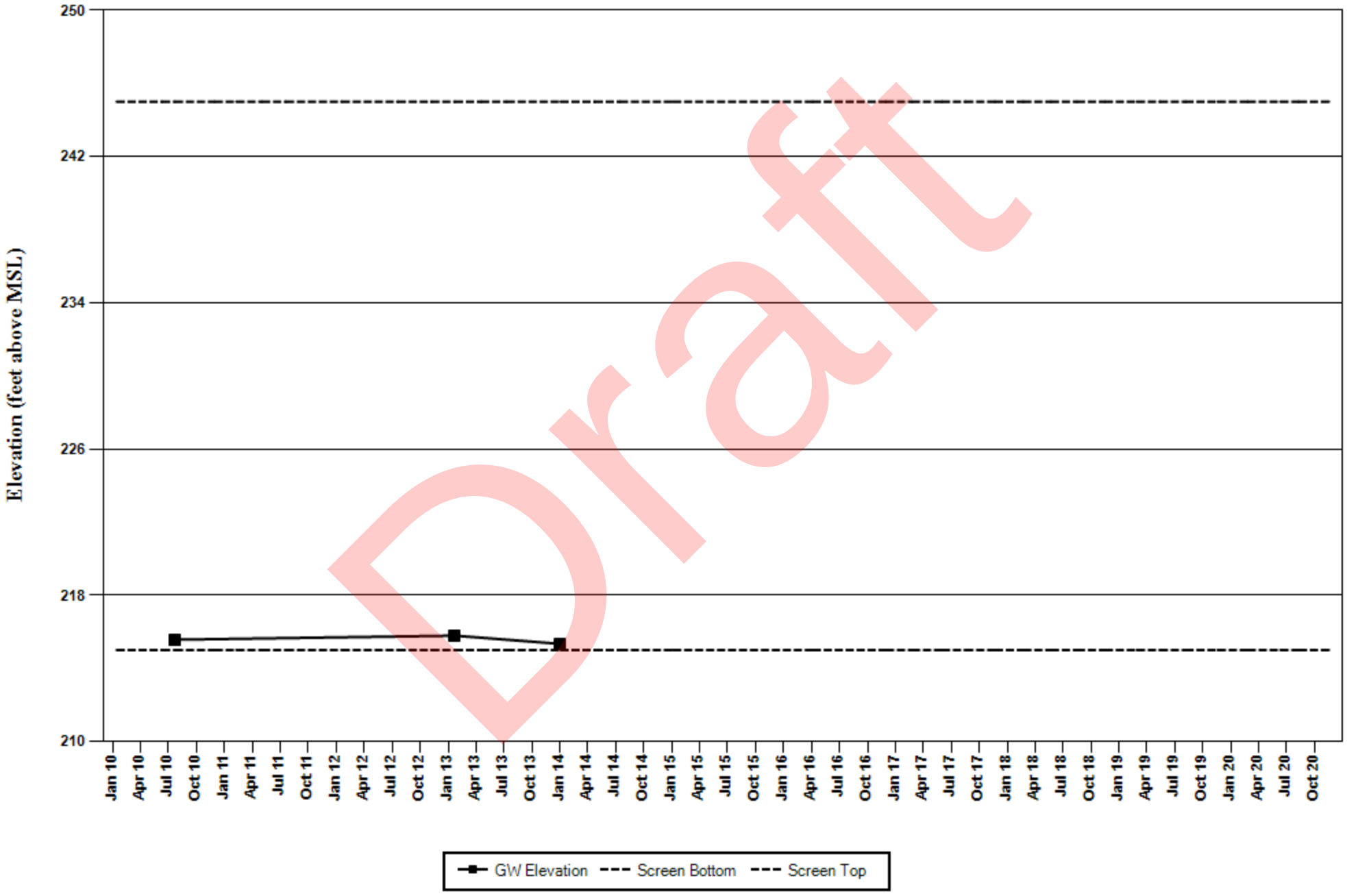
Buttonwillow Sanitary Landfill
Hydrographs
BT1-01



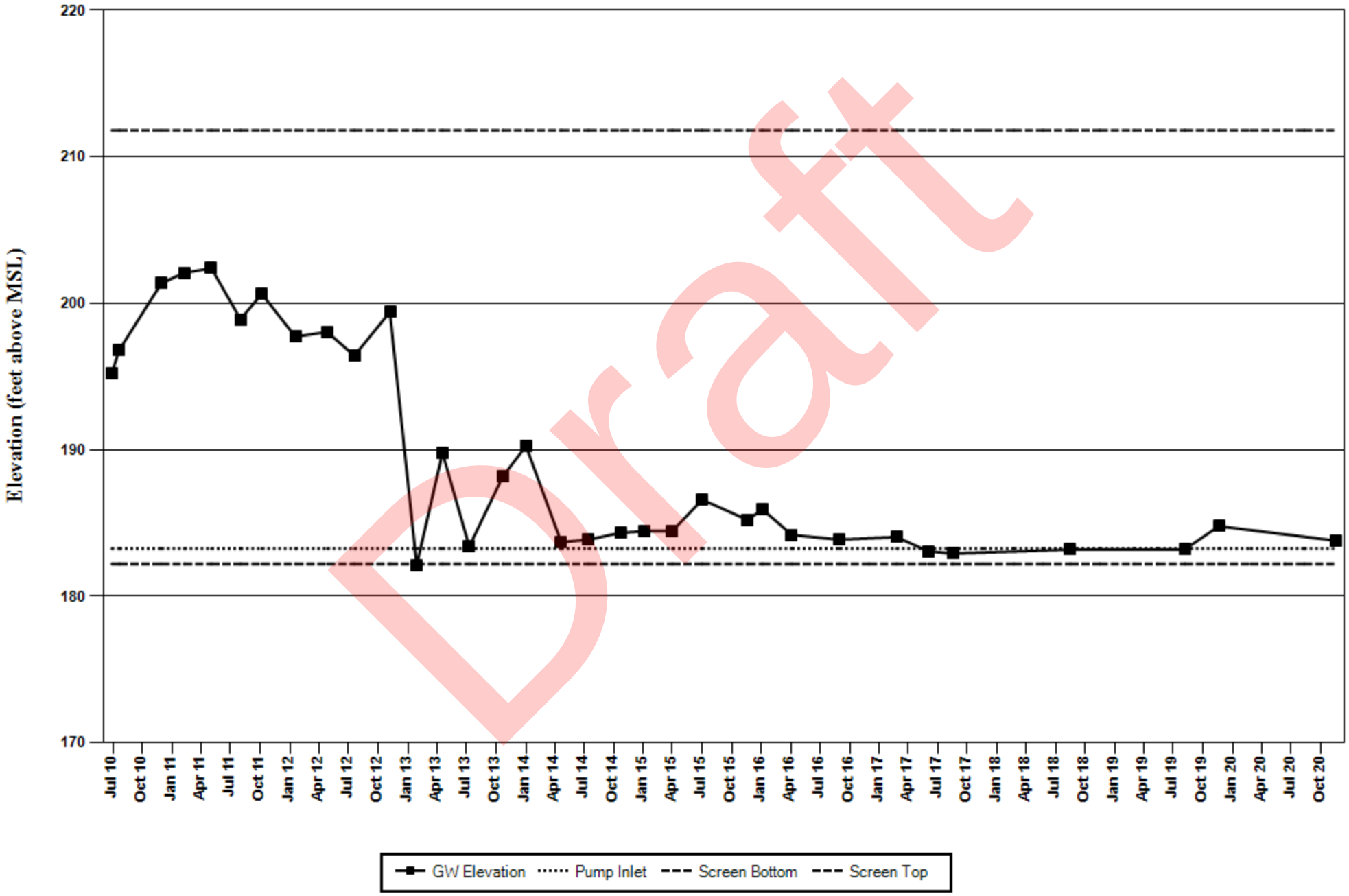
Buttonwillow Sanitary Landfill
Hydrographs
BT1-02



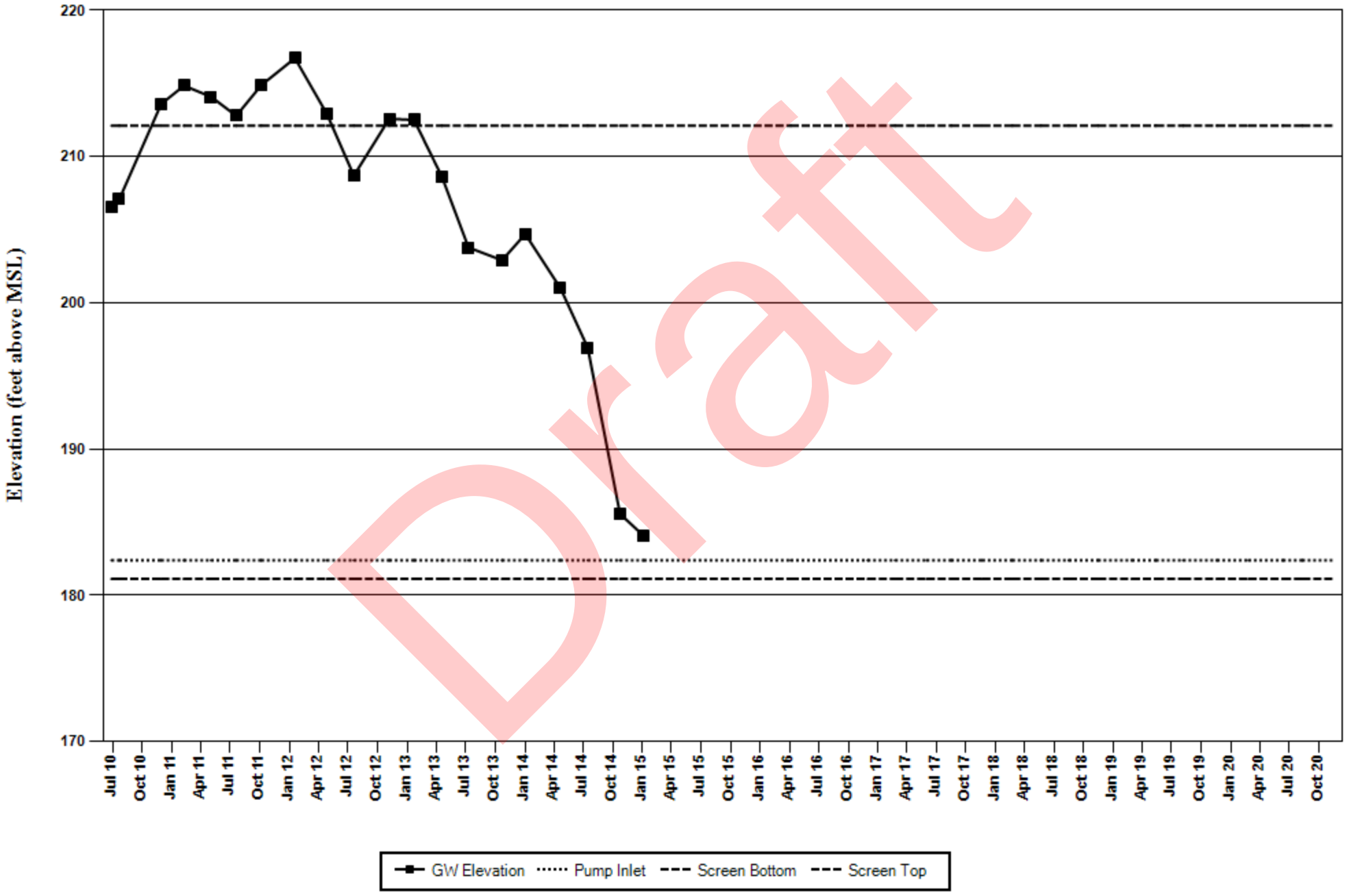
Buttonwillow Sanitary Landfill
Hydrographs
BT1-10



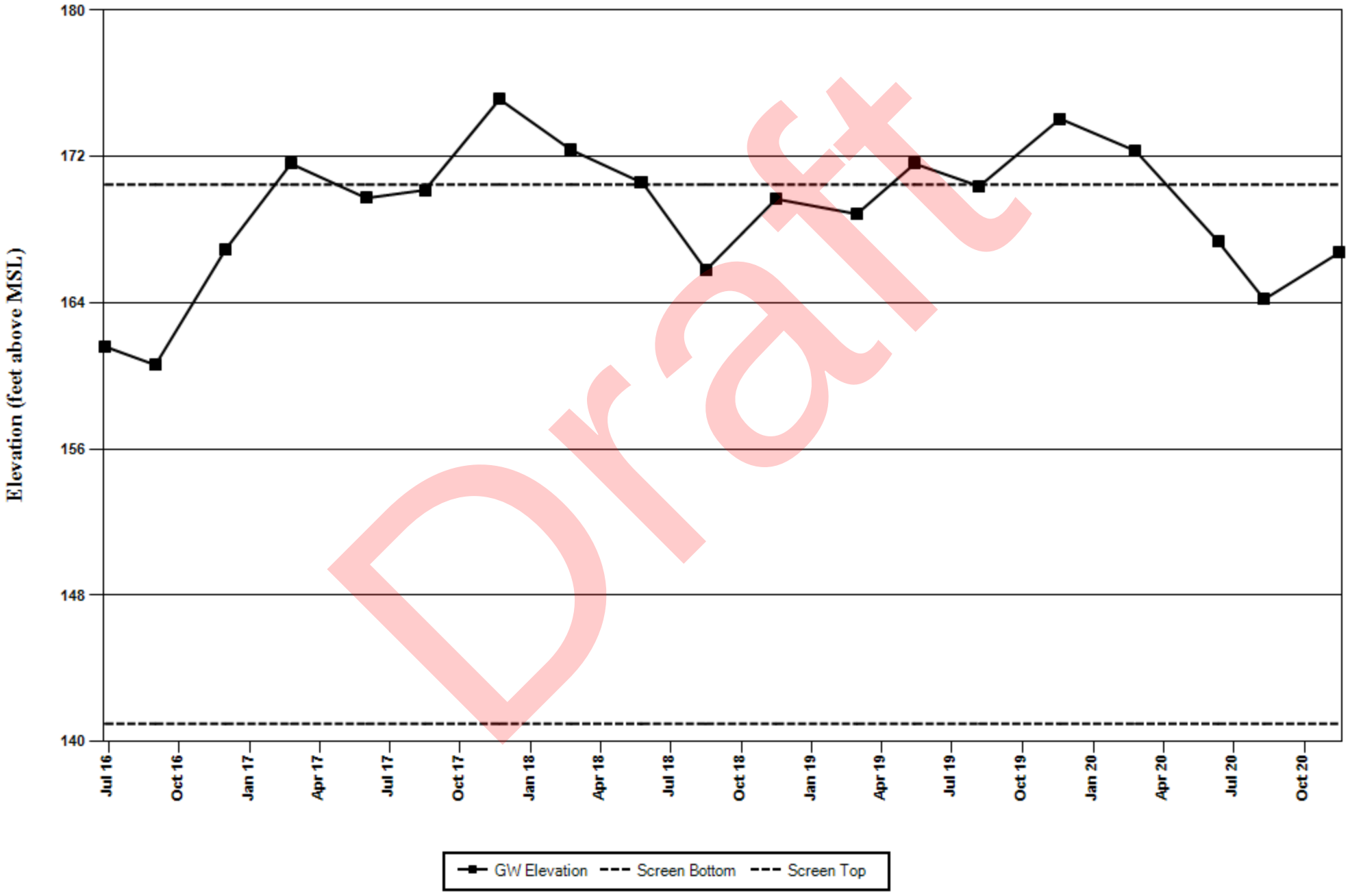
Buttonwillow Sanitary Landfill
Hydrographs
BT1-16



Buttonwillow Sanitary Landfill
Hydrographs
BT1-17



Buttonwillow Sanitary Landfill
Hydrographs
BT1-18



Buttonwillow Sanitary Landfill
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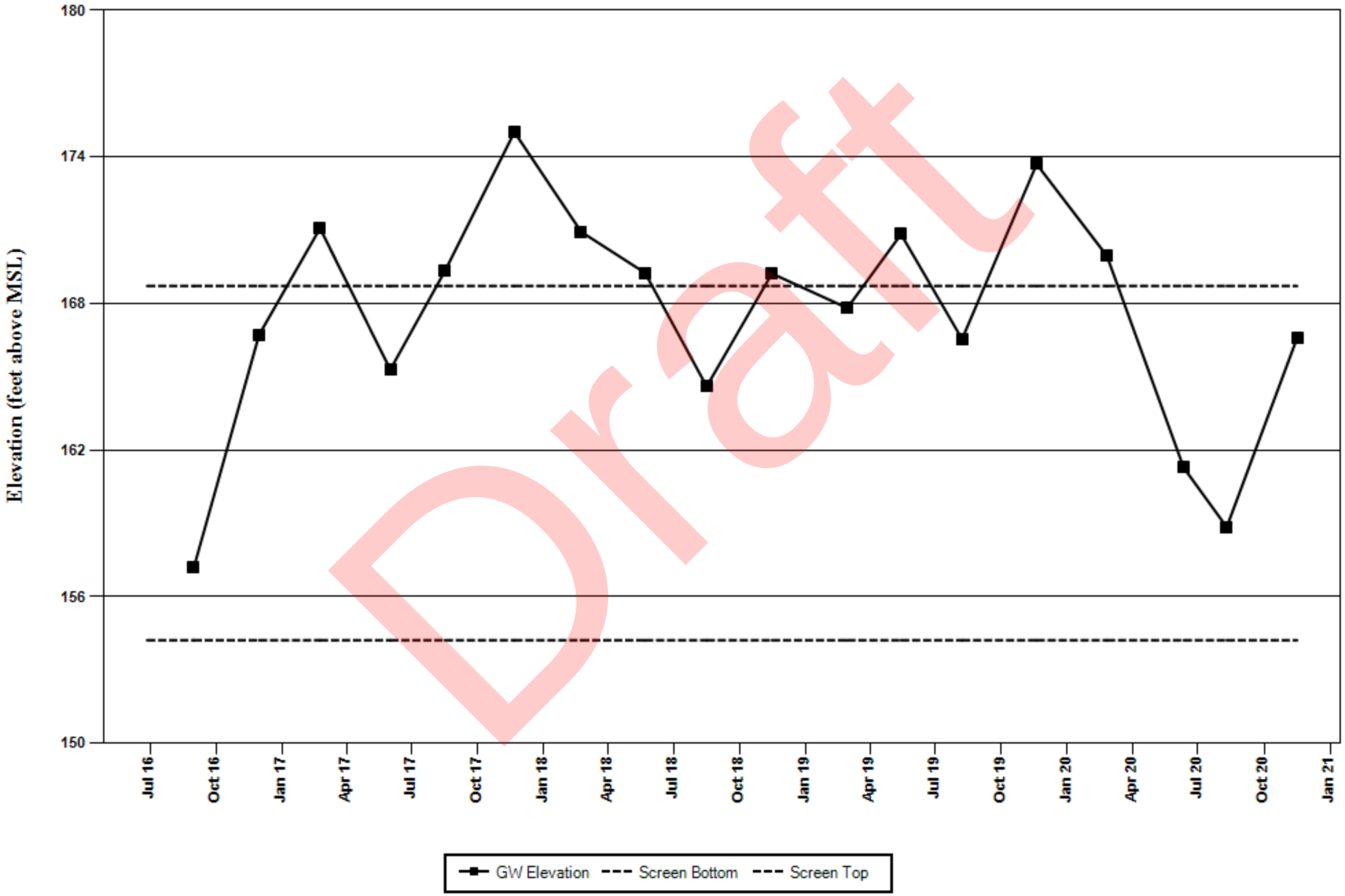
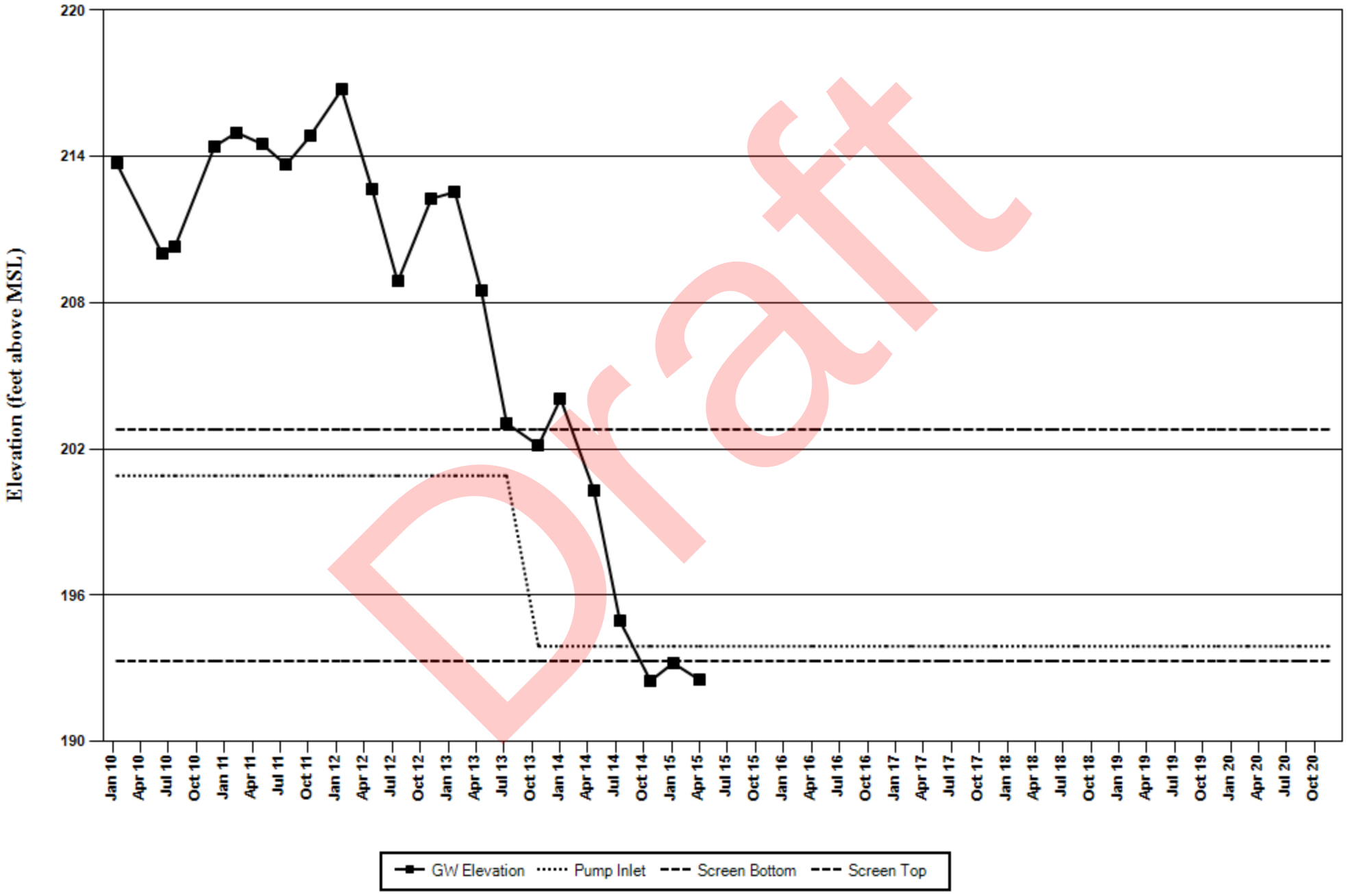
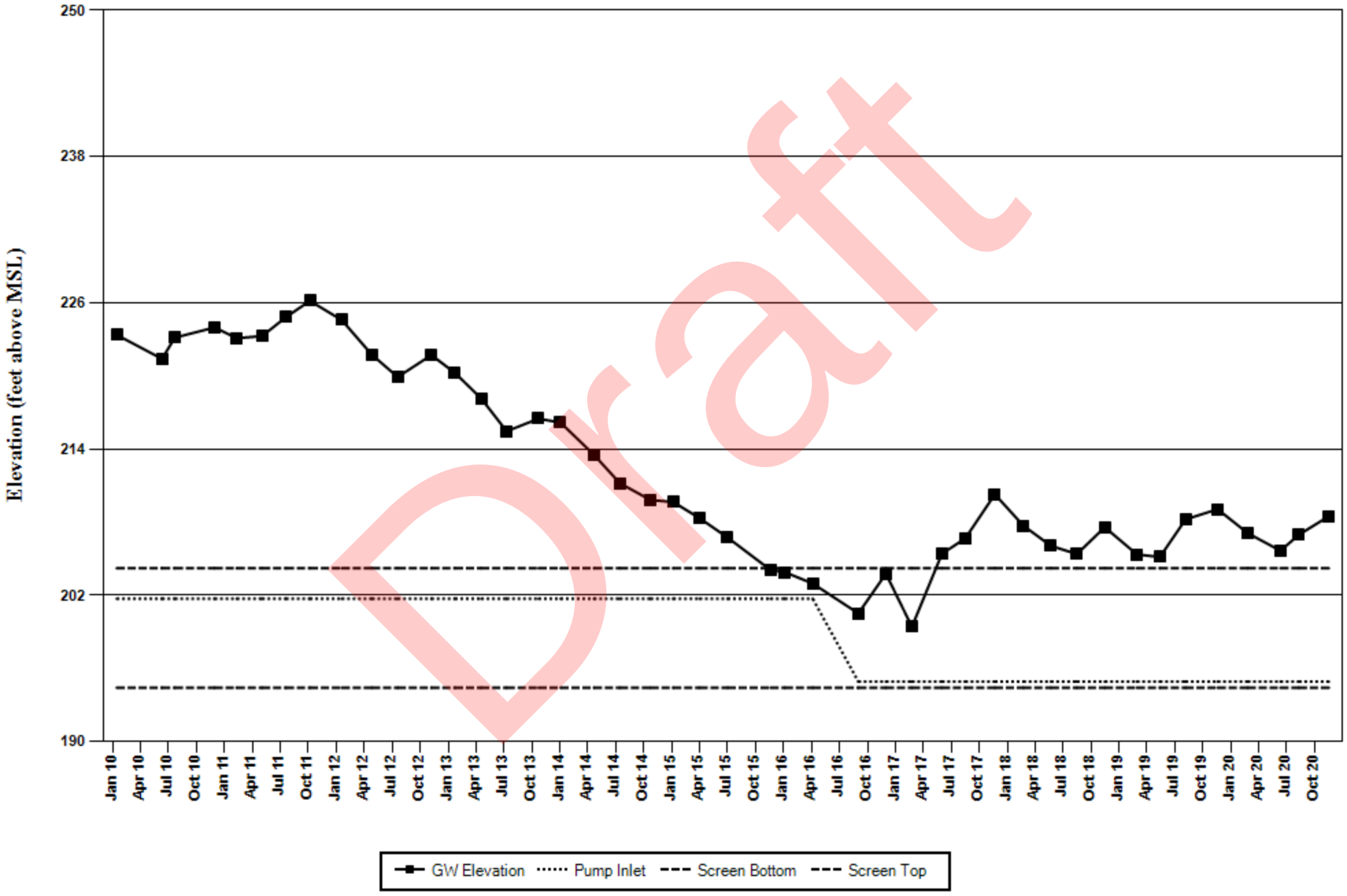
BT1-19



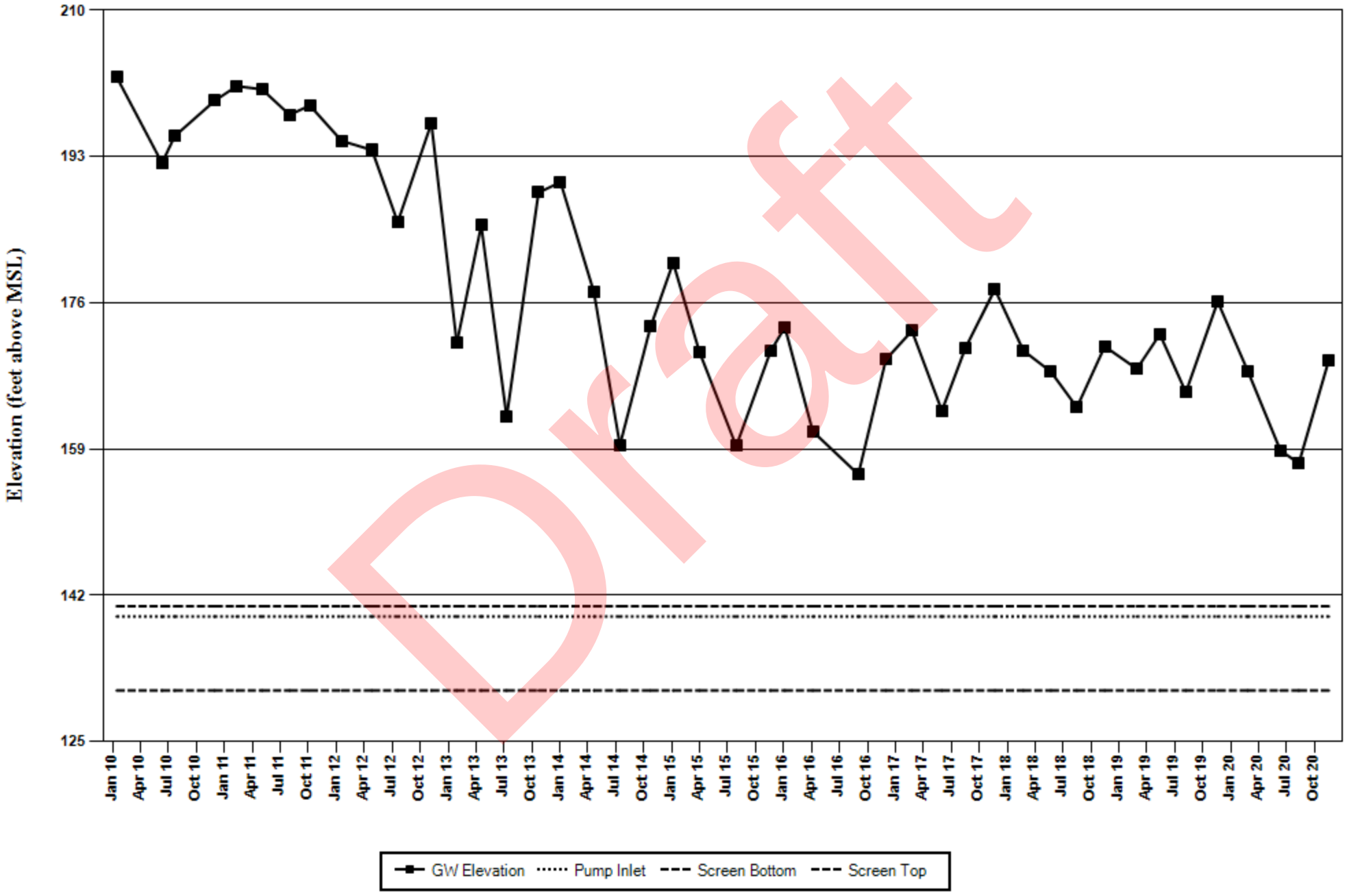
Buttonwillow Sanitary Landfill
Hydrographs
BT2-02



Buttonwillow Sanitary Landfill
Hydrographs
BT2-04



Buttonwillow Sanitary Landfill
Hydrographs
BT2-05



APPENDIX D

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FINANCIAL ASSURANCES

CRAIG M. POPE, P.E., DIRECTOR
ADMINISTRATION & HUMAN RESOURCES
FINANCE & ENGINEERING
BUILDING & CODE
OPERATIONS

KERN COUNTY
PUBLIC WORKS

2700 "M" STREET, Suite 400
BAKERSFIELD, CA 93301-2370
Phone: (661) 862-5000
FAX: (661) 862-8851
Toll Free: (800) 552-5376 Option 5
TTY Relay: (800) 735-2929

May 29, 2020

Transmitted Electronically

Mr. Richard Castle, Research Program Specialist
Department of Resources Recycling and Recovery
Financial Assurances, Mail Stop 10A-15
P.O. Box 4025
Sacramento, CA 95812-4025

SUBJECT: 2019 Annual Inflation Factor Report & Form 114

Dear Mr. Castle:

The Kern County Public Works Department (Department) respectfully submits the enclosed 2019 Annual Inflation Factor reports. In accordance with Title 27 California Code of Regulations (CCR) §22236, an "*operator shall submit, by June 1 of each year, a report calculating the increase in cost estimates for closure and/or postclosure maintenance and/or corrective action due to the inflation factor for the previous calendar year.*"

As required under Title 27 CCR §22233, CalRecycle Form 114 is included. Form 114 identifies the County of Kern's financial commitment, by means of a Pledge of Revenue, to meet the postclosure maintenance estimates (Resolution #94-167) and corrective action cost estimates (Resolution #2012-267) of solid waste facilities owned by the County of Kern and operated by the Department. Postclosure maintenance and corrective action cost estimates identified in resolution are subject to change based on ongoing calculations by the Department and third-party unit costs.

If you have any questions regarding the information presented, please feel free to contact Dave Lee at (661) 862-8765.

Sincerely,

Tony Bonanno
Public Works Manager

I:\CLERICAL\LETTERS\2020\20_05_18 DL_mm.docx
Attachments: Annual Inflation Reports & Certifications
cc: WMD-DRRR-COR; WMD-WQC

ANNUAL INFLATION FACTOR REPORT 2019

FACILITY NAME: **Buttonwillow Sanitary Landfill**

FACILITY NO.: **15-AA-0047**

1.) Identify the highest approved or subsequently submitted cost estimate on record and the date of the plan:

$ 312,650	April 2003
Highest Closure Cost Estimate Approved or Subsequently Submitted	Date of Plan
$ 980,322	December 2019
Highest Postclosure Maintenance Cost Estimate Approved or Subsequently Submitted	Date of Plan
$ 346,150	May 2003
Highest Corrective Action Cost Estimate Approved or Subsequently Submitted	Date of Plan

2.) Multiply each cost estimate by the inflation factor to determine the new adjusted cost estimates as illustrated below:

The ABC Landfill's cost estimate for CLOSURE in 2019 was $2,000,000. Using the 2019 inflation factor of 1.018, they recalculated their ADJUSTED CLOSURE COST for 2020 to $2,036,000. Their POSTCLOSURE MAINTENANCE (PCM) COST with a Multiplier of 30 in 2019 was $1,500,000. Using the 2019 inflation factor of 1.018, their ADJUSTED PCM COST for 2020 is $1,527,000. Their cost estimate for CORRECTIVE ACTION in 2019 was $1,000,000. Using the 2019 inflation factor of 1.018, they recalculated their ADJUSTED CORRECTIVE ACTION COST for 2020 to $1,018,000.

NOTE: If the cost estimates identified above were prepared in 2020 dollars, do not inflate below.

ANNUAL INFLATION FACTOR REPORT 2019

$ N/A Closure Costs (2019 Dollars)	x 1.018 =	$ N/A Estimate in 2020 Dollars
$ 980,322 Annual PCM Costs x PCM Multiplier of 30 or other approved PCM Multiplier (2019 Dollars)	x 1.018 =	$ 997,968 Estimate in 2020 Dollars
$ 464,920 Corrective Action Costs (2019 Dollars)	x 1.018 =	$ 473,288 Estimate in 2020 Dollars

Choose Either:
Water [X]
or Non-Water [ ]

I certify under penalty of perjury under the laws of the State of California that the information in this document is true and correct to the best of my knowledge and is being provided in accordance with the regulations. To sign, click the "Fill & Sign" button on the right pane. Click "Sign" at the top and click "Add Signature".

Operator/Owner Signature

Craig M. Pope
Printed Name of Person Signing

2700 'M' Street, Suite 450
Bakersfield, CA 93301
Mailing Address

Director, Kern County Public Works
Title of Person Signing

(661) 862-8900
Phone Number

solidwaste@kerncounty.com
Email

May 29, 2020
Date of Report

PLEDGE OF REVENUE REQUIREMENTS

NOTE: This form is the transmittal sheet for documents required to be submitted to CalRecycle for a Pledge of Revenue as specified in Title 27, California Code of Regulations, Division 2, Subdivision 1, Chapter 6. Please refer to the instructions for definitions of terms and for completing this form.

Part 1. OWNER/OPERATOR ESTABLISHING PLEDGE OF REVENUE

Check one box only

☒ OWNER ☐ OPERATOR

OWNER/OPERATOR NAME (Type or Print)	NAME OF CONTACT FOR PLEDGE OF REVENUE (Type or Print)
County of Kern (Public Works Department)	Samuel Lux
ADDRESS, CITY, STATE, ZIP	ADDRESS, CITY, STATE, ZIP
2700 M St., Ste. 450 Bakersfield, CA 93301	2700 M St., Ste. 450 Bakersfield, CA 93301
TELEPHONE #: (661) 862-8900	TELEPHONE #: (661) 862-8858
FAX #: (661) 862-8905	FAX #: (661) 862-8905
E-MAIL ADDRESS: solidwaste@kerncounty.com	E-MAIL ADDRESS: luxs@kerncounty.com

Part 2. PLEDGE OF REVENUE

PLEDGE OF REVENUE AGREEMENT FOR: (Check applicable boxes):	ANNUAL PLEDGED REVENUE
☒ 1. POSTCLOSURE MAINTENANCE COSTS	$ (See Attached List)
☐ 2. CORRECTIVE ACTION COSTS	$
☐ 3. BOTH (COMBINED COSTS AS WELL AS COSTS IDENTIFIED ABOVE)	$

Part 3. LIST OF ATTACHMENTS (Fill in for each document and attach a copy)

REQUIRED WITH ALL PLEDGE OF REVENUE SUBMITTALS:

Resolution #94-167; 04/05/1994 — 1. RESOLUTION BY GOVERNING BODY (Date and Resolution Number)

Agree #145-94; 03/03/1994 — 2. PLEDGE OF REVENUE AGREEMENT DATE

May 29, 2020 — 3. DATE OF ANNUAL CERTIFICATION OF CONTINUED AVAILABILITY OF PLEDGED REVENUE (See Instructions)

Part 4. SIGNATURE BLOCK

OWNER/OPERATOR ESTABLISHING PLEDGE OF REVENUE

I certify under penalty of perjury that the information provided in this form and any attachments is true and correct to the best of my knowledge and belief.

SIGNATURE: Samuel Lux

PRINTED NAME: Samuel Lux

TITLE: Assistant Director DATE: May 29, 2020

Part 5. OTHER (Attach additional sheets to explain any responses that need clarification).

ANNUAL CERTIFICATION OF PLEDGED REVENUE FOR
(See attached list) LANDFILL
SOLID WASTE FACILITY NO. (See attached list)

I hereby certify thatthe pledged revenue continues to be available when needed and will cover the postclosure maintenance costs and/or corrective action costs shown in the Pledge of Revenue Requirements Form and as required by Title 27, California Code of Regulations, Division 2, Subdivision 1, Chapter 6.

Signature

May 29, 2020
Date

Typed or Printed Name Samuel Lux

Title and Public Agency Assistant Director - Kern County Public Works Department

Phone Number (661) 862-8858

Please sign and return this Certification to California Department of Resources Recycling and Recovery (Cal Recycle) P.O. Box 4025, Sacramento, California 95812-4025, and to the attention of the Manager, Financial Assurances Section, MS 10A-18.

COUNTY OF KERN
PLEDGE OF REVENUE REQUIREMENTS
FORM 114 POSTCLOSURE MAINTENANCE COSTS

Solid Waste Facility	Solid Waste Facility Permit Number	Postclosure Maintenance Costs
Arvin Sanitary Landfill (SLF)	15-AA-0050	$2,727,283
Bena SLF – Phase 1	15-AA-0273	$3,786,124
Bena SLF – Phase 2	15-AA-0273	$8,947,282
Boron SLF	15-AA-0045	$2,230,000
Buttonwillow SLF	15-AA-0047	$997,968
China Grade SLF	15-AA-0048	$1,796,100
Glennville SLF	15-AA-0051	$117,199
Kern Valley SLF	15-AA-0055	$3,387,590
Lebec SLF	15-AA-0056	$937,697
Lost Hills SLF	15-AA-0052	$879,080
McFarland-Delano SLF	15-AA-0063	$1,632,331
Mojave-Rosamond SLF Phase 1	15-AA-0058	$2,713,418
Mojave-Rosamond SLF Phase 2 - 6	15-AA-0058	$22,002,482
Ridgecrest SLF	15-AA-0059	$7,825,800
Shafter-Wasco SLF	15-AA-0057	$9,156,292
Taft SLF	15-AA-0061	$6,511,403
Tehachapi SLF	15-AA-0062	$2,052,463
TOTAL		**$77,700,512**

PLEDGE OF REVENUE REQUIREMENTS

NOTE: This form is the transmittal sheet for documents required to be submitted to CalRecycle for a Pledge of Revenue as specified in Title 27, California Code of Regulations, Division 2, Subdivision 1, Chapter 6. Please refer to the instructions for definitions of terms and for completing this form.

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Check one box only

☒ OWNER ☐ OPERATOR

OWNER/OPERATOR NAME (Type or Print)	NAME OF CONTACT FOR PLEDGE OF REVENUE (Type or Print)
County of Kern (Public Works Department)	Samuel Lux
ADDRESS, CITY, STATE, ZIP	ADDRESS, CITY, STATE, ZIP
2700 M St., Ste. 450 Bakersfield, CA 93301	2700 M St., Ste. 450 Bakersfield, CA 93301
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E-MAIL ADDRESS: solidwaste@kerncounty.com	E-MAIL ADDRESS: luxs@kerncounty.com

Part 2. PLEDGE OF REVENUE

PLEDGE OF REVENUE AGREEMENT FOR: (Check applicable boxes):	ANNUAL PLEDGED REVENUE
☐ 1. POSTCLOSURE MAINTENANCE COSTS	$
☑ 2. CORRECTIVE ACTION COSTS	$ (See attached list)
☐ 3. BOTH (COMBINED COSTS AS WELL AS COSTS IDENTIFIED ABOVE)	$

Part 3. LIST OF ATTACHMENTS (Fill in for each document and attach a copy)

REQUIRED WITH ALL PLEDGE OF REVENUE SUBMITTALS:

Resolution #2012-267; 09/11/12 — 1. RESOLUTION BY GOVERNING BODY (Date and Resolution Number)

Agree #702-2012; 09/11/12 — 2. PLEDGE OF REVENUE AGREEMENT DATE

May 29, 2020 — 3. DATE OF ANNUAL CERTIFICATION OF CONTINUED AVAILABILITY OF PLEDGED REVENUE (See Instructions)

Part 4. SIGNATURE BLOCK

OWNER/OPERATOR ESTABLISHING PLEDGE OF REVENUE

I certify under penalty of perjury that the information provided in this form and any attachments is true and correct to the best of my knowledge and belief.

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PRINTED NAME: Samuel Lux

TITLE: Assistant Director DATE: May 29, 2020

Part 5. OTHER (Attach additional sheets to explain any responses that need clarification).

ANNUAL CERTIFICATION OF PLEDGED REVENUE FOR
(See attached list) LANDFILL
SOLID WASTE FACILITY NO. (See attached list)

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Signature

May 29, 2020
Date

Typed or Printed Name Samuel Lux

Title and Public Agency Assistant Director, Kern County Public Works Department

Phone Number (661) 862-8858

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COUNTY OF KERN
PLEDGE OF REVENUE REQUIREMENTS
FORM 114 CORRECTIVE ACTION COSTS

Solid Waste Facility	Solid Waste Facility Permit Number	Corrective Action Costs
Arvin Sanitary Landfill (SLF)	15-AA-0050	$398,497
Bena SLF	15-AA-0273	$793,029
Boron SLF	15-AA-0045	$254,541
Buttonwillow SLF	15-AA-0047	$473,288
China Grade SLF	15-AA-0048	$603,618
Glennville	15-AA-0051	$33,594*
Kern Valley SLF	15-AA-0055	$177,126
Lebec SLF	15-AA-0056	$531,464
Lost Hills SLF	15-AA-0052	$363,351
McFarland-Delano SLF	15-AA-0063	$267,825
Mojave-Rosamond SLF	15-AA-0058	$193,942
Ridgecrest SLF	15-AA-0059	$624,412
Shafter-Wasco SLF	15-AA-0057	$862,761
Taft SLF	15-AA-0061	$481,902
Tehachapi SLF	15-AA-0062	$575,097
TOTAL		**$6,634,447**

*Non-water corrective action cost

Appendix C Water Balance

EST. 1968 PROVOST & PRITCHARD ENGINEERING GROUP
An Employee-Owned Company

Buttonwillow PUD

Exhibit 1 - Proposed WWTF Expansion Capacity with New Reclamation

JOB #:241420002
COMP. BY:HAR
CHKD. BY:KKS
DATE: 4/19/2021

Wastewater Reclamation - 100-Year Rainfall Water Balance, Irrigation and Storage
Lined Ponds

DATA:

Month	Number of Days per Month	Avg Rainfall 1/ (in/month)	Avg Evaporation 3/ (in/month)	Avg ET Alfalfa 4/ (in/month)
January	31	1.27	0.88	0.68
February	28	1.45	2.23	1.69
March	31	0.81	3.07	2.34
April	30	0.63	6.96	5.28
May	31	0.23	7.99	6.07
June	30	0.04	9.03	6.86
July	31	0.00	10.15	7.75
August	31	0.01	8.09	6.16
September	30	0.06	6.43	4.95
October	31	0.35	5.39	4.09
November	30	0.57	2.06	1.57
December	31	0.82	1.69	1.29
Total	**365**	**6.24**	**63.97**	**48.73**

Daily Effluent Production 5/ =	120,000	gpd	
Proposed Aeration Pond Wet Area 6/ =	0.0	acres	
Existing Oxidation Ponds Wet Area =	5.6	acres	
Oxidation Ponds Percolation Rate =	0.00	in/day	
Proposed Storage Pond Wet Area =	5.6	acres	
Proposed Pond Storage =	46.7	ac-ft	*8.4 ft deep*
Proposed Pond Percolation Rate =		in/day	
Total Storage (Existing / Proposed) =	46.7	ac-ft	
Total Storage =	15,218,566	gal	
Alfalfa Crop Area 14/ =	36.0	acres	
Alfalfa Rootzone AWHC 15/ =	10.80	inch	**Total (gal)**
Total Area =	*41.6*	*acres*	**Total (ac-ft)**

WWTF POND CALCULATIONS:

	Effluent Produced 16/ (gal/month)	Effluent Exported (gal/month)	Effluent to Ponds 18/ (gal/month)	Surface Rainfall 19/ (gal/month)	Surface Evaporation 20/ (gal/month)	Pond Percolation 21/ (gal/month)	Monthly Available 22/ (gal/month)	Cumulative Available 23/ (gal/month)	
January	3,720,000	0	3,720,000	384,863	266,677	0	3,838,186	14,305,300	
February	3,360,000	0	3,360,000	439,411	675,783	0	3,123,628	17,428,928	
March	3,720,000	0	3,720,000	245,464	930,338	0	3,035,126	20,464,054	
April	3,600,000	0	3,600,000	190,916	2,109,171	0	1,681,745	22,145,799	
May	3,720,000	0	3,720,000	69,700	2,421,304	0	1,368,396	23,514,195	
June	3,600,000	0	3,600,000	12,122	2,736,468	0	875,654	24,389,849	
July	3,720,000	0	3,720,000	0	3,075,875	0	644,125	25,033,974	
August	3,720,000	0	3,720,000	3,030	2,451,609	0	1,271,421	26,305,395	
September	3,600,000	0	3,600,000	18,183	1,948,559	0	1,669,624	1,669,624	*
October	3,720,000	0	3,720,000	106,065	1,633,396	0	2,192,669	3,862,293	
November	3,600,000	0	3,600,000	172,734	624,266	0	3,148,468	7,010,761	
December	3,720,000	0	3,720,000	248,494	512,141	0	3,456,353	10,467,114	
Total	**43,800,000**	**0**	**43,800,000**	**1,890,982**	**19,385,587**	**0**	**26,305,395**		* *Start at 0 Stored*
Total (ac-ft)	**134.4**	**0.0**	**134.4**	**5.8**	**59.5**	**0.0**	**80.7**		*September 1st*

1/ Rainfall Data per the Western Regional Climate Center.
3/ Evaporation data per DWR Crop Water Use Guide (March 1993)
4/ Evapotranspiration (ET) data per DWR Crop Water Use Guide (March 1993)
5/ Daily Effluent Production Capacity.
6/ Total existing wet area of both ponds.
7/ Total existing wet area of the existing oxidation pond.
14/ Proposed reclamation area = 40 acres currently owned by Buttonwillow - 3 acres for solar project
15/ Soil Rootzone AWHC (USDA-SCS) = Ave. 1.8 in/ft x Alfalfa rootzone depth of 6 ft.
16/ Effluent Produced = Daily effluent production 5/ x days/month.
17/ No effluent exported.
18/ Effluent to Ponds = Effluent volume going to proposed storage ponds.
19/ Surface Rainfall = Volume of 100-Year rainfall on the existing WWTF treatment and storage ponds and proposed storage ponds.
20/ Surface Evaporation = Volume of effluent and rain water evaporating from the existing WWTF treatment and disposal ponds.
21/ Pond Percolation = Volume of effluent and rain water percolating into the ground for existing ponds 1 through 6 (not CM lagoon) and proposed disposal ponds.
22/ Monthly Available = Effluent produced - exported + rainfall - evaporation -percolation.
23/ Cumulative Available = Theoretical starting point Sept. 1st where pond storage starts at zero with monthly contributions.
24/ Effluent to Ponds = Volume of Effluent going to proposed storage ponds.
26/ Crop Area = Acres of Alfalfa
27/ Irrigation Application Efficiency
28/ Effluent Applied = Amount of effluent applied to reclamation area/ alfalfa (gallons & inches).
29/ Effective Rainfall = Usable rainfall calculated using DWR estimation method.
30/ Fresh Irrigation = Fresh water applied in addition to effluent to meet crop water demands.
31/ Gross Crop Need = ET of Crop divided by Irrigation Efficiency.
32/ Soil Moisture Start = Rootzone available moisture at the beginning of the month.
33/ Soil Moisture End = Rootzone available moisture at the end of the month.
34/ Percolation & Leaching = Deep percolation losses and leaching requirement.
35/ Cummulative Available = Total volume of efflulent available at the end of each month.
36/ Maximum Storage Needed = Peak end of month pond storage volume needed (gallons & ac-ft).
37/ Storage Available from Proposed Ponds = Total volume of available storage.
38/ Extra Storage = Volume of available storage above maximum needed.
39/ Check Balance = Comparison of this value with 16/.

CROP WATER USE CALCULATIONS:

Alfalfa 26/ — **36.0** acres — Irrigation Application Efficiency 27/ = **70%**

	Effluent Applied 28/ (gal)	Effluent Applied 28/ (in)	Effective Rainfall 29/ (in)	Fresh Irrigation 30/ (in)	Gross Crop Need 31/ (in)	Soil Moisture 32/ Start (in)	Soil Moisture 33/ End (in)	Percolation & Leaching 34/ >10.8 in	Cumulative Available 35/ (gal/month)
January	1,919,093	1.96	0.65	0.00	0.97	9.71	11.35	0.55	1,919,093
February	1,561,814	1.60	0.82	0.00	2.41	10.80	10.81	0.01	*3,480,907*
March	3,035,126	3.11	0.22	0.00	3.34	10.80	10.79	0.00	3,480,907
April	3,181,745	3.26	0.05	3.00	7.54	10.79	9.56	0.00	1,980,907
May	1,368,396	1.40	0.00	7.00	8.67	9.56	9.29	0.00	1,980,907
June	2,794,747	2.86	0.00	6.00	9.80	9.29	8.35	0.00	61,814
July	705,939	0.72	0.00	8.00	11.07	8.35	6.00	0.00	0
August	1,271,421	1.30	0.00	8.00	8.80	6.00	6.50	0.00	0
September	1,669,624	1.71	0.00	4.26	7.07	6.50	**5.40**	0.00	0
October	2,192,669	2.24	0.00	5.00	5.84	5.40	6.80	0.00	0
November	3,148,468	3.22	0.00	0.00	2.24	6.80	7.78	0.00	0
December	3,456,353	3.54	0.23	0.00	1.84	7.78	9.71	0.00	0
Totals	**26,305,395**	**26.92**	**1.97**	**41.26**	**69.59**			**0.56**	* *Start at 0 Stored*
Total ac-ft	**80.7**		**5.9**	**124**	**208.8**			**1.7**	*September 1st*
% of Total Water Applied to Crop	**38%**		**3%**	**59%**	**210.5**				

Annual Water Balance Summary

Maximum Storage Needed 36/:	3,480,907	gal
Maximum Storage Needed 36/:	11	ac-ft
Total Storage Available 37/:	15,218,566	gal
Extra Storage 38/:	**11,737,659**	gal
	36	ac-ft
Total Effluent Production 16/:	43,800,000	gal
Total Effluent Exported 17/:	0	gal
Total Surface Rainfall 19/:	1,890,982	gal
Total Evaporation 20/:	19,385,587	gal
Total Percolation 21/:	0	gal
Effluent Applied to Crop 28/ :	26,305,395	gal
Check Balance 39/:	0	gal

Sheet Name: Exhibit 1 - AVG yr LINED

REV: 04/22/05

EST. 1968 PROVOST & PRITCHARD ENGINEERING GROUP
An Employee-Owned Company

JOB #: 241420002
COMP. BY:HAR
CHKD. BY:KKS
DATE: 4/19/2021

Buttonwillow PUD

Exhibit 1 - Proposed WWTF Expansion Capacity with New Reclamation

Wastewater Reclamation - 100-Year Rainfall Water Balance, Irrigation and Storage
Lined Ponds

DATA:

Month	Number of Days per Month	100 yr Rainfall 1/ (in/month)	100 yr Evaporation 3/ (in/month)	100 yr ET Alfalfa 4/ (in/month)
January	31	2.35	1.50	1.08
February	28	2.40	3.07	1.61
March	31	2.33	5.31	3.51
April	30	1.32	5.77	5.54
May	31	0.52	8.28	6.24
June	30	0.16	9.40	7.20
July	31	0.02	11.13	7.71
August	31	0.09	8.85	6.88
September	30	0.25	6.90	4.86
October	31	0.63	4.70	2.12
November	30	1.39	2.34	1.63
December	31	1.86	1.32	1.36
Total	**365**	**13.32**	**68.57**	**49.74**

Daily Effluent Production 5/ =	**120,000**	gpd		
Proposed Aeration Pond Wet Area 6/ =	**0.0**	acres		
Existing Oxidation Ponds Wet Area =	**5.6**	acres		
Oxidation Ponds Percolation Rate =	**0.00**	in/day		
Proposed Storage Pond Wet Area =	**5.6**	acres		
Proposed Pond Storage =	**46.7**	ac-ft	*8.4 ft deep*	
Proposed Pond Percolation Rate =		in/day		
Total Storage (Existing / Proposed) =	**46.7**	ac-ft		
Total Storage =	**15,218,566**	gal		
Alfalfa Crop Area 14/ =	**36.0**	acres		
Alfalfa Rootzone AWHC 15/ =	**10.80**	inch	**Total (gal)**	
Total Area =	*41.6*	*acres*	**Total (ac-ft)**	

WWTF POND CALCULATIONS:

	Effluent Produced 16/ (gal/month)	Effluent Exported (gal/month)	Effluent to Ponds 18/ (gal/month)	Surface Rainfall 19/ (gal/month)	Surface Evaporation 20/ (gal/month)	Pond Percolation 21/ (gal/month)	Monthly Available 22/ (gal/month)	Cumulative Available 23/ (gal/month)	
January	3,720,000	0	3,720,000	713,526	454,563	0	3,978,963	15,244,913	
February	3,360,000	0	3,360,000	727,117	930,338	0	3,156,779	18,401,692	
March	3,720,000	0	3,720,000	706,730	1,609,152	0	2,817,578	21,219,270	
April	3,600,000	0	3,600,000	400,934	1,748,551	0	2,252,383	23,471,653	
May	3,720,000	0	3,720,000	156,296	2,509,187	0	1,367,109	24,838,762	
June	3,600,000	0	3,600,000	47,568	2,848,593	0	798,975	25,637,737	
July	3,720,000	0	3,720,000	6,795	3,372,856	0	353,939	25,991,676	
August	3,720,000	0	3,720,000	27,182	2,681,920	0	1,065,262	27,056,938	
September	3,600,000	0	3,600,000	74,750	2,090,989	0	1,583,761	1,583,761	*
October	3,720,000	0	3,720,000	190,274	1,424,297	0	2,485,977	4,069,738	
November	3,600,000	0	3,600,000	421,320	709,118	0	3,312,202	7,381,940	
December	3,720,000	0	3,720,000	564,025	400,015	0	3,884,010	11,265,950	
Total (gal)	**43,800,000**	**0**	**43,800,000**	**4,036,517**	**20,779,579**	**0**	**27,056,938**		* *Start at 0 Stored*
Total (ac-ft)	**134.4**	**0.0**	**134.4**	**12.4**	**63.8**	**0.0**	**83.0**		*September 1st*

CROP WATER USE CALCULATIONS:

Alfalfa 26/ — **36.0** acres — Irrigation Application Efficiency 27/ = **70%**

	Effluent Applied 28/ (gal)	Effluent Applied 28/ (in)	Effective Rainfall 29/ (in)	Fresh Irrigation 30/ (in)	Gross Crop Need 31/ (in)	Soil Moisture Start (in)	Soil Moisture End (in)	Percolation & Leaching 34/ >10.8 in	Cumulative Available 35/ (gal/month)
January	0	0.00	1.67	0.00	1.54	9.98	10.11	0.00	3,978,963
February	1,578,390	1.61	1.72	0.00	2.30	10.11	11.14	0.34	*5,557,353*
March	2,817,578	2.88	1.65	0.00	5.01	10.80	10.32	0.00	5,557,353
April	4,252,383	4.35	0.70	0.00	7.91	10.32	7.46	0.00	3,557,353
May	4,924,462	5.04	0.00	2.00	8.91	7.46	5.59	0.00	0
June	798,975	0.82	0.00	9.00	10.29	5.59	5.12	0.00	0
July	353,939	0.36	0.00	11.00	11.01	5.12	5.47	0.00	0
August	1,065,262	1.09	0.00	9.00	9.83	5.47	5.73	0.00	0
September	1,583,761	1.62	0.00	4.99	6.94	5.73	**5.40**	0.00	0
October	2,485,977	2.54	0.00	0.00	3.03	5.40	4.91	0.00	0
November	3,312,202	3.39	0.77	0.00	2.33	4.91	6.74	0.00	0
December	3,884,010	3.97	1.21	0.00	1.94	6.74	9.98	0.00	0
Totals	**27,056,938**	**27.67**	**7.72**	**35.99**	**71.04**			**0.34**	* *Start at 0 Stored*
Total ac-ft	**83.0**		**23.2**	**108**	**213.1**			**1.0**	*September 1st*
% of Total Water Applied to Crop	**39%**		**11%**	**50%**	**214.1**				

Annual Water Balance Summary

Maximum Storage Needed 36/:	5,557,353	gal
Maximum Storage Needed 36/:	17	ac-ft
Total Storage Available 37/:	15,218,566	gal
Extra Storage 38/:	**9,661,214**	gal
	30	ac-ft
Total Effluent Production 16/:	43,800,000	gal
Total Effluent Exported 17/:	0	gal
Total Surface Rainfall 19/:	4,036,517	gal
Total Evaporation 20/:	20,779,579	gal
Total Percolation 21/:	0	gal
Effluent Applied to Crop 28/ :	27,056,938	gal
Check Balance 39/:	0	gal

1/ Rainfall Data per the Western Regional Climate Center.
3/ Evaporation data per DWR Crop Water Use Guide for 1988 (March 1993)
4/ Evapotranspiration (ET) data per ITRC Wet Year Water Balance Zone 15
5/ Daily Effluent Production Capacity.
6/ Total existing wet area of both ponds.
7/ Total existing wet area of the existing oxidation pond.
14/ Proposed reclamation area = 40 acres currently owned by Buttonwillow - 3 acres for solar project
15/ Soil Rootzone AWHC (USDA-SCS) = Ave. 1.8 in/ft x Alfalfa rootzone depth of 6 ft.
16/ Effluent Produced = Daily effluent production 5/ x days/month.
17/ No effluent exported.
18/ Effluent to Ponds = Effluent volume going to proposed storage ponds.
19/ Surface Rainfall = Volume of 100-Year rainfall on the existing WWTF treatment and storage ponds and proposed storage ponds.
20/ Surface Evaporation = Volume of effluent and rain water evaporating from the existing WWTF treatment and disposal ponds.
21/ Pond Percolation = Volume of effluent and rain water percolating into the ground for existing ponds 1 through 6 (not CM lagoon) and proposed disposal ponds.
22/ Monthly Available = Effluent produced - exported + rainfall - evaporation -percolation.
23/ Cumulative Available = Theoretical starting point Sept. 1st where pond storage starts at zero with monthly contributions.
24/ Effluent to Ponds = Volume of Effluent going to proposed storage ponds.
26/ Crop Area = Acres of Alfalfa
27/ Irrigation Application Efficiency
28/ Effluent Applied = Amount of effluent applied to reclamation area/ alfalfa (gallons & inches).
29/ Effective Rainfall = Usable rainfall calculated using DWR estimation method.
30/ Fresh Irrigation = Fresh water applied in addition to effluent to meet crop water demands.
31/ Gross Crop Need = ET of Crop divided by Irrigation Efficiency.
32/ Soil Moisture Start = Rootzone available moisture at the beginning of the month.
33/ Soil Moisture End = Rootzone available moisture at the end of the month.
34/ Percolation & Leaching = Deep percolation losses and leaching requirement.
35/ Cummulative Available = Total volume of efflulent available at the end of each month.
36/ Maximum Storage Needed = Peak end of month pond storage volume needed (gallons & ac-ft).
37/ Storage Available from Proposed Ponds = Total volume of available storage.
38/ Extra Storage = Volume of available storage above maximum needed.
39/ Check Balance = Comparison of this value with 16/.

Sheet Name: Exhibit 1 - Wet yr LINED

EST. 1968 PROVOST & PRITCHARD ENGINEERING GROUP
An Employee-Owned Company

Buttonwillow PUD

Exhibit 1 - Proposed WWTF Expansion Capacity with New Reclamation

JOB #:2414 20002
COMP. BY:HAR
CHKD. BY:KKS
DATE: 4/19/2021

Wastewater Reclamation - Dry Year Rainfall Water Balance, Irrigation and Storage
Lined Ponds

DATA:

Month	Number of Days per Month	Dry yr Rainfall 1/ (in/month)	Dry yr Evaporation 3/ (in/month)	Avg ET Alfalfa 4/ (in/month)
January	31	0.61	1.50	0.68
February	28	0.62	3.07	1.69
March	31	0.60	5.31	2.34
April	30	0.34	5.77	5.28
May	31	0.13	8.28	6.07
June	30	0.04	9.40	6.86
July	31	0.01	11.13	7.75
August	31	0.02	8.85	6.16
September	30	0.06	6.90	4.95
October	31	0.16	4.70	4.09
November	30	0.36	2.34	1.57
December	31	0.48	1.32	1.29
Total	**365**	**3.43**	**68.57**	**48.73**

Daily Effluent Production 5/ =	**120,000**	gpd		
Proposed Aeration Pond Wet Area 6/ =	**0.0**	acres		
Existing Oxidation Ponds Wet Area =	**5.6**	acres		
Oxidation Ponds Percolation Rate =	**0.00**	in/day		
Proposed Storage Pond Wet Area =	**5.6**	acres		
Proposed Pond Storage =	**46.7**	ac-ft	*8.4 ft deep*	
Proposed Pond Percolation Rate =		in/day		
Total Storage (Existing / Proposed) =	**46.7**	ac-ft		
Total Storage =	**15,218,566**	gal		
Alfalfa Crop Area 14/ =	**36.0**	acres		
Alfalfa Rootzone AWHC 15/ =	**10.80**	inch	**Total (gal)**	
Total Area =	*41.6*	*acres*	**Total (ac-ft)**	

WWTF POND CALCULATIONS:

	Effluent Produced 16/ (gal/month)	Effluent Exported (gal/month)	Effluent to Ponds 18/ (gal/month)	Surface Rainfall 19/ (gal/month)	Surface Evaporation 20/ (gal/month)	Pond Percolation 21/ (gal/month)	Monthly Available 22/ (gal/month)	Cumulative Available 23/ (gal/month)	
January	3,720,000	0	3,720,000	183,738	454,563	0	3,449,175	13,786,736	
February	3,360,000	0	3,360,000	187,238	930,338	0	2,616,900	16,403,636	
March	3,720,000	0	3,720,000	181,988	1,609,152	0	2,292,836	18,696,472	
April	3,600,000	0	3,600,000	103,243	1,748,551	0	1,954,692	20,651,164	
May	3,720,000	0	3,720,000	40,247	2,509,187	0	1,251,060	21,902,224	
June	3,600,000	0	3,600,000	12,249	2,848,593	0	763,656	22,665,880	
July	3,720,000	0	3,720,000	1,750	3,372,856	0	348,894	23,014,774	
August	3,720,000	0	3,720,000	7,000	2,681,920	0	1,045,080	24,059,854	
September	3,600,000	0	3,600,000	19,249	2,090,989	0	1,528,260	1,528,260	*
October	3,720,000	0	3,720,000	48,997	1,424,297	0	2,344,700	3,872,960	
November	3,600,000	0	3,600,000	108,493	709,118	0	2,999,375	6,872,335	
December	3,720,000	0	3,720,000	145,241	400,015	0	3,465,226	10,337,561	
Total (gal)	**43,800,000**	**0**	**43,800,000**	**1,039,433**	**20,779,579**	**0**	**24,059,854**		* *Start at 0 Stored*
Total (ac-ft)	**134.4**	**0.0**	**134.4**	**3.2**	**63.8**	**0.0**	**73.8**		*September 1st*

CROP WATER USE CALCULATIONS:

Alfalfa 26/ — **36.0** acres — Irrigation Application Efficiency 27/ = **70%**

	Effluent Applied 28/ (gal)	Effluent Applied 28/ (in)	Effective Rainfall 29/ (in)	Fresh Irrigation 30/ (in)	Gross Crop Need 31/ (in)	Soil Moisture Start (in)	Soil Moisture End (in)	Percolation & Leaching 34/ >10.8 in	Cumulative Available 35/ (gal/month)
January	3,449,175	3.53	0.03	0.00	0.97	6.96	9.55	0.00	1,499,688
February	1,308,450	1.34	0.04	0.00	2.41	9.55	8.52	0.00	*2,808,138*
March	2,292,836	2.35	0.02	0.00	3.34	8.52	7.55	0.00	2,808,138
April	4,762,830	4.87	0.00	2.00	7.54	7.55	6.88	0.00	0
May	1,251,060	1.28	0.00	6.00	8.67	6.88	5.49	0.00	0
June	763,656	0.78	0.00	9.00	9.80	5.49	5.47	0.00	0
July	348,894	0.36	0.00	10.50	11.07	5.47	5.26	0.00	0
August	1,045,080	1.07	0.00	8.00	8.80	5.26	5.53	0.00	0
September	1,528,260	1.56	0.00	5.38	7.07	5.53	**5.40**	0.00	0
October	2,344,700	2.40	0.00	4.00	5.84	5.40	5.96	0.00	0
November	1,499,688	1.53	0.00	0.00	2.24	5.96	5.25	0.00	1,499,688
December	3,465,226	3.55	0.00	0.00	1.84	5.25	6.96	0.00	1,499,688
Totals	**24,059,854**	**24.62**	**0.09**	**44.88**	**69.59**			**0.00**	* *Start at 0 Stored*
Total ac-ft	**73.8**		**0.3**	**135**	**208.8**			**0.0**	*September 1st*
% of Total Water Applied to Crop	**35%**		**0%**	**64%**	**208.8**				

Annual Water Balance Summary

Maximum Storage Needed 36/:	2,808,138	gal
Maximum Storage Needed 36/:	9	ac-ft
Total Storage Available 37/:	15,218,566	gal
Extra Storage 38/:	**12,410,429**	gal
	38	ac-ft
Total Effluent Production 16/:	43,800,000	gal
Total Effluent Exported 17/:	0	gal
Total Surface Rainfall 19/:	1,039,433	gal
Total Evaporation 20/:	20,779,579	gal
Total Percolation 21/:	0	gal
Effluent Applied to Crop 28/ :	24,059,854	gal
Check Balance 39/:	0	gal

1/ Rainfall Data per the Western Regional Climate Center.
3/ Evaporation data per DWR Crop Water Use Guide for 1988 (March 1993)
4/ Evapotranspiration (ET) data per ITRC Wet Year Water Balance Zone 15
5/ Daily Effluent Production Capacity.
6/ Total existing wet area of both ponds.
7/ Total existing wet area of the existing oxidation pond.
14/ Proposed reclamation area = 40 acres currently owned by Buttonwillow - 3 acres for solar project
15/ Soil Rootzone AWHC (USDA-SCS) = Ave. 1.8 in/ft x Alfalfa rootzone depth of 6 ft.
16/ Effluent Produced = Daily effluent production 5/ x days/month.
17/ No effluent exported.
18/ Effluent to Ponds = Effluent volume going to proposed storage ponds.
19/ Surface Rainfall = Volume of 100-Year rainfall on the existing WWTF treatment and storage ponds and proposed storage ponds.
20/ Surface Evaporation = Volume of effluent and rain water evaporating from the existing WWTF treatment and disposal ponds.
21/ Pond Percolation = Volume of effluent and rain water percolating into the ground for existing ponds 1 through 6 (not CM lagoon) and proposed disposal ponds.
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23/ Cumulative Available = Theoretical starting point Sept. 1st where pond storage starts at zero with monthly contributions.
24/ Effluent to Ponds = Volume of Effluent going to proposed storage ponds.
26/ Crop Area = Acres of Alfalfa
27/ Irrigation Application Efficiency
28/ Effluent Applied = Amount of effluent applied to reclamation area/ alfalfa (gallons & inches).
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37/ Storage Available from Proposed Ponds = Total volume of available storage.
38/ Extra Storage = Volume of available storage above maximum needed.
39/ Check Balance = Comparison of this value with 16/.

APPENDIX 2

AIR QUALITY and GHG IMPACT ANALYSES

BUTTONWILLOW WASTEWATER TREATMENT IMPROVEMENT PROJECT

KERN COUNTY, CALIFORNIA

Prepared by:

Sara Friedman Gerrick
Senior Engineer
Giroux & Associates

Prepared for:

Tom Dodson & Associates
Attn: Tom Dodson
PO Box 2307
San Bernardino, CA 92406-2307

Date:

May 27, 2022

Project No.: P22-023 AQ

METEOROLOGY CLIMATE

San Joaquin Valley Air Basin (SJVAB) includes San Joaquin County, Stanislaus County, Madera County, Fresno County, Kings County, Tulare County, and a portion of Kern County. Merced County is in the north-central portion of the SJVAB. The SJVAB is bordered on three sides by mountains: the Sierra Nevada to the east, the Coast Ranges to the west, and the Tehachapi mountains to the south. The SJVAB is open to the north to the Sacramento Valley. The San Joaquin Valley is approximately 250 miles long and averages approximately 35 miles in width. The mountains surrounding the SJVAB restrict air movement through and out of the basin, and as a result, impede the dispersion of pollutants from the basin.

Away from the cooling effects of the Pacific Ocean, the climate of Kern County can be characterized as hot in summer and cold in winter, compared with the coastal basins where the climate is moderated by the adjacent ocean. The SVJAB has an “inland Mediterranean” climate averaging over 260 sunny days per year. The valley floor is characterized by hot summers and mild humid winters. Summer high temperatures often exceed 100°F while the average daily low temperature in the winter is 45°F. Temperatures below freezing are rare. Summer winds in the SJVAB usually originate at the north end of the San Joaquin Valley and flow in a south-southeasterly direction while winter winds originate from the south and flow in a north-northwesterly direction. Winds in the winter months tend to be variable and light; often less than 10 mph. Precipitation in the San Joaquin Valley is strongly influenced by the position of the semi-permanent subtropical high-pressure zone located off the Pacific Coast. Most precipitation occurs in the winter months, with some occurring in late summer and fall. Average annual rainfall for the entire San Joaquin Valley is 9.25 inches on the valley floor.

AIR QUALITY SETTING

AMBIENT AIR QUALITY STANDARDS (AAQS)

In order to gauge the significance of the air quality impacts of the proposed project, those impacts, together with existing background air quality levels, must be compared to the applicable ambient air quality standards. These standards are the levels of air quality considered safe, with an adequate margin of safety, to protect the public health and welfare. They are designed to protect those people most susceptible to further respiratory distress such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise, called "sensitive receptors." Healthy adults can tolerate occasional exposure to air pollutant concentrations considerably above these minimum standards before adverse effects are observed. Recent research has shown, however, that chronic exposure to ozone (the primary ingredient in photochemical smog) may lead to adverse respiratory health even at concentrations close to the ambient standard.

National AAQS were established in 1971 for six pollution species with states retaining the option to add other pollutants, require more stringent compliance, or to include different exposure periods. The initial attainment deadline of 1977 was extended several times in air quality problem areas like Southern California. In 2003, the Environmental Protection Agency (EPA) adopted a rule, which extended and established a new attainment deadline for ozone for the year 2021. Because the State of California had established AAQS several years before the federal action and because of unique air quality problems introduced by the restrictive dispersion meteorology, there is considerable difference between state and national clean air standards. Those standards currently in effect in California are shown in Table 1. Sources and health effects of various pollutants are shown in Table 2.

The Federal Clean Air Act Amendments (CAAA) of 1990 required that the U.S. Environmental Protection Agency (EPA) review all national AAQS in light of currently known health effects. EPA was charged with modifying existing standards or promulgating new ones where appropriate. EPA subsequently developed standards for chronic ozone exposure (8+ hours per day) and for very small diameter particulate matter (called "PM-2.5"). New national AAQS were adopted in 1997 for these pollutants.

Planning and enforcement of the federal standards for PM-2.5 and for ozone (8-hour) were challenged by trucking and manufacturing organizations. In a unanimous decision, the U.S. Supreme Court ruled that EPA did not require specific congressional authorization to adopt national clean air standards. The Court also ruled that health-based standards did not require preparation of a cost-benefit analysis. The Court did find, however, that there was some inconsistency between existing and "new" standards in their required attainment schedules. Such attainment-planning schedule inconsistencies centered mainly on the 8-hour ozone standard. EPA subsequently agreed to downgrade the attainment designation for a large number of communities to “non-attainment” for the 8-hour ozone standard.

Table 1

Ambient Air Quality Standards						
Pollutant	**Averaging Time**	**California Standards** [1]		**National Standards** [2]		
		Concentration [3]	**Method** [4]	**Primary** [3,5]	**Secondary** [3,6]	**Method** [7]
Ozone (O_3)[8]	1 Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m^3)		0.070 ppm (137 µg/m^3)		
Respirable Particulate Matter (PM10)[9]	24 Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		—		
Fine Particulate Matter (PM2.5)[9]	24 Hour	—	—	35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	12.0 µg/m^3	15 µg/m^3	
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	35 ppm (40 mg/m^3)	—	Non-Dispersive Infrared Photometry (NDIR)
	8 Hour	9.0 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)	—	
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		—	—	
Nitrogen Dioxide (NO_2)[10]	1 Hour	0.18 ppm (339 µg/m^3)	Gas Phase Chemiluminescence	100 ppb (188 µg/m^3)	—	Gas Phase Chemiluminescence
	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)		0.053 ppm (100 µg/m^3)	Same as Primary Standard	
Sulfur Dioxide (SO_2)[11]	1 Hour	0.25 ppm (655 µg/m^3)	Ultraviolet Fluorescence	75 ppb (196 µg/m^3)	—	Ultraviolet Flourescence; Spectrophotometry (Pararosaniline Method)
	3 Hour	—		—	0.5 ppm (1300 µg/m^3)	
	24 Hour	0.04 ppm (105 µg/m^3)		0.14 ppm (for certain areas)[11]	—	
	Annual Arithmetic Mean	—		0.030 ppm (for certain areas)[11]	—	
Lead[12,13]	30 Day Average	1.5 µg/m^3	Atomic Absorption	—	—	High Volume Sampler and Atomic Absorption
	Calendar Quarter	—		1.5 µg/m^3 (for certain areas)[12]	Same as Primary Standard	
	Rolling 3-Month Average	—		0.15 µg/m^3		
Visibility Reducing Particles[14]	8 Hour	See footnote 14	Beta Attenuation and Transmittance through Filter Tape	**No National Standards**		
Sulfates	24 Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[12]	24 Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

See footnotes on next page …

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Table 1 (continued)

1. California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM10, PM2.5, 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 PM10, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For PM2.5, 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 PM2.5 primary standard was lowered from 15 $\mu g/m^3$ to 12.0 $\mu g/m^3$. The existing national 24-hour PM2.5 standards (primary and secondary) were retained at 35 $\mu g/m^3$, as was the annual secondary standard of 15 $\mu g/m^3$. The existing 24-hour PM10 standards (primary and secondary) of 150 $\mu g/m^3$ 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_2 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_2 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 $\mu g/m^3$ 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.

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Table 2
Health Effects of Major Criteria Pollutants

Pollutants	Sources	Primary Effects
Carbon Monoxide (CO)	• Incomplete combustion of fuels and other carbon-containing substances, such as motor exhaust. • Natural events, such as decomposition of organic matter.	• Reduced tolerance for exercise. • Impairment of mental function. • Impairment of fetal development. • Death at high levels of exposure. • Aggravation of some heart diseases (angina).
Nitrogen Dioxide (NO_2)	• Motor vehicle exhaust. • High temperature stationary combustion. • Atmospheric reactions.	• Aggravation of respiratory illness. • Reduced visibility. • Reduced plant growth. • Formation of acid rain.
Ozone (O_3)	• Atmospheric reaction of organic gases with nitrogen oxides in sunlight.	• Aggravation of respiratory and cardiovascular diseases. • Irritation of eyes. • Impairment of cardiopulmonary function. • Plant leaf injury.
Lead (Pb)	• Contaminated soil.	• Impairment of blood function and nerve construction. • Behavioral and hearing problems in children.
Respirable Particulate Matter (PM-10)	• Stationary combustion of solid fuels. • Construction activities. • Industrial processes. • Atmospheric chemical reactions.	• Reduced lung function. • Aggravation of the effects of gaseous pollutants. • Aggravation of respiratory and cardio respiratory diseases. • Increased cough and chest discomfort. • Soiling. • Reduced visibility.
Fine Particulate Matter (PM-2.5)	• Fuel combustion in motor vehicles, equipment, and industrial sources. • Residential and agricultural burning. • Industrial processes. • Also, formed from photochemical reactions of other pollutants, including NOx, sulfur oxides, and organics.	• Increases respiratory disease. • Lung damage. • Cancer and premature death. • Reduces visibility and results in surface soiling.
Sulfur Dioxide (SO_2)	• Combustion of sulfur-containing fossil fuels. • Smelting of sulfur-bearing metal ores. • Industrial processes.	• Aggravation of respiratory diseases (asthma, emphysema). • Reduced lung function. • Irritation of eyes. • Reduced visibility. • Plant injury. • Deterioration of metals, textiles, leather, finishes, coatings, etc.

Source: California Air Resources Board, 2002.

Evaluation of the most current data on the health effects of inhalation of fine particulate matter prompted the California Air Resources Board (ARB) to recommend adoption of the statewide PM-2.5 standard that is more stringent than the federal standard. This standard was adopted in 2002. The State PM-2.5 standard is more of a goal in that it does not have specific attainment planning requirements like a federal clean air standard, but only requires continued progress towards attainment.

Similarly, the ARB extensively evaluated health effects of ozone exposure. A new state standard for an 8-hour ozone exposure was adopted in 2005, which aligned with the exposure period for the federal 8-hour standard. The California 8-hour ozone standard of 0.07 ppm is more stringent than the federal 8-hour standard of 0.075 ppm. The state standard, however, does not have a specific attainment deadline. California air quality jurisdictions are required to make steady progress towards attaining state standards, but there are no hard deadlines or any consequences of non-attainment. During the same re-evaluation process, the ARB adopted an annual state standard for nitrogen dioxide ($NO_{2)}$ that is more stringent than the corresponding federal standard and strengthened the state one-hour NO_2 standard.

As part of EPA's 2002 consent decree on clean air standards, a further review of airborne particulate matter (PM) and human health was initiated. A substantial modification of federal clean air standards for PM was promulgated in 2006. Standards for PM-2.5 were strengthened, a new class of PM in the 2.5 to 10-micron size was created, some PM-10 standards were revoked, and a distinction between rural and urban air quality was adopted. In December 2012, the federal annual standard for PM-2.5 was reduced from 15 $\mu g/m^3$ to 12 $\mu g/m^3$ which matches the California AAQS. The severity of the basin's non-attainment status for PM-2.5 may be increased by this action and thus require accelerated planning for future PM-2.5 attainment.

In response to continuing evidence that ozone exposure at levels just meeting federal clean air standards is demonstrably unhealthful, EPA had proposed a further strengthening of the 8-hour standard. A new 8-hour ozone standard was adopted in 2015 after extensive analysis and public input. The adopted national 8-hour ozone standard is 0.07 ppm which matches the current California standard. It will require three years of ambient data collection, then 2 years of non-attainment findings and planning protocol adoption, then several years of plan development and approval. Final air quality plans for the new standard are likely to be adopted around 2022.

In 2010 a new federal one-hour primary standard for nitrogen dioxide (NO_2) was adopted. This standard is more stringent than the existing state standard. The federal standard for sulfur dioxide (SO_2) was also recently revised. However, with minimal combustion of coal and mandatory use of low sulfur fuels in California, SO_2 is typically not a problem pollutant.

BASELINE AIR MONITORING

The San Joaquin Valley Air Pollution Control District (SJVAPCD) operates a regional monitoring network that measures the ambient concentration of criteria pollutants. Existing levels of criteria air pollutants in the project area can generally be inferred from measurements conducted by the SJVAPCD at its Bakersfield California Avenue monitoring station and the Shafter at Smith Corner/Walker Street Station. There are no nearby stations that monitors CO.

Table 3 summarizes the monitoring history from the Shafter and Bakersfield monitoring stations for the last three years. From these data one can infer that baseline air quality levels near the project site are occasionally unhealthful, but that such violations of clean air standards usually affect only those people most sensitive to air pollution exposure.

a. Photochemical smog (ozone) levels occasionally exceed standards. The 8-hour state ozone standard has been exceeded an average of one percent of all days in the past three years near the project site and the 8-hour federal was violated seven percent during the same period. The 1-hour state standard has been violated slightly more than one percent of all days in the last three years.

b. Respirable dust (PM-10) levels exceed the state standard 13 percent of all measurement days, but the less stringent federal PM-10 standard was only violated once for the same time period.

c. The federal ultra-fine particulate (PM-2.5) standard of 35 $\mu g/m^3$ is often exceeded. From the data observed, 31 percent of all measurement days exceeded the 35 $\mu g/m^3$ standard.

Although complete attainment of every clean air standard is not yet imminent, extrapolation of the steady improvement trend suggests that such attainment could occur within the reasonably near future.

Table 3

Air Quality Monitoring Summary (2018-2020)
(Predicted Number of Days Standards Were Exceeded, and Maximum Levels During Such Violations)

Pollutant/Standard	2018	2019	2020
Ozone			
1-Hour > 0.09 ppm (S)	8	2	3
8-Hour > 0.07 ppm (S)	4	0	6
8- Hour > 0.075 ppm (F)	33	14	34
Max. 1-Hour Conc. (ppm)	0.098	0.087	0.116
Max. 8-Hour Conc. (ppm)	0.090	0.077	0.098
Nitrogen Dioxide			
1-Hour > 0.18 ppm (S)	0	0	0
Max. 1-Hour Conc. (ppm)	0.048	0.049	0.041
Respirable Particulates (PM-10)			
24-hour > 50 $\mu g/m^3$ (S)	13	17	18
24-hour > 150 $\mu g/m^3$ (F)	0	0	1
Max. 24-Hr. Conc. ($\mu g/m^3$)	136.1	116.3	193.8
Ultra-Fine Particulates (PM-2.5)			
24-Hour > 35 $\mu g/m^3$ (F)	36	12	44
Max. 24-Hr. Conc. ($\mu g/m^3$)	98.5	59.1	150.7

Source:
Ozone and NOx: Shafter at Smith Corner/Walker Street Station
PM-10 and PM-2.5: Bakersfield-California Avenue Station
data: www.arb.ca.gov/adam/

AIR QUALITY PLANNING

Fugitive dust emissions generated by construction activities are regulated by the SJVAPCD. Construction activities must comply with all applicable SJVAPCD rules and regulations, including SJVAPCD's Regulation VIII. Regulation VIII consists of several individual rules that require implementation of best available mitigation measures to limit construction dust emissions.

The San Joaquin Valley Air Basin has been determined by ARB and EPA to be in attainment of federal PM-10 standards. Regulation VIII has been accepted by ARB and EPA to maintain attainment of PM-10 standards in the Air Basin. In developing the 2007 Maintenance Plan, the SJVAPCD evaluated the potential PM-10 emissions that could occur under all sources within the Air Basin and developed rules and procedures to reduce future emissions sufficiently to maintain the existing attainment status. The full attainment status is shown in Table 4.

Table 4
San Joaquin Valley Air Basin Attainment Status[1]

	Designation/Classification	
Pollutant	**Federal Standards**	**State Standards**
Ozone – 1 Hour	Nonattainment/Extreme	Nonattainment/Severe
Ozone – 8 Hour	Nonattainment/Extreme	Nonattainment
PM-10*	Attainment	Nonattainment
PM 2.5	Nonattainment	Nonattainment
Carbon Monoxide	Attainment/Unclassified	Attainment/Unclassified
Nitrogen Dioxide	Attainment/Unclassified	Attainment
Sulfur Dioxide	Attainment/Unclassified	Attainment
Lead Particulates	No Designation	Attainment

*On September 25, 2008, EPA redesignated the San Joaquin Valley to attainment for the PM10 National Ambient Air Quality Standard (NAAQS) and approved the PM10 Maintenance Plan.

[1] https://www.valleyair.org/aqinfo/attainment.htm

AIR QUALITY IMPACT

STANDARDS OF SIGNIFICANCE

Air quality impacts are considered "significant" if they cause clean air standards to be violated where they are currently met, or if they "substantially" contribute to an existing violation of standards. Any substantial emissions of air contaminants for which there is no safe exposure, or nuisance emissions such as dust or odors, would also be considered a significant impact.

Appendix G of the California CEQA Guidelines offers the following five tests of air quality impact significance. A project would have a potentially significant impact if it:

a. Conflicts with or obstructs implementation of the applicable air quality plan.

b. Results in a cumulatively considerable net increase of any criteria pollutants 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).

c. Exposes sensitive receptors to substantial pollutant concentrations.

d. Creates objectionable odors affecting a substantial number of people.

The San Joaquin Valley Air Pollution Control District developed a CEQA Implementation Document that assigned an emissions level that it recommends should be considered as creating a potentially significant air quality impact. Construction projects are considered to have an air quality impact if they cause the following annual emissions to be exceeded (tons/year):

CO	-	100
NOx	-	10
ROG	-	10
SOx	-	27
PM-10	-	15
PM-2.5	-	15

FEDERAL THRESHOLDS

NEPA guidelines do not encourage designation of impacts as (in)significant. However, Section 176(c) of the Clean Air Act Amendments of 1990 prohibits federal participation in projects that would impede implementation of the state implementation plan (SIP) for federal non-attainment pollutants. "Participation" includes project funding as well as granting any federal permits. If the project-related emissions from construction and operations are less than specified "*de minimis*" levels, no further SIP consistency demonstration is required. San Joaquin County is designated as a non-attainment area for the federal 8-hour ozone standard. The basin is nonattainment for PM-2.5 and has been determined by ARB to be in attainment of federal PM-10 standards. Based upon these designations, the following emissions levels are presumed evidence of SIP conformity:[2]

Ozone	10 tons/year
Carbon Monoxide	100 tons/year
PM-10	100 tons/year
PM-2.5	100 tons/year
NOx	10 tons/year

These *de minimis* thresholds are less stringent than the SJVAPCD CEQA thresholds. If project air quality impacts in the basin are less-than-significant under CEQA, they are automatically in conformance under NEPA.

[2] https://www.epa.gov/general-conformity/de-minimis-tables

AIR QUALITY IMPACT

CONSTRUCTION ACTIVITY IMPACTS

CalEEMod2020.4.0 was developed by the SCAQMD to provide a model by which to calculate both construction emissions and operational emissions from a variety of land use projects. It calculates both the daily maximum and annual average emissions for criteria pollutants as well as total or annual greenhouse gas (GHG) emissions.

The proposed project consists of replacement of a small, poorly performing wastewater treatment plant (WWTP) and installation of support facilities required to allow the Buttonwillow County Water District to meet waste discharge requirements with the treated effluent.

After evaluation of several alternatives, the Biolac Extended Aeration System, was selected as the recommended system for treatment and disposal. The Biolac system primarily consists of a concrete-lined aeration pond with two circular clarifiers.

Project engineering broke construction into three major activities. Excavation, concrete work, and equipment installation. The breakdown is shown below. For modeling purposes, the total number of hours for each piece of equipment was determined by phase and divided by the number of days in the phase for a daily average. This breakdown by construction phase is shown in Table 5.

Table 5
Excavation/Earthworks

Activity	Equipment	Hours/Day	Number of Days
Influent Pump Station	None	-	-
Headworks	Excavator, Loader, Water Truck	8	2
Biolac Pond	Scraper, Blade, Water Truck	8	8
Clarifiers	Excavator, Loader, Water Truck	8	3
RAS/WAS Pump Station	Excavator, Loader, Water Truck	8	2
Sludge Digester	Excavator, Loader, Water Truck	8	2
Sludge Drying Beds	Excavator, Loader, Water Truck	8	4
Yard piping	Backhoe, Loader, Water Truck	4	20
Misc site work	Backhoe, Loader, Water Truck	4	4

Excavation/Earthworks Phase Summary: Average for 45 days of activity

Equipment	Total Hours for Phase	Average Hrs/Day
Excavator	104	2.3
Loader	200	4.4
Water Truck	264	5.9
Backhoe	96	2.1
Scraper	64	1.4
Blade	64	1.4

Table 5 (continued)
Concrete Work

Activity	Equipment	Hours/Day	Number of Days
Headworks	Concrete Pump, Trucks	8	1
Biolac Pond	None	-	-
Clarifiers	Concrete Pump, Trucks	8	2
RAS/WAS Pump Station	Concrete Pump, Trucks	8	1
Sludge Digester	Concrete Pump, Trucks	8	1
Sludge Drying Beds	Concrete Pump, Trucks	8	2
AC Pavement	Paving Machine, Roller, Skip Loader	8	1

Concrete Work Phase Summary: Average for 8 days of activity

Equipment	Total Hours for Phase	Average Hrs/Day
Concrete Pump	56	7.0
Truck	56	7.0
Paving Machine	8	1.0
Drum Roller	8	1.0
Skip Loader	8	1.0

Table 5 (continued)
Equipment Installation

Activity	Equipment	Hours/Day	Number of Days
Influent Pumps	Crane, Forklift	4	2
Headworks Screen	Crane, Forklift	8	1
Biolac Blowers	Crane, Forklift	4	3
Biolac diffuser tubes	Crane, Forklift	8	1
Clarifier Mechanism	Crane, Forklift	8	2
RAS/WAS Pumps	Crane, Forklift	8	1
Sludge Blowers	Crane, Forklift	8	2
Major Yard Piping	Backhoe, Forklift	3	40

Equipment Installation Phase Summary: Average for 52 days of activity

Equipment	Total Hours for Phase	Average Hrs/Day
Concrete Pump	56	7.0
Truck	56	7.0
Paving Machine	8	1.0
Drum Roller	8	1.0
Skip Loader	8	1.0

Utilizing the equipment fleet and durations shown in Table 5, the annual construction emissions are calculated by CalEEMod2020.4.0. and are shown in Table 6. The emissions are compared to the NEPA and JQVAPCD thresholds.

Table 6
Construction Activity Emissions
Maximum Annual Emissions (tons/year)

Maximal Construction Emissions	**ROG**	**NOx**	**CO**	**SO_2**	**PM-10**	**PM-2.5**
Excavation/Earthworks	0.02	0.16	0.16	<0.01	0.11	0.06
Concrete Work	<0.01	0.04	0.03	<0.01	0.11	0.06
Equipment Installation	<0.01	0.05	0.05	<0.01	<0.01	<0.01
NEPA Threshold	10	10	100	100	100	100
JQVAPCD Regional Emissions Threshold	10	10	100	27	15	15

Source: CalEEMod output in appendix

The three phases would be performed sequentially. However, even if they were to overlap, annual emissions would remain below CEQA and NEPA thresholds without the need for added mitigation. There are no standards for daily emissions.

OPERATIONAL IMPACTS

No new operators will be required a result of this project. Existing personnel will be trained to the level of certification required.

CONSTRUCTION EMISSIONS MINIMIZATION

Construction activities are not anticipated to cause emissions to exceed CEQA or NEPA thresholds. Nevertheless, emissions minimization through enhanced dust control measures is required to comply with SJVAPCD Regulation VIII related to dust control.

Regulation VIII Control Measures for Construction Emissions of PM-10

- 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.
- All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.
- 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.
- With the demolition of buildings up to six stories in height, all exterior surfaces of the building shall be wetted during demolition.
- 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.
- 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.)
- 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.
- Within urban areas, trackout shall be immediately removed when it extends 50 or more feet from the site and at the end of each workday.
- An owner/operator of any site with 150 or more vehicle trips per day, or 20 or more vehicle trips per day by vehicles with three or more axles shall implement measures to prevent carryout and trackout.

Recommended Enhanced Additional Measures for Construction Emissions of PM-10

- Install wheel washers for all exiting trucks or wash off all trucks and equipment leaving the site.
- Install wind breaks at windward side(s) of construction areas.
- Suspend excavation and grading activity when winds exceed 20 mph.
- Limit area subject to excavation, grading, and other construction activity at any one time.

Recommended for Heavy Duty Equipment (scrapers, graders, trenchers, earth movers, etc.)

- Use alternative fueled or catalyst equipped diesel construction equipment.
- Minimize idling time (e.g., 5 minutes maximum).
- Limit the hours of operation of heavy-duty equipment and/or the amount of equipment in use.
- Replace fossil-fueled equipment with electrically driven equivalents (provided they are not run via a portable generator set).
- Curtail construction during periods of high ambient pollutant concentrations; this may include ceasing of construction activity during the peak-hour of vehicular traffic on adjacent roadways.
- Implement activity management (e.g. rescheduling activities to reduce short-term impacts).

GREENHOUSE GAS EMISSIONS

"Greenhouse gases" (so called because of their role in trapping heat near the surface of the earth) emitted by human activity are implicated in global climate change, commonly referred to as "global warming." These greenhouse gases contribute to an increase in the temperature of the earth's atmosphere by transparency to short wavelength visible sunlight, but near opacity to outgoing terrestrial long wavelength heat radiation in some parts of the infrared spectrum. The principal greenhouse gases (GHGs) are carbon dioxide, methane, nitrous oxide, ozone, and water vapor. For purposes of planning and regulation, Section 15364.5 of the California Code of Regulations defines GHGs to include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride. Fossil fuel consumption in the transportation sector (on-road motor vehicles, off-highway mobile sources, and aircraft) is the single largest source of GHG emissions, accounting for approximately half of GHG emissions globally. Industrial and commercial sources are the second largest contributors of GHG emissions with about one-fourth of total emissions.

California has passed several bills and the Governor has signed at least three executive orders regarding greenhouse gases. GHG statues and executive orders (EO) include AB 32, SB 1368, EO S-03-05, EO S-20-06 and EO S-01-07.

AB 32 is one of the most significant pieces of environmental legislation that California has adopted. Among other things, it is designed to maintain California's reputation as a "national and international leader on energy conservation and environmental stewardship." It will have wide-ranging effects on California businesses and lifestyles as well as far reaching effects on other states and countries. A unique aspect of AB 32, beyond its broad and wide-ranging mandatory provisions and dramatic GHG reductions are the short time frames within which it must be implemented. Major components of the AB 32 include:

- Requires the monitoring and reporting of GHG emissions beginning with sources or categories of sources that contribute the most to statewide emissions.
- Requires immediate "early action" control programs on the most readily controlled GHG sources.
- Mandates that by 2020, California's GHG emissions be reduced to 1990 levels.
- Forces an overall reduction of GHG gases in California by 25-40%, from business as usual practices by 2020.
- Dictates that any local initiatives must complement efforts to achieve and maintain federal and state ambient air quality standards and to reduce toxic air contaminants.

Statewide, the framework for developing the implementing regulations for AB 32 is under way. Maximum GHG reductions are expected to derive from increased vehicle fuel efficiency, from greater use of renewable energy and from increased structural energy efficiency.

GREENHOUSE GAS EMISSIONS SIGNIFICANCE THRESHOLDS

In response to the requirements of SB97, the State Resources Agency developed guidelines for the treatment of GHG emissions under CEQA. These new guidelines became state laws as part of Title 14 of the California Code of Regulations in March, 2010. The CEQA Appendix G guidelines were modified to include GHG as a required analysis element. A project would have a potentially significant impact if it:

- Generates GHG emissions, directly or indirectly, that may have a significant impact on the environment, or,

- Conflicts with an applicable plan, policy or regulation adopted to reduce GHG emissions.

Section 15064.4 of the Code specifies how significance of GHG emissions is to be evaluated. The process is broken down into quantification of project-related GHG emissions, making a determination of significance, and specification of any appropriate mitigation if impacts are found to be potentially significant. At each of these steps, the new GHG guidelines afford the lead agency with substantial flexibility.

Emissions identification may be quantitative, qualitative or based on performance standards. CEQA guidelines allow the lead agency to "select the model or methodology it considers most appropriate". The most common practice for transportation/combustion GHG emissions quantification is to use a computer model such as CalEEMod, as was used in the ensuing analysis.

In the Final Staff Report Addressing GHG Emissions Impacts under CEQA, the SJVAPCD notes that ARB staff derived a proposed hybrid threshold consisting of a quantitative threshold of 7,000 metric tons of CO_2 equivalent per year ($MTCO_2E$/year) for operational emissions (excluding transportation), and performance standards for construction and transportation emissions (CARB).

ARB concludes in its draft proposal that the 7,000 $MTCO_2E$/year benchmark can be used to effectively mitigate industrial projects with significant GHG emissions. To date, ARB has not finalized its draft proposed threshold, nor has ARB scheduled additional workshops to seek public input on establishing a significance threshold for assessing significance of project specific GHG emission impacts on global climate change. However, in the absence of any other guidance, this 7,000 MT per year recommendation has been used as a guideline for this analysis.

PROJECT RELATED GHG EMISSIONS GENERATION

Construction Activity GHG Emissions

The project is assumed to require less than one year for construction. During project construction, the CalEEMod2020.4.0 computer model predicts the emissions shown in Table 7.

Table 7
Annual Construction GHG Emissions

Activity	$MTCO_2e$/year
Excavation/Earthworks	37.0
Concrete Work	13.5
Equipment Installation	8.3
Total	**58.8**

The annual total of almost 59 MT CO_2e is much less than the adopted threshold for use by this project. GHG impacts from construction are considered less-than-significant.

CONSISTENCY WITH EXISTING AIR QUALITY PLANS

In December 2009 the SJVAPCD issued a final staff report addressing greenhouse gas emissions under CEQA. That only language directly related to this Project states that the lead agency should identify GHG emissions based on available information to calculate, model, or estimate the amount of CO_2 and other GHG emissions.

With regard to consistency with existing air quality plans, it was determined that because the proposed project would not generate population, residences, or substantial employment, it would neither conflict with nor interfere with the County's adopted growth forecast. Furthermore, as shown in this report, the proposed project's contribution to regional air emissions in the San Joaquin Valley would be very small. When compliance with applicable rules, such as the SJVAPCD's required emissions controls is considered, the proposed project's regional contribution to cumulative air quality impacts would be almost negligible.

CALEEMOD2020.4.0 COMPUTER MODEL OUTPUT

- EXCAVATION/EARTHWORKS ANNUAL EMISSIONS
- CONCRETE WORK ANNUAL EMISSIONS
- EQUIPMENT INSTALLATION ANNUAL EMISSIONS

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Buttonwillow Excavation/Earthworks

Kern-San Joaquin County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	1.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	32
Climate Zone	3			**Operational Year**	2023
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - less than one acre

Construction Phase - Phase length is 45 days

Off-road Equipment - Equipment list provided by applicant

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	2.00	45.00
tblConstructionPhase	PhaseEndDate	1/18/2023	3/20/2023
tblGrading	AcresOfGrading	33.75	1.50
tblLandUse	LotAcreage	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks

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tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes
tblOffRoadEquipment	OffRoadEquipmentType		Scrapers
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Dozers
tblOffRoadEquipment	PhaseName		Grading
tblOffRoadEquipment	PhaseName		Grading
tblOffRoadEquipment	PhaseName		Grading
tblOffRoadEquipment	PhaseName		Grading
tblOffRoadEquipment	PhaseName		Grading
tblOffRoadEquipment	UsageHours	7.00	4.40

2.0 Emissions Summary

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.0187	0.1585	0.1574	4.2000e-004	0.1039	6.5700e-003	0.1104	0.0563	6.0400e-003	0.0624	0.0000	36.6733	36.6733	0.0115	3.0000e-005	36.9711
Maximum	**0.0187**	**0.1585**	**0.1574**	**4.2000e-004**	**0.1039**	**6.5700e-003**	**0.1104**	**0.0563**	**6.0400e-003**	**0.0624**	**0.0000**	**36.6733**	**36.6733**	**0.0115**	**3.0000e-005**	**36.9711**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.0187	0.0561	0.1574	4.2000e-004	0.1039	6.5700e-003	0.1104	0.0563	6.0400e-003	0.0624	0.0000	36.6732	36.6732	0.0115	3.0000e-005	36.9711
Maximum	**0.0187**	**0.0561**	**0.1574**	**4.2000e-004**	**0.1039**	**6.5700e-003**	**0.1104**	**0.0563**	**6.0400e-003**	**0.0624**	**0.0000**	**36.6732**	**36.6732**	**0.0115**	**3.0000e-005**	**36.9711**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**64.58**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-1-2023	3-31-2023	0.1772	0.0749
		Highest	0.1772	0.0749

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	1/17/2023	3/20/2023	5	45	

Acres of Grading (Site Preparation Phase): 0

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Acres of Grading (Grading Phase): 1.5

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	1	2.30	158	0.38
Grading	Off-Highway Trucks	1	5.90	402	0.38
Grading	Tractors/Loaders/Backhoes	1	2.10	97	0.37
Grading	Scrapers	1	1.40	367	0.48
Grading	Rubber Tired Dozers	1	1.40	247	0.40
Grading	Tractors/Loaders/Backhoes	1	4.40	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	3	8.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Grading - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1024	0.0000	0.1024	0.0560	0.0000	0.0560	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0182	0.1581	0.1531	4.0000e-004		6.5600e-003	6.5600e-003		6.0400e-003	6.0400e-003	0.0000	35.5047	35.5047	0.0115	0.0000	35.7917
Total	**0.0182**	**0.1581**	**0.1531**	**4.0000e-004**	**0.1024**	**6.5600e-003**	**0.1090**	**0.0560**	**6.0400e-003**	**0.0620**	**0.0000**	**35.5047**	**35.5047**	**0.0115**	**0.0000**	**35.7917**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.3000e-004	3.6000e-004	4.2900e-003	1.0000e-005	1.4500e-003	1.0000e-005	1.4600e-003	3.9000e-004	1.0000e-005	3.9000e-004	0.0000	1.1686	1.1686	4.0000e-005	3.0000e-005	1.1794
Total	**5.3000e-004**	**3.6000e-004**	**4.2900e-003**	**1.0000e-005**	**1.4500e-003**	**1.0000e-005**	**1.4600e-003**	**3.9000e-004**	**1.0000e-005**	**3.9000e-004**	**0.0000**	**1.1686**	**1.1686**	**4.0000e-005**	**3.0000e-005**	**1.1794**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Grading - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1024	0.0000	0.1024	0.0560	0.0000	0.0560	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0182	0.0558	0.1531	4.0000e-004		6.5600e-003	6.5600e-003		6.0400e-003	6.0400e-003	0.0000	35.5046	35.5046	0.0115	0.0000	35.7917
Total	**0.0182**	**0.0558**	**0.1531**	**4.0000e-004**	**0.1024**	**6.5600e-003**	**0.1090**	**0.0560**	**6.0400e-003**	**0.0620**	**0.0000**	**35.5046**	**35.5046**	**0.0115**	**0.0000**	**35.7917**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.3000e-004	3.6000e-004	4.2900e-003	1.0000e-005	1.4500e-003	1.0000e-005	1.4600e-003	3.9000e-004	1.0000e-005	3.9000e-004	0.0000	1.1686	1.1686	4.0000e-005	3.0000e-005	1.1794
Total	**5.3000e-004**	**3.6000e-004**	**4.2900e-003**	**1.0000e-005**	**1.4500e-003**	**1.0000e-005**	**1.4600e-003**	**3.9000e-004**	**1.0000e-005**	**3.9000e-004**	**0.0000**	**1.1686**	**1.1686**	**4.0000e-005**	**3.0000e-005**	**1.1794**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.475755	0.052577	0.176436	0.169714	0.032065	0.009816	0.013925	0.037355	0.000591	0.000241	0.025277	0.001517	0.004732

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

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

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5.2 Energy by Land Use - NaturalGas

Unmitigated

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

Mitigated

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

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Unmitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

7.0 Water Detail

7.1 Mitigation Measures Water

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

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

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

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

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Buttonwillow Concrete Work

Kern-San Joaquin County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	1.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	32
Climate Zone	3			**Operational Year**	2023
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - less than one acre

Construction Phase - Phase length is 8 days

Off-road Equipment - Equipment list provided by applicant

Trips and VMT - 50 haul trips, 60 miles RT

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	2.00	8.00
tblConstructionPhase	PhaseEndDate	1/18/2023	4/12/2023
tblConstructionPhase	PhaseStartDate	1/17/2023	4/1/2023
tblGrading	AcresOfGrading	33.75	1.50
tblLandUse	LotAcreage	0.00	1.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Rollers
tblOffRoadEquipment	OffRoadEquipmentType		Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Paving Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Grading
tblOffRoadEquipment	PhaseName		Grading
tblOffRoadEquipment	PhaseName		Grading
tblOffRoadEquipment	PhaseName		Grading
tblOffRoadEquipment	PhaseName		Grading
tblTripsAndVMT	HaulingTripLength	20.00	60.00
tblTripsAndVMT	HaulingTripNumber	0.00	80.00

2.0 Emissions Summary

Buttonwillow Concrete Work - Kern-San Joaquin County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	3.3600e-003	0.0374	0.0300	1.4000e-004	0.1047	1.1700e-003	0.1059	0.0566	1.1200e-003	0.0577	0.0000	13.1180	13.1180	1.5500e-003	1.0300e-003	13.4625
Maximum	**3.3600e-003**	**0.0374**	**0.0300**	**1.4000e-004**	**0.1047**	**1.1700e-003**	**0.1059**	**0.0566**	**1.1200e-003**	**0.0577**	**0.0000**	**13.1180**	**13.1180**	**1.5500e-003**	**1.0300e-003**	**13.4625**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	3.3600e-003	0.0133	0.0300	1.4000e-004	0.1047	1.1700e-003	0.1059	0.0566	1.1200e-003	0.0577	0.0000	13.1179	13.1179	1.5500e-003	1.0300e-003	13.4624
Maximum	**3.3600e-003**	**0.0133**	**0.0300**	**1.4000e-004**	**0.1047**	**1.1700e-003**	**0.1059**	**0.0566**	**1.1200e-003**	**0.0577**	**0.0000**	**13.1179**	**13.1179**	**1.5500e-003**	**1.0300e-003**	**13.4624**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**64.48**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Buttonwillow Concrete Work - Kern-San Joaquin County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
2	4-1-2023	6-30-2023	0.0430	0.0171
		Highest	0.0430	0.0171

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	4/1/2023	4/12/2023	5	8	

Acres of Grading (Site Preparation Phase): 0

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Acres of Grading (Grading Phase): 1.5

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Off-Highway Trucks	1	7.00	402	0.38
Grading	Rollers	1	1.00	80	0.38
Grading	Skid Steer Loaders	1	1.00	65	0.37
Grading	Paving Equipment	1	1.00	132	0.36
Grading	Pumps	1	7.00	84	0.74

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	3	8.00	0.00	80.00	10.80	7.30	60.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Grading - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1024	0.0000	0.1024	0.0560	0.0000	0.0560	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.1000e-003	0.0241	0.0274	7.0000e-005		1.0200e-003	1.0200e-003		9.8000e-004	9.8000e-004	0.0000	6.4229	6.4229	1.5300e-003	0.0000	6.4611
Total	**3.1000e-003**	**0.0241**	**0.0274**	**7.0000e-005**	**0.1024**	**1.0200e-003**	**0.1034**	**0.0560**	**9.8000e-004**	**0.0569**	**0.0000**	**6.4229**	**6.4229**	**1.5300e-003**	**0.0000**	**6.4611**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.6000e-004	0.0132	1.8400e-003	7.0000e-005	2.0700e-003	1.4000e-004	2.2100e-003	5.7000e-004	1.4000e-004	7.1000e-004	0.0000	6.4873	6.4873	2.0000e-005	1.0200e-003	6.7917
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.0000e-005	6.0000e-005	7.6000e-004	0.0000	2.6000e-004	0.0000	2.6000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.2078	0.2078	1.0000e-005	1.0000e-005	0.2097
Total	**2.5000e-004**	**0.0133**	**2.6000e-003**	**7.0000e-005**	**2.3300e-003**	**1.4000e-004**	**2.4700e-003**	**6.4000e-004**	**1.4000e-004**	**7.8000e-004**	**0.0000**	**6.6950**	**6.6950**	**3.0000e-005**	**1.0300e-003**	**7.0013**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Grading - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1024	0.0000	0.1024	0.0560	0.0000	0.0560	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.1000e-003		0.0274	7.0000e-005		1.0200e-003	1.0200e-003		9.8000e-004	9.8000e-004	0.0000	6.4229	6.4229	1.5300e-003	0.0000	6.4611
Total	**3.1000e-003**		**0.0274**	**7.0000e-005**	**0.1024**	**1.0200e-003**	**0.1034**	**0.0560**	**9.8000e-004**	**0.0569**	**0.0000**	**6.4229**	**6.4229**	**1.5300e-003**	**0.0000**	**6.4611**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.6000e-004	0.0132	1.8400e-003	7.0000e-005	2.0700e-003	1.4000e-004	2.2100e-003	5.7000e-004	1.4000e-004	7.1000e-004	0.0000	6.4873	6.4873	2.0000e-005	1.0200e-003	6.7917
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.0000e-005	6.0000e-005	7.6000e-004	0.0000	2.6000e-004	0.0000	2.6000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.2078	0.2078	1.0000e-005	1.0000e-005	0.2097
Total	**2.5000e-004**	**0.0133**	**2.6000e-003**	**7.0000e-005**	**2.3300e-003**	**1.4000e-004**	**2.4700e-003**	**6.4000e-004**	**1.4000e-004**	**7.8000e-004**	**0.0000**	**6.6950**	**6.6950**	**3.0000e-005**	**1.0300e-003**	**7.0013**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.475755	0.052577	0.176436	0.169714	0.032065	0.009816	0.013925	0.037355	0.000591	0.000241	0.025277	0.001517	0.004732

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

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

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.2 Energy by Land Use - NaturalGas

Unmitigated

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

Mitigated

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

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Unmitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

7.0 Water Detail

7.1 Mitigation Measures Water

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

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

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

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

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Buttonwillow Equipment Installation - Kern-San Joaquin County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Buttonwillow Equipment Installation

Kern-San Joaquin County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	1.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	32
Climate Zone	3			**Operational Year**	2023
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - less than one acre

Construction Phase - 52 days construction

Off-road Equipment - equipment list provided by applicant

Trips and VMT -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	52.00
tblConstructionPhase	PhaseEndDate	3/31/2023	6/13/2023
tblOffRoadEquipment	OffRoadEquipmentType		Cranes
tblOffRoadEquipment	OffRoadEquipmentType		Rough Terrain Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes

Buttonwillow Equipment Installation - Kern-San Joaquin County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	PhaseName		Building Construction
tblOffRoadEquipment	PhaseName		Building Construction
tblOffRoadEquipment	PhaseName		Building Construction

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	4.1400e-003	0.0473	0.0539	9.0000e-005	0.0000	1.8900e-003	1.8900e-003	0.0000	1.7400e-003	1.7400e-003	0.0000	8.2505	8.2505	2.6700e-003	0.0000	8.3172
Maximum	**4.1400e-003**	**0.0473**	**0.0539**	**9.0000e-005**	**0.0000**	**1.8900e-003**	**1.8900e-003**	**0.0000**	**1.7400e-003**	**1.7400e-003**	**0.0000**	**8.2505**	**8.2505**	**2.6700e-003**	**0.0000**	**8.3172**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	4.1400e-003		0.0539	9.0000e-005	0.0000	1.8900e-003	1.8900e-003	0.0000	1.7400e-003	1.7400e-003	0.0000	8.2505	8.2505	2.6700e-003	0.0000	8.3172
Maximum	**4.1400e-003**		**0.0539**	**9.0000e-005**	**0.0000**	**1.8900e-003**	**1.8900e-003**	**0.0000**	**1.7400e-003**	**1.7400e-003**	**0.0000**	**8.2505**	**8.2505**	**2.6700e-003**	**0.0000**	**8.3172**

Buttonwillow Equipment Installation - Kern-San Joaquin County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**100.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**4-1-2023**	**6-30-2023**	0.0523	0.0042
		Highest	0.0523	0.0042

Buttonwillow Equipment Installation - Kern-San Joaquin County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.2 Overall Operational

Unmitigated Operational

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

Mitigated Operational

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

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

3.0 Construction Detail

Buttonwillow Equipment Installation - Kern-San Joaquin County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Building Construction	Building Construction	4/1/2023	6/13/2023	5	52	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Building Construction	Cranes	1	1.50	231	0.29
Building Construction	Rough Terrain Forklifts	1	3.80	100	0.40
Building Construction	Tractors/Loaders/Backhoes	1	2.30	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Building Construction	0	30.00	2.00							

3.1 Mitigation Measures Construction

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.1400e-003	0.0473	0.0539	9.0000e-005		1.8900e-003	1.8900e-003		1.7400e-003	1.7400e-003	0.0000	8.2505	8.2505	2.6700e-003	0.0000	8.3172
Total	**4.1400e-003**	**0.0473**	**0.0539**	**9.0000e-005**		**1.8900e-003**	**1.8900e-003**		**1.7400e-003**	**1.7400e-003**	**0.0000**	**8.2505**	**8.2505**	**2.6700e-003**	**0.0000**	**8.3172**

Unmitigated Construction Off-Site

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

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Building Construction - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.1400e-003		0.0539	9.0000e-005		1.8900e-003	1.8900e-003		1.7400e-003	1.7400e-003	0.0000	8.2505	8.2505	2.6700e-003	0.0000	8.3172
Total	**4.1400e-003**		**0.0539**	**9.0000e-005**		**1.8900e-003**	**1.8900e-003**		**1.7400e-003**	**1.7400e-003**	**0.0000**	**8.2505**	**8.2505**	**2.6700e-003**	**0.0000**	**8.3172**

Mitigated Construction Off-Site

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

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Total					

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

6.0 Area Detail

6.1 Mitigation Measures Area

Buttonwillow Equipment Installation - Kern-San Joaquin County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**					**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Buttonwillow Equipment Installation - Kern-San Joaquin County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**					**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.0 Water Detail

7.1 Mitigation Measures Water

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX 3a

PO BOX 37
O' Neals, CA 93645 USA
909.838.1333

Buttonwillow BRA

Date:	June 6, 2022
Project name:	TDA - Button Willow
Project no:	W3X83304
Attention:	Tom Dodson
Company:	Tom Dodson & Associate:
Prepared by:	Lisa Patterson, Ecologist/ Regulatory Specialist
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1. Introduction and Summary of Findings

Jacobs Engineering Group was retained by Tom Dodson & Associates to conduct a Biological Resources Assessment (BRA) for the proposed Buttonwillow County Water District (BCWD) improvements to their existing Wastewater Treatment Plant (WTP) located in the unincorporated community of Buttonwillow, Kern County, California. BCWD is seeking funds for the proposed improvements from the State Revolving Funds administered by the State Water Resources Control Board (SWRCB).

Project Area was surveyed on April 5 and May 19, 2022, by Jacobs' biological and regulatory specialist Lisa Patterson. The focus of this Biological Resource Assessment to determine potential effects of the proposed Project on U.S. Fish and Wildlife Service (USFWS) designated Critical Habitats and/or any species currently listed or formally proposed for listing as endangered or threatened under the federal Endangered Species Act (ESA) and/or the California Endangered Species Act (CESA), as well as species designated as sensitive by the California Department of Fish and Wildlife (CDFW) or the California Native Plant Society (CNPS) and other potentially sensitive resources known to occur locally (within a 3-mile radius of the Project area boundaries). This report also addresses resources protected under the Coastal Barriers Resources Act, Coastal Zone Management Act, Magnuson-Stevens Fishery Conservation and Management Act, the Protection of Wetlands – Executive Order 11990, Migratory Bird Treaty Act and Wild and Scenic Rivers Act.

Jacobs conducted a jurisdictional waters assessment of the Project Area. The purpose of this assessment was to determine the presence and extent of any State and/or federal jurisdictional waters within the Project Area potentially subject to regulation by the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (CWA), Regional Water Quality Control Board (RWQCB) under Section 401 of the CWA and Porter Cologne Water Quality Control Act, and CDFW under Section 1602 of the California Fish and Game Code (FGC), respectively.

1.1 PROJECT LOCATION

The Project Area is located approximately 25 miles west of the City of Bakersfield in the unincorporated community of Buttonwillow, Kern County, California (Figure 1). The existing wastewater treatment plant (WTP) is located approximately 0.5 miles north of Buttonwillow, south of Sullivan Road, west of Wasco Way, north of the Buena Vista Water Storage District canal (East Side Canal) and east of Buttonwillow Drive (Figures 2 & 3). The Project site is mapped on the *Buttonwillow* Quadrangle of the U.S. Geological Survey's (USGS) 7.5-Minute Series Quadrangle map within Section 13, Township 29 South, Range 23 East, Mount Diablo Base and Meridian.

1.2 PROJECT DESCRIPTION

The BCWD is proposing improvements to their existing WTP to provide the necessary treatment upgrades to reliably meet Waste Discharge Requirements at a low operations and maintenance cost.

The proposed Project includes the construction of a 230-foot by 110-foot (1.3 million gallon) aeration pond system that consists of a lined pond with disposal to the existing disposal ponds in the WTP facility. Other ancillary facilities include: New headworks, pre-engineered building equipped for HVAC system, office space, laboratory, restroom, the motor control center, and electrical gear. The Project would also include an approximately 2-acre solar field located on the adjacent fallow agricultural parcel to the west side of the existing WTP. The WTP area, including the treatment

ponds, percolation ponds, emergency storage ponds, stormwater ponds, and solar panel area will be enclosed with chain-link fences.

The proposed project will also construct a potable water pipeline and a sewer pipeline. Approximately 2,600-feet of potable water pipeline between eh community of Buttonwillow and the WTP. Approximately 1,200 linear feet of sewer connection pipeline is proposed within the existing unpaved access road, connecting the facility to the existing sewer line in Meadow Street. Both pipelines will cross the Buena Vista Water Storage District East Side canal.

Finally, the proposed project includes paving the approximately 1,800-foot seasonal unpaved access road to the WTP from Sullivan Road.

1.3 ENVIRONMENTAL SETTING

The Project Area is within the Buttonwillow area of unincorporated Kern County, which is situated in the southern end of the San Joaquin Valley and is bound by the Coast Range to the west, the Transverse Range (San Emigdio Mountains) to the south, and the Sierra Nevada (including the Tehachapi Mountains) to the east. The Buttonwillow area is subject to an arid climate, with both seasonal and annual variations in temperature and precipitation. Average annual maximum temperatures within this region peak at 98.4 degrees Fahrenheit (° F) in July and fall to an average annual minimum temperature of 34.5° F in December. Average annual precipitation is greatest from November through April and reaches a peak in February (1.07 inches). Precipitation is lowest in the months of July and August (0.02 inches). Annual total precipitation averages 5.64 inches.

The topography of the Project Area is relatively flat, with an on-site elevation of approximately 275 feet above mean sea level (amsl). Hydrologically, the Project Area is situated within an undefined Hydrologic Sub-Area (HSA 558.70), which comprises an approximately 274,487-acre drainage area within the larger Tulare Lake Bed Watershed (HUC 18030012). Within the Project Area, the proposed water and sewer connection pipeline crosses the Buena Vista Water Storage District canal, which is a man-made irrigation ditch.

The primary soil types within the Project Area are Milham sandy loam, 0 to 2 percent slopes and Lokern clay, saline-alkali, drained. Milham sandy loam soils consist of sandy loam, loam and clay loams comprised of alluvium derived from igneous and sedimentary rock. This soil type typically occurs on terraces, alluvial fans, plains and fan remnants, is well drained with a medium runoff class and is considered prime farmland if irrigated. Lokern clay soils consist of clay and stratified fine sandy loam to sandy clay loam comprised of alluvium derived from granite. This soil type typically occurs on basin floors, is moderately well drained with a very high runoff class and is not considered prime farmland.

1.4 FINDINGS

The proposed Project is entirely within an existing developed/disturbed environment consisting of the existing WTP, agricultural fields and paved and unpaved roads (Figure 3). The surrounding land consists of agricultural, public utilities, and residential development and no longer supports any native habitats. Vegetation within the Project Area is either absent (i.e. the proposed solar field and pipeline alignment) or dominated by non-native, invasive and ruderal species. Therefore, there are no native habitat or sensitive species identified in the APE.

2. REGULATORY FRAMEWORK

2.1 Federal

2.1.1 Clean Water Act

The purpose of the Clean Water Act (CWA) (1977) is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." Section 404 of the CWA prohibits the discharge of dredged or fill material into "waters of the United States" without a permit from the United States Army Corps of Engineers (USACE). The definition of waters of the United States includes rivers, streams, estuaries, the territorial seas, ponds, lakes, and wetlands. Wetlands are defined as those areas "that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 Code of Federal Regulations [CFR] 328.3 7b). Section 401 of the CWA is required for Section 404 permit actions; in California Section 401 certification or a waiver is issued by the RWQCB.

In addition to the Section 404 and 401 regulating discharge of dredge or fill into Waters of the United States; 33 USC 408 (Chapter 9.1), Navigation and Navigable Waters. Section 408 states it is unlawful for any person(s) to build upon, alter, deface, destroy, move, injure, obstruct or… impair the usefulness of any levee or other work built by the U.S. That the Secretary may, on the recommendation of the Chief of Engineers, grant permission for the alteration or permanent occupation or use of any of the public works when in the judgment of the Secretary such occupation or use will not be injurious to the public interest and will not impair the usefulness of such work.

2.1.2 Rivers and Harbors Act 1899

Section 10 of the Rivers and Harbors Act of 1899 requires authorization from the USACE for the construction of any structure in or over any navigable waters of the U.S.

2.1.3 Wild and Scenic Rivers Act.

Wild and Scenic Rivers Act. The National Wild and Scenic Rivers System was created by Congress in 1968 (Public Law 90-542; 16 U.S.C. 1271 et seq.) to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. The Act is notable for safeguarding the special character of these rivers, while also recognizing the potential for their appropriate use and development. It encourages river management that crosses political boundaries and promotes public participation in developing goals for river protection. Rivers may be designated by either a federal or state agency. As of 2019, there were 22 water body sections that have a wild and scenic river designation in California.

2.1.4 Federal Endangered Species Act (ESA)

The federal Endangered Species Act (ESA) of 1973 protects plants and wildlife that are listed by the United States Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) as endangered or threatened. Section 9 of the ESA (USA) prohibits the taking of endangered wildlife, where taking is defined as any effort to "harass, harm, pursue, hunt, shoot, wound, kill, trap,

capture, collect, or attempt to engage in such conduct" (50 CFR 17.3). For plants, this statute governs removing, possessing, maliciously damaging, or destroying any endangered plant on federal land and removing, cutting, digging up, damaging, or destroying any endangered plant on non-federal land in knowing violation of state law (16 United States Code [USC] 1538). Under Section 7 of the ESA, federal agencies are required to consult with the USFWS if their actions, including permit approvals or funding, could adversely affect an endangered species (including plants) or its critical habitat. Through consultation and the issuance of a biological opinion, the USFWS may issue an incidental take statement allowing take of the species that is incidental to an otherwise authorized activity, provided the action will not jeopardize the continued existence of the species. The ESA specifies that the USFWS designate habitat for a species at the time of its listing in which are found the physical or biological features "essential to the conservation of the species," or which may require "special Management consideration or protection..." (16 USC § 1533[a][3].2; 16 USC § 1532[a]). This designated Critical Habitat is then afforded the same protection under the ESA as individuals of the species itself, requiring issuance of an Incidental Take Permit prior to any activity that results in "the destruction or adverse modification of habitat determined to be critical" (16 USC § 1536[a][2]).

2.1.5 Habitat Conservation Plans

Section 10 of the federal ESA requires the acquisition of an Incidental Take Permit (ITP) from the USFWS by non- federal landowners for activities that might incidentally harm (or "take") endangered or threatened wildlife on their land. To obtain a permit, an applicant must develop a Habitat Conservation Plan that is designed to offset any harmful impacts the proposed activity might have on the species.

2.1.6 Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (16 U.S.C. Sections 661 to 667e et seq.) applies to any federal project where any body of water is impounded, diverted, deepened, or otherwise modified. Project proponents are required to consult with the USFWS and the appropriate state wildlife agency.

2.1.7 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. Section 1801 et seq.) requires all federal agencies to consult with the NMFS on all actions or proposed actions (permitted, funded, or undertaken by the agency) that may adversely affect fish habitats. It also requires cooperation among NMFS, the councils, fishing participants, and federal and state agencies to protect, conserve, and enhance essential fish habitat, which is defined as those waters and substrates needed by fish for spawning, breeding, feeding, and growth to maturity.

2.1.8 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (The Eagle Act) (1940), amended in 1962, was originally implemented for the protection of bald eagles (Haliaeetus leucocephalus). In 1962, Congress amended the Eagle Act to cover golden eagles (Aquila chrysaetos), a move that was partially an attempt to strengthen protection of bald eagles, since the latter were often killed by people mistaking them for golden eagles. This act makes it illegal to import, export, take (molest or disturb), sell,

purchase, or barter any bald eagle or golden eagle or part thereof. The golden eagle, however, is accorded somewhat lighter protection under the Eagle Act than that of the bald eagle.

2.1.9 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) (1918) implements international treaties between the United States and other nations created to protect migratory birds, any of their parts, eggs, and nests from activities, such as hunting, pursuing, capturing, killing, selling, and shipping, unless expressly authorized in the regulations or by permit. As authorized by the MBTA, the USFWS issues permits to qualified applicants for the following types of activities: falconry, raptor propagation, scientific collecting, special purposes (rehabilitation, education, migratory game bird propagation, and salvage), take of depredating birds, taxidermy, and waterfowl sale and disposal. The regulations governing migratory bird permits can be found in 50 CFR Part 13 General Permit Procedures and 50 CFR part 21 Migratory Bird Permits. The State of California has incorporated the protection of birds of prey in Sections 3800, 3513, and 3503.5 of the California Fish and Game Code (CFGC).

2.1.10 Coastal Barriers Resources Act Resources

The Coastal Barrier Resources Act (CBRA) was passed by Congress in 1982 to encourage conservation of hurricane-prone, biologically rich coastal barriers. CBRA prohibits most new federal expenditures that encourage development or modification of coastal barriers. CBRS boundaries are shown on maps that were originally adopted by Congress and are maintained by the USFWS.

Currently, the coastal barrier resource systems are located along the Atlantic and Gulf Coasts of the United States and the shore areas of the Great Lakes. Therefore, the Project is not located in a Coastal Barriers Resources Act area.

2.1.11 Coastal Zone Management Act Resources

Coastal Zone Management Act was passed by Congress in 1972 and is administered by National Oceanic and Atmospheric Administration, (NOAA). It provides for the management of the nation's coastal resources, including the Great Lakes. The goal is to "preserve, protect, develop, and where possible, to restore or enhance the resources of the nation's coastal zone."

2.1.12 Executive Orders (EO)

Invasive Species—Executive Order 13112 (1999)

Issued on February 3, 1999, promotes the prevention and introduction of invasive species and provides for their control and minimizes the economic, ecological, and human health impacts that invasive species cause through the creation of the Invasive Species Council and Invasive Species Management Plan.

Protection of Wetlands—Executive Order 11990 (1977)

Issued on May 24, 1977, helps avoid the long-term and short-term adverse impacts associated with destroying or modifying wetlands and avoiding direct or indirect support of new construction in wetlands when there is a practicable alternative. Protection of Wetlands – Executive Order 11990: The purpose of Executive Order (EO) 11990 is to "minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands". To meet these objectives, the Order requires federal agencies, in planning their actions, to consider alternatives to

wetland sites and limit potential damage if an activity affecting a wetland cannot be avoided. The procedures require the determination of whether or not the proposed project will be in or will affect wetlands. If so, a wetlands assessment must be prepared that describes the alternatives considered. The procedures include a requirement for public review of assessments. The evaluation process follows the same 8 steps as for EO 11988, Floodplain Management.

Migratory Bird—EO 13186 (2001)

Issued on January 10, 2001, promotes the conservation of migratory birds and their habitats and directs federal agencies to implement the Migratory Bird Treaty Act. Protection and Enhancement of Environmental Quality—EO 11514 (1970a), issued on March 5, 1970, supports the purpose and policies of the National Environmental Policy Act (NEPA) and directs federal agencies to take measures to meet national environmental goals.

2.1.13 Migratory Bird Treaty Reform Act

The Migratory Bird Treaty Reform Act (Division E, Title I, Section 143 of the Consolidated Appropriations Act, 2005, PL 108–447) amends the Migratory Bird Treaty Act (16 U.S.C. Sections 703 to 712) such that nonnative birds or birds that have been introduced by humans to the United States or its territories are excluded from protection under the Act. It defines a native migratory bird as a species present in the United States and its territories as a result of natural biological or ecological processes. This list excluded two additional species commonly observed in the United States, the rock pigeon (Columba livia) and domestic goose (Anser domesticus).

2.2 State of California

2.2.1 Sections 1600 through 1606 of the California Fish and Game Code (CFGC)

This section requires that a Streambed Alteration Application be submitted to the CDFW for “any activity that may substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake.” The CDFW reviews the proposed actions and, if necessary, submits to the applicant a proposal for measures to protect affected fish and wildlife resources. The final proposal that is mutually agreed upon by the Department and the applicant is the Streambed Alteration Agreement. Often, projects that require a Streambed Alteration Agreement also require a permit from the USACE under Section 404 of the CWA. In these instances, the conditions of the Section 404 permit and the Streambed Alteration Agreement may overlap.

2.2.2 California Endangered Species Act

The California Endangered Species Act (CESA) (Sections 2050 to 2085) establishes the policy of the state to conserve, protect, restore, and enhance threatened or endangered species and their habitats by protecting “all native species of fishes, amphibians, reptiles, birds, mammals, invertebrates, and plants, and their habitats, threatened with extinction and those experiencing a significant decline which, if not halted, would lead to a threatened or endangered designation.” Animal species are listed by the CDFW as threatened or endangered, and plants are listed as rare, threatened, or endangered. However, only those plant species listed as threatened or endangered receive protection under the California ESA.

CESA mandates that state agencies do not approve a Project that would jeopardize the continued existence of these species if reasonable and prudent alternatives are available that would avoid a jeopardy finding. There are no state agency consultation procedures under the California ESA. For Projects that would affect a species that is federally and State listed, compliance with ESA satisfies the California ESA if the California Department of Fish and Wildlife (CDFW) determines that the federal incidental take authorization is consistent with the California ESA under Section 2080.1. For Projects that would result in take of a species that is state listed only, the Project sponsor must apply for a take permit, in accordance with Section 2081(b).

2.2.3 Fully Protected Species

Four sections of the California Fish and Game Code (CFGC) list 37 fully protected species (CFGC Sections 3511, 4700, 5050, and 5515). These sections prohibit take or possession "at any time" of the species listed, with few exceptions, and state that "no provision of this code or any other law will be construed to authorize the issuance of permits or licenses to 'take' the species," and that no previously issued permits or licenses for take of the species "shall have any force or effect" for authorizing take or possession.

2.2.4 Bird Nesting Protections

Bird nesting protections (Sections 3503, 3503.5, 3511, 3513 and 3800) in the CFGC include the following:

- Section 3503 prohibits the take, possession, or needless destruction of the nest or eggs of any bird.
- Section 3503.5 prohibits the take, possession, or needless destruction of any nests, eggs, or birds in the orders Falconiformes (new world vultures, hawks, eagles, ospreys, and falcons, among others), and Strigiformes (owls).
- Section 3511 prohibits the take or possession of Fully protected birds.
- Section 3513 prohibits the take or possession of any migratory nongame bird or part thereof, as designated in the MBTA. To avoid violation of the take provisions, it is generally required that Project-related disturbance at active nesting territories be reduced or eliminated during the nesting cycle.

Section 3800 prohibits the take of any non-game bird (i.e., bird that is naturally occurring in California that is not a gamebird, migratory game bird, or fully protected bird).

2.2.5 CA Migratory Bird Act -Assembly Bill 454

Existing federal law, the Migratory Bird Treaty Act, provides for the protection of migratory birds, as specified. The federal act also authorizes states and territories of the United States to make and enforce laws or regulations that give further protection to migratory birds, their nests, and eggs. Existing state law makes unlawful the taking or possession of any migratory nongame bird, or part of any migratory nongame bird, as designated in the federal act, except as provided by rules and regulations adopted by the United States Secretary of the Interior under provisions of the federal act……. (a) It is unlawful to take or possess any migratory nongame bird as designated in the federal Migratory Bird Treaty Act (16 U.S.C. Sec. 703 et seq.), or any part of a migratory nongame

bird described in this section, except as provided by rules and regulations adopted by the United States Secretary of the Interior under that federal act.

2.2.6 Native Plant Protection Act

The Native Plant Protect Act (NPPA) (1977) (CFGC Sections 1900-1913) was created with the intent to "preserve, protect, and enhance rare and endangered plants in this State." The NPPA is administered by CDFW. The Fish and Game Commission has the authority to designate native plants as endangered or rare and to protect endangered and rare plants from take. CESA (CFGC 2050-2116) provided further protection for rare and endangered plant species, but the NPPA remains part of the Fish and Game Code.

2.2.7 Natural Communities Conservation Planning Act

This act was enacted to encourage broad-based planning to provide for effective protection and conservation of the state's wildlife resources while continuing to allow appropriate development and growth (CFGC Sections 2800 to 2835). Natural Community Conservation Plans (NCCP) may be implemented, which identify measures necessary to conserve and manage natural biological diversity within the planning area, while allowing compatible and appropriate economic development, growth, and other human uses.

2.2.8 Senate Concurrent Resolution No. 17 – Oak Woodlands

State Senate Concurrent Resolution No. 17 is legislation that requests state agencies having land use planning duties and responsibilities to assess and determine the effects of their decisions or actions within any oak woodlands containing Blue, Engleman, Valley, or Coast Live Oak. The measure requests those state agencies to preserve and protect native oak woodlands to the maximum extent feasible or provide replacement plantings where designated oak species are removed from oak woodlands. The mitigation measures, as described above, will ensure that impacts to oak woodlands are less than significant.

3. SPECIAL STATUS SPECIES AND HABITATS

Prior to performing the field survey, available databases and documentation relevant to the Project Area were reviewed for documented occurrences of special status species in the Project vicinity (approximately 1 mile). The USFWS threatened and endangered species occurrence data overlay, USFWS Information for Planning and Consultation System (IPaC)and the most recent versions of the California Natural Diversity Database (CNDDB) and California Native Plant Society Electronic Inventory (CNPSEI) databases were searched for sensitive species data in the *Buttonwillow* USGS 7.5-Minute Series Quadrangle. These databases contain records of reported occurrences of State- and federally-listed species or otherwise special status species and habitats that may occur within the vicinity of the Project site (approximately 1 mile).

According to the database queries and literature review, 21 special status species and one sensitive habitat have been identified as potentially occurring in the Project vicinity. Of the 21 special status species identified, 13 are State and/or federally listed as threatened or endangered. Table 1 (attached) represents a compiled list of results from the IPaC, CNDDB and CNPS databases of listed species that have been documented in the *Buttonwillow* quad and/or could potentially occur within the Project vicinity. Table 1 also provides an assessment of each species' potential to occur on site, based on the field investigation of the Project area and surveyor's knowledge of the species and local ecology. Please refer to the attached IPaC List and CNDDB and CNPSEI Results for a complete list of all special status species and habitats identified in the database queries.

3.1 San Joaquin Kit Fox (Vulpes macrotis mutica)

The only listed species identified in the database queries and literature review that has a moderate or high potential to occur within the Project Area is the San Joaquin kit fox. This species is the larger of two subspecies of the kit fox, *Vulpes macrotis*, the smallest canid species in North America. The San Joaquin kit fox historically occurred in alkali scrub/shrub and arid grasslands throughout the level terrain of the San Joaquin Valley floor from southern Kern County, north to Tracy in San Joaquin County, and up into the more gradual slopes of the surrounding foothills and adjoining valleys of the interior Coast Range. Within this range, the kit fox has been associated with areas having open, level, sandy ground that is relatively stone-free to depths of about 3 to 4.5 feet. The San Joaquin kit fox utilizes subsurface dens, which may extend to 6 feet or more below ground surface, for shelter and for reproduction. Kit fox subspecies are absent or scarce in areas where soils are shallow due to high water tables, impenetrable hardpans, or proximity to parent material, such as bedrock. The kit fox also does not den in saturated soils or in areas subjected to periodic flooding

The San Joaquin kit fox is primarily nocturnal. The kit fox diet varies geographically, seasonally, and annually and includes nocturnal rodents such as kangaroo rats, white-footed mice and pocket mice (*Peromyscus* spp.), California ground squirrels (*Spermophilus beecheyi*), rabbits (*Sylvilagus* spp.) and hares (*Lepus* spp.), San Joaquin antelope squirrels (*Ammospermophilus nelsoni*), and ground-nesting birds.

3.1.1 Critical Habitat

The Project Area is not located within or adjacent any USFWS designated Critical Habitat units.

4. RESULTS

Jacobs biologist, Lisa Patterson, conducted a biological resources and jurisdictional waters assessment of the Project Area on April, 5 and May 19, 2022. The survey area encompassed the entire proposed Project footprint including the proposed WWTP facility improvements, proposed solar field and water and sewer connection pipeline alignment. The pedestrian survey included 100 percent coverage of the proposed solar field site and water and sewer connection pipeline alignment, as well as an approximately 200-foot buffer area on either side of the pipeline alignment and around the solar field site, where feasible and appropriate. The proposed WWTP facility improvements are within the existing fenced WWTP. Although 100 percent survey coverage within the existing WWTP facility was not achieved, the conditions on site have not changed since the 2019 surveys conducted by Jericho Systems.

Wildlife species were detected during field surveys by sight, calls, tracks, scat, or other signs. In addition to species observed, expected wildlife usage of the site was determined per known habitat preferences of regional wildlife species and knowledge of their relative distributions in the area. The Project Area was assessed for habitat type, structure, species composition/association, condition and human disturbances. The focus of the faunal species survey was to identify potential habitat for special status wildlife within the Project Area.

The Project site is completely disturbed, consisting of unvegetated fallow agricultural land, existing unpaved access road and existing WWTP facilities. No listed species, or other special status species, were observed during survey and no suitable habitat for any of the State- or federally-listed species identified in the database queries and literature review exists within the proposed Project Impact Area. The surrounding area is also disturbed, consisting primarily of agricultural development, utility infrastructure and residential development. Immediately adjacent the south side of the proposed 2-acre solar field site and the west side of the proposed water and sewer connection pipeline alignment is an approximately 7-acre disturbed parcel that is marginally-suitable to support several special status species including San Joaquin kit fox.

The proposed water and sewer connection pipeline alignment crosses an existing irrigation ditch (East Side Canal) near the southernmost end of the alignment. This man-made irrigation ditch is owned and operated by the Buena Vista Water Storage District.

5. EFFECTS ANALYSIS

The Project will not result in any direct impacts to State- and/or federally-listed species or other special status species, including any California Fully Protected species or California rare and endangered plant species. The Project will not result in the loss or adverse modification of USFWS designated Critical Habitat.

In accordance with the vacation of the Navigable Waters Protection Rule (2020), the Clean Water Act definition of waters has reverted back to the 1986 rule. In addition to this 1986 definition of Water of the U.S., the Supreme Court rulings of SWANCC and Rapano further clarify the limits of federal jusrisdiciton. The existing Buena Vista Water Storage District canal would not be subject to regulation by the USACE under Section 404 of the CWA. The Buena Vista Water Storage District canal is an intermittent, man-made irrigation ditch that is not a relocated tributary to a Water of the U.S. (WoUS) or excavated in a tributary and does not drain any wetlands. Therefore, the Project would be exempt from CWA Section 404 and 401 permitting. Additionally, this man-made irrigation ditch does not meet the CDFW definition of a lake, river or stream and does not support any aquatic resources, stream-dependent wildlife resources or riparian habitat. Therefore, the Project would be not require CDFW (FGC) Section 1602 permitting as well. However, the Project may still be subject to regulation by the RWQCB under the Porter-Cologne Water Quality Control Act and required to obtain State Waste Discharge Requirements (WDR).

There is some marginally-suitable habitat for San Joaquin kit fox adjacent the Project site. Additionally, the 2019 BRA prepared by Jericho Systems identified potentially suitable giant kangaroo rat and Tipton kangaroo rat habitat adjacent the Project site and documented unidentified *Dipodomys* footprints and tail drag marks adjacent the west side of the existing access road. Therefore, the Project may affect, but is not likely to adversely affect San Joaquin kit fox giant kangaroo rat and Tipton kangaroo rat.

There is habitat within the Project Area that is suitable to support nesting birds, including open ground-nesting species such as killdeer (*Charadrius vociferus*). Most native bird species are protected from unlawful take by the MBTA and Sections 3503, 3503.5, 3511, 3513 and 3800 of the CFGC. In general, impacts to all bird species (common and special status) can be avoided by conducting work outside of the nesting season, which is generally February 1st through August 31st. However, if all work cannot be conducted outside of nesting season, a Project-specific Nesting Bird Management Plan can be prepared to determine suitable avoidance buffers.

5.1 EFFECTS ANALYSIS - Other Regulations that may be affected by the proposed project:

Clean Water Act/ Protection of Wetlands—Executive Order 11990 (1977)/ Sections 1600 through 1606 of the California Fish and Game Code (CFGC)

There are no Waters of the US or Federally regulated Wetlands within the project APE.

Rivers and Harbors Act 1899

There are no navigable waters of the U.S within the Project APE.

Wild and Scenic Rivers Act.

As of 2019, there were 22 water body sections have a wild and scenic river designation in California. There are no riverine resources within the Project APE

Federal Endangered Species Act (ESA)

Marginally suitable habitat for San Joaquin kit fox, giant kangaroo rat and Tipton kangaroo rat occurs adjacent to treatment plant site and dirt access road, there is a potential for indirect impacts in the form of harassment to federally protected species.

California Endangered Species Act (CESA)

Although suitable habitat for San Joaquin kit fox and Tipton kangaroo rat occurs adjacent to treatment plant site and dirt access road, there is low potential for impacts to these species in the form of take as defined in the CESA. This project will not result in the direct taking of a State-listed species.

Coastal Barriers Resources Act Resources

Currently, the coastal barrier resource systems are located along the Atlantic and Gulf Coasts of the United States and the shore areas of the Great Lakes. Therefore, the Project is not located in a Coastal Barriers Resources Act area.

Coastal Zone Management Act Resources

The Project is not located in a Coastal Zone that where the provisions of this Act would be applicable.

Magnuson-Stevens Fishery Conservation and Management Act

The Project is not located 200 nautical miles from shore, nor does it impact any essential fish habitat that would impact regulated areas 200 nautical miles from shore.

Protection of Wetlands – Executive Order 11990

No drainages or indications of wetlands, hydric soils, naturally occurring indicator plant species were observed during the field survey nor are any expected to occur. There are no jurisdictional wetlands within or immediately adjacent to any of the Project components identified in the Project description. No impact to wetland areas will result from implementation of the proposed Project.

Migratory Bird Treaty Act (MBTA)/ CA Migratory Bird Act -Assembly Bill 454/ Migratory Bird—EO 13186 (2001)/ Migratory Bird Treaty Reform Act/ Bird Nesting Protections

Vegetation suitable for nesting birds does exist within the treatment plant basins and adjacent to the Project area. As discussed, most birds are protected by the MBTA. In general, impacts to all bird species (common and special status) can be avoided by conducting work outside of the nesting season, which is generally January/February to August/September, and by conducting a worker environmental awareness training. However, if all work cannot be conducted outside of nesting season, a Project-specific Nesting Bird Management Plan can be prepared to determine suitable buffers.

Preconstruction Nesting Bird Surveys are recommended prior to the commencement of any Project activities that may occur within the nesting season (February to September), to avoid any potential Project-related impacts to nesting birds within the Project area.

Wild and Scenic Rivers Act.

The Project is not located within a water body that is designated by the Wild and Scenic Rivers Act.

Habitat Conservation Plans

There are no Habitat Conservation Plans overlaid within the Project APE

Fish and Wildlife Coordination Act

If a federal agency is required to provide approval or funding, that agency will consult with the US. Fish and Wildlife Service and determine if the action “may effect” a listed species.

Magnuson-Stevens Fishery Conservation and Management Act

No essential fish habitat, defined as those waters and substrates needed by fish for spawning, breeding, feeding, and growth to maturity, occurs within the Project APE.

Bald and Golden Eagle Protection Act

There is no suitable Eagle habitat within the Project APE

Invasive Species—Executive Order 13112 (1999)

There are no native habitats within the Project APE that could be impacted by invasive species. No Invasive Species Plan is warranted.

Fully Protected Species

No fully protected species have been identified within the Project APE

Native Plant Protection Act/ Natural Communities Conservation Planning Act

There are no native plants or plant communities within the Project APE.

Senate Concurrent Resolution No. 17 – Oak Woodlands

There are no Oak (Quercus sp.) within the Project APE.

6. CONCLUSIONS AND RECOMMENDATIONS

The Project may affect but is not likely to adversely affect San Joaquin kit fox giant kangaroo rat and Tipton kangaroo rat. To avoid any potential Project-related effects on these listed species, the following avoidance measures are recommended:

- Install exclusionary fence around the entire proposed Project disturbance area, including the water and sewer connection pipeline alignment and solar field site, prior to initiating any ground disturbing activities.
  1.
- Have a qualified biological monitor on site during exclusionary fence installation and during initial ground disturbing activities.
  2.
- Conduct a pre-construction kit fox burrow survey within the proposed Project disturbance area prior to initiating any ground disturbing activities.
  3.
- Provide worker environmental awareness training to all on-site Project personnel.

Additionally, to avoid impacts to nesting birds (common and special status) during the nesting season, a qualified Avian Biologist should conduct pre-construction Nesting Bird Surveys (NBS) prior to Project-related disturbance to suitable nesting areas to identify any active nests. If no active nests are found, no further action would be required. If an active nest is found, the biologist should set appropriate no-work buffers around the nest which would be based upon the nesting species, its sensitivity to disturbance, nesting stage and expected types, intensity and duration of disturbance. The nest(s) and buffer zones should be field checked weekly by a qualified biological monitor. The approved no-work buffer zone should be clearly marked in the field, within which no disturbance activity should commence until the qualified biologist has determined the young birds have successfully fledged and the nest is inactive.

The Project Area is within the Central Valley RWQCB (Regional Board 5F) jurisdictional boundary and may require WDR. Furthermore, since the project will encompass more than one acre of disturbance, a National Pollutant Discharge Elimination System (NPDES) permit would likely be required. Therefore, it is recommended that the Project Proponent contact the Central Valley RWQCB (Fresno Office) to inquire as to whether WDR are required for the temporary construction impacts to the existing Buena Vista Water Storage District canal associated with the installation of the water and sewer connection pipelines, as well as to obtain an NPDES permit. Additionally, impacts to the canal may require an encroachment permit from the Buena Vista Water Storage District. Therefore, it is also recommended that the Project Proponent coordinate with the Buena Vista Water Storage District prior to commencement of any construction activities that would impact the East Side Canal.

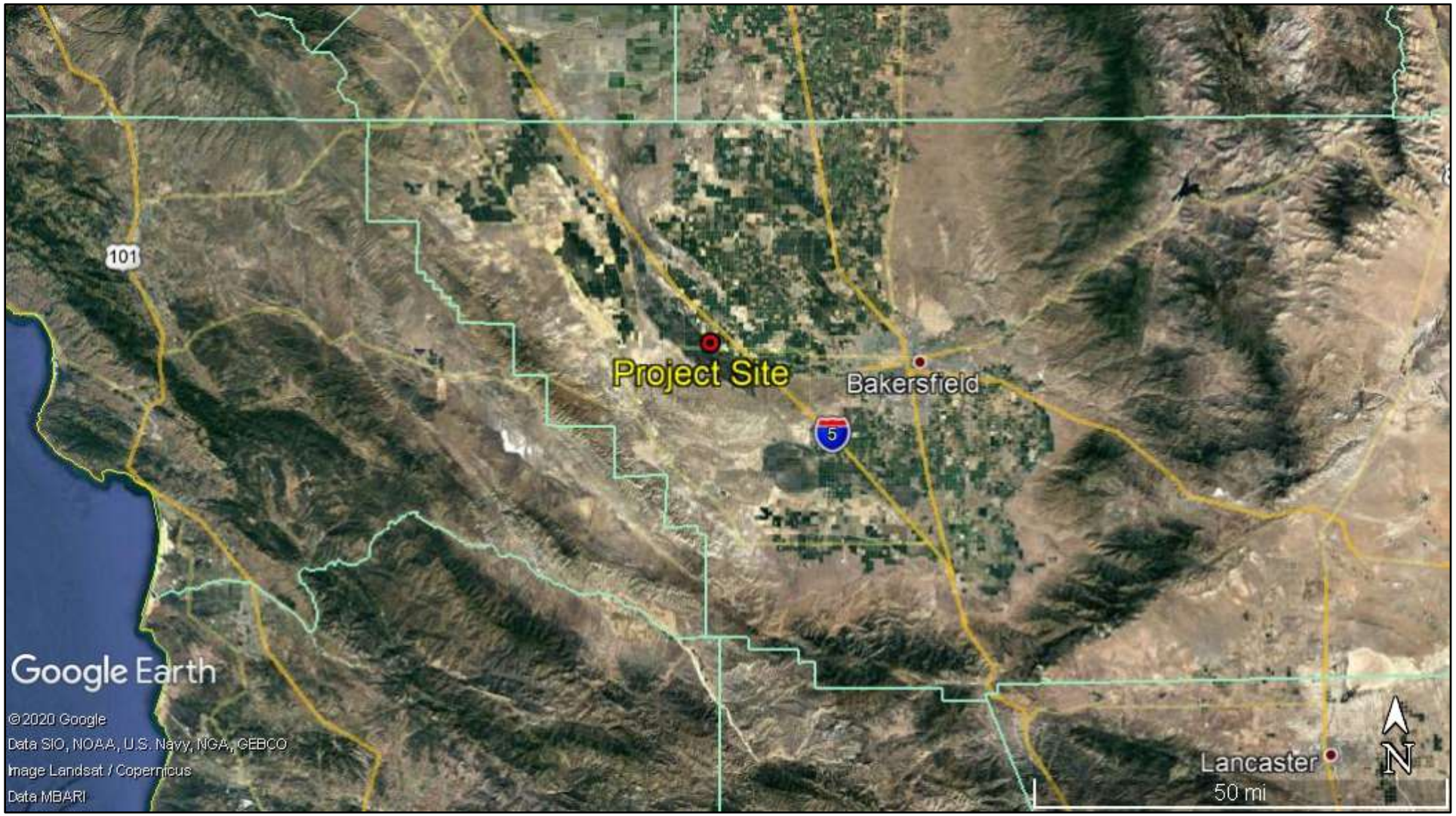
Additional Figures –

Figure 2 – Regional Vicinity Map
Figure 3 – Topographic Map of Site Location
Figure 4 – Aerial Photograph of Site Location

Table 1: Listed Species Occurrence Potential

Site Photos

IPaC List and CNDDB and CNPSEI Results



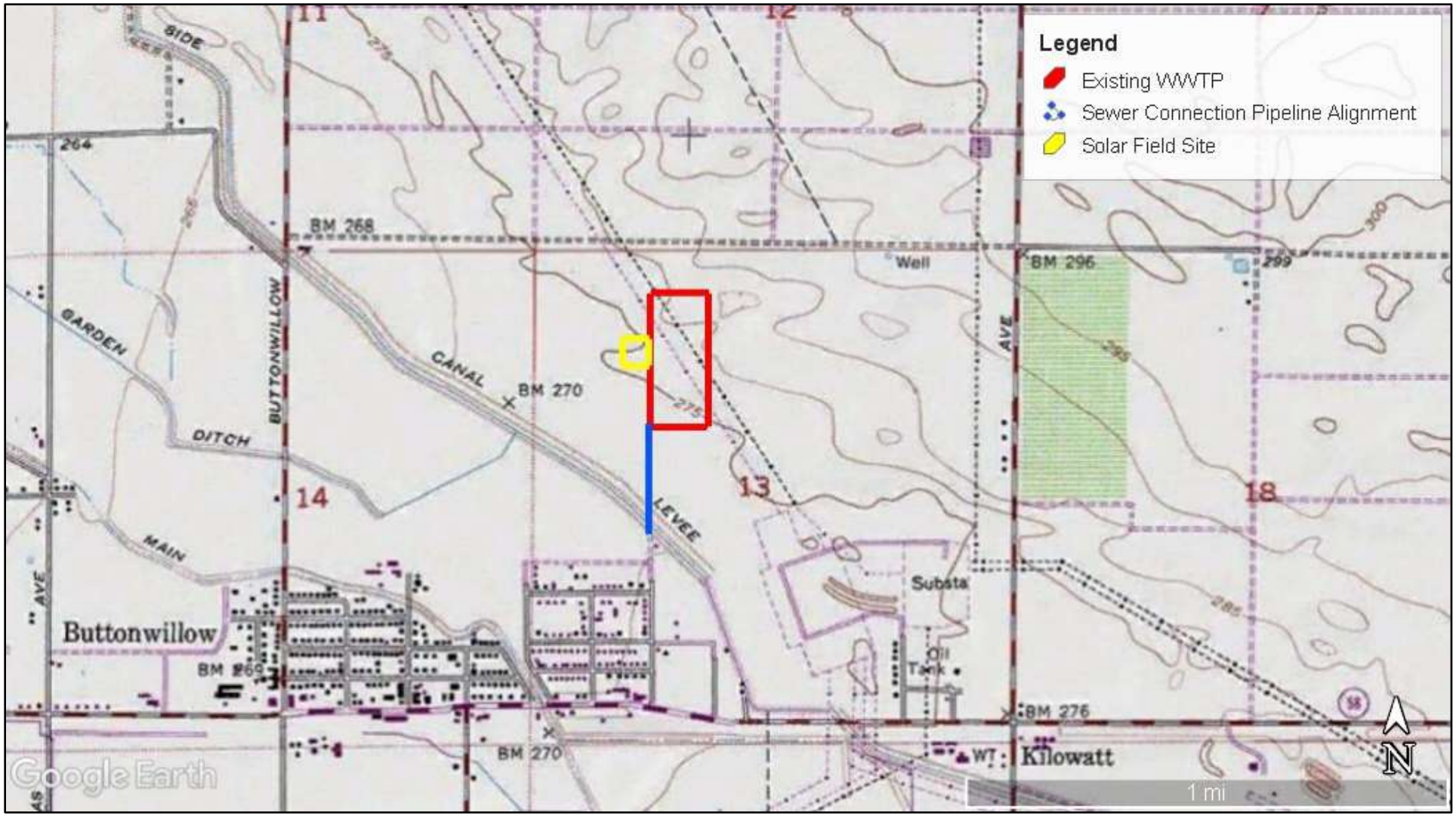
SOURCE: Google Earth

FIGURE 1

JACOBS

Regional Vicinity Map

BCWD WWTP Improvements Project

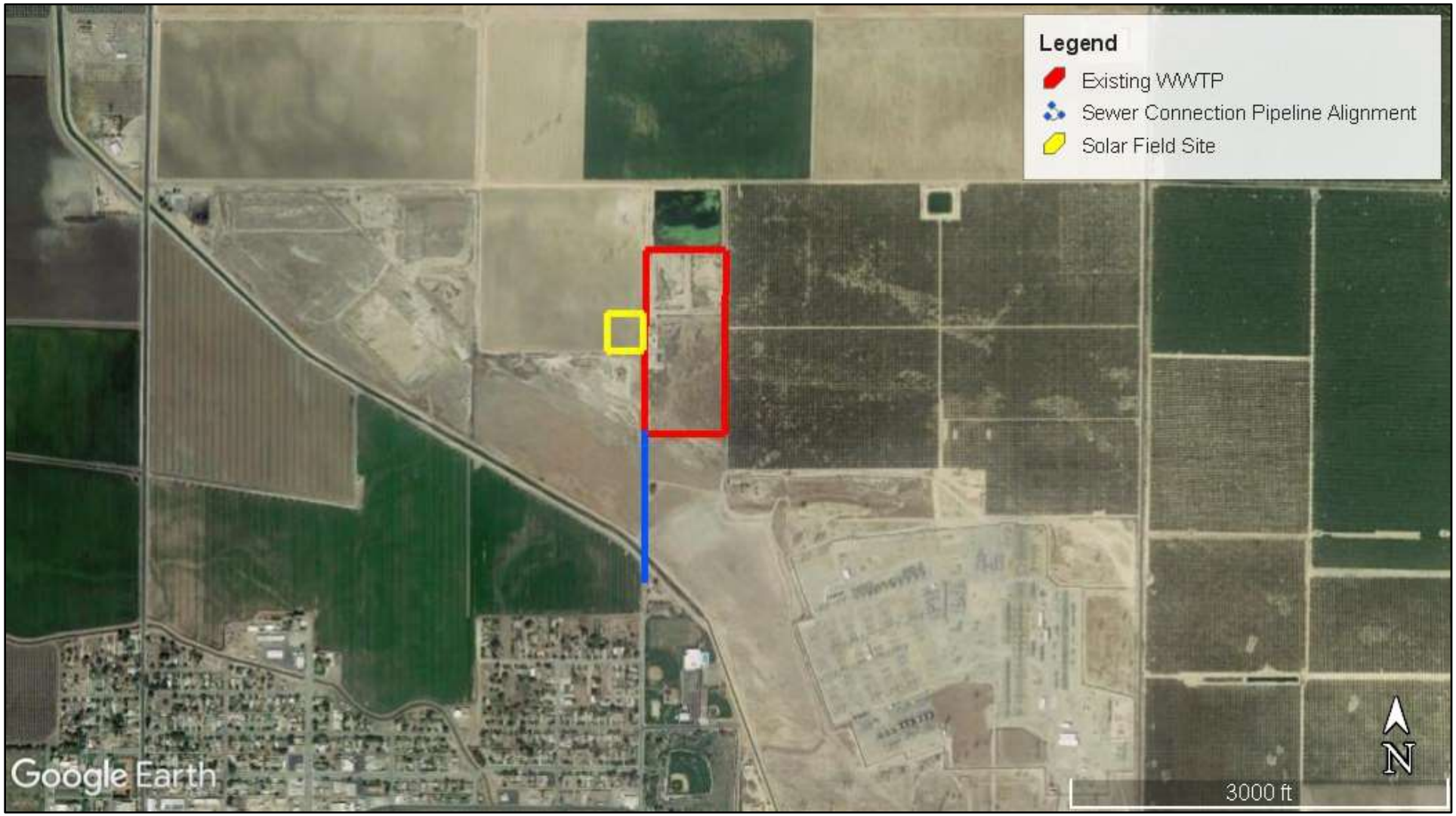


SOURCE: Google Earth

FIGURE 2

Topographic Map of Site Location

BCWD WWTP Improvements Project



SOURCE: Google Earth

FIGURE 3

JACOBS

Aerial Photograph of Site Location

BCWD WWTP Improvements Project

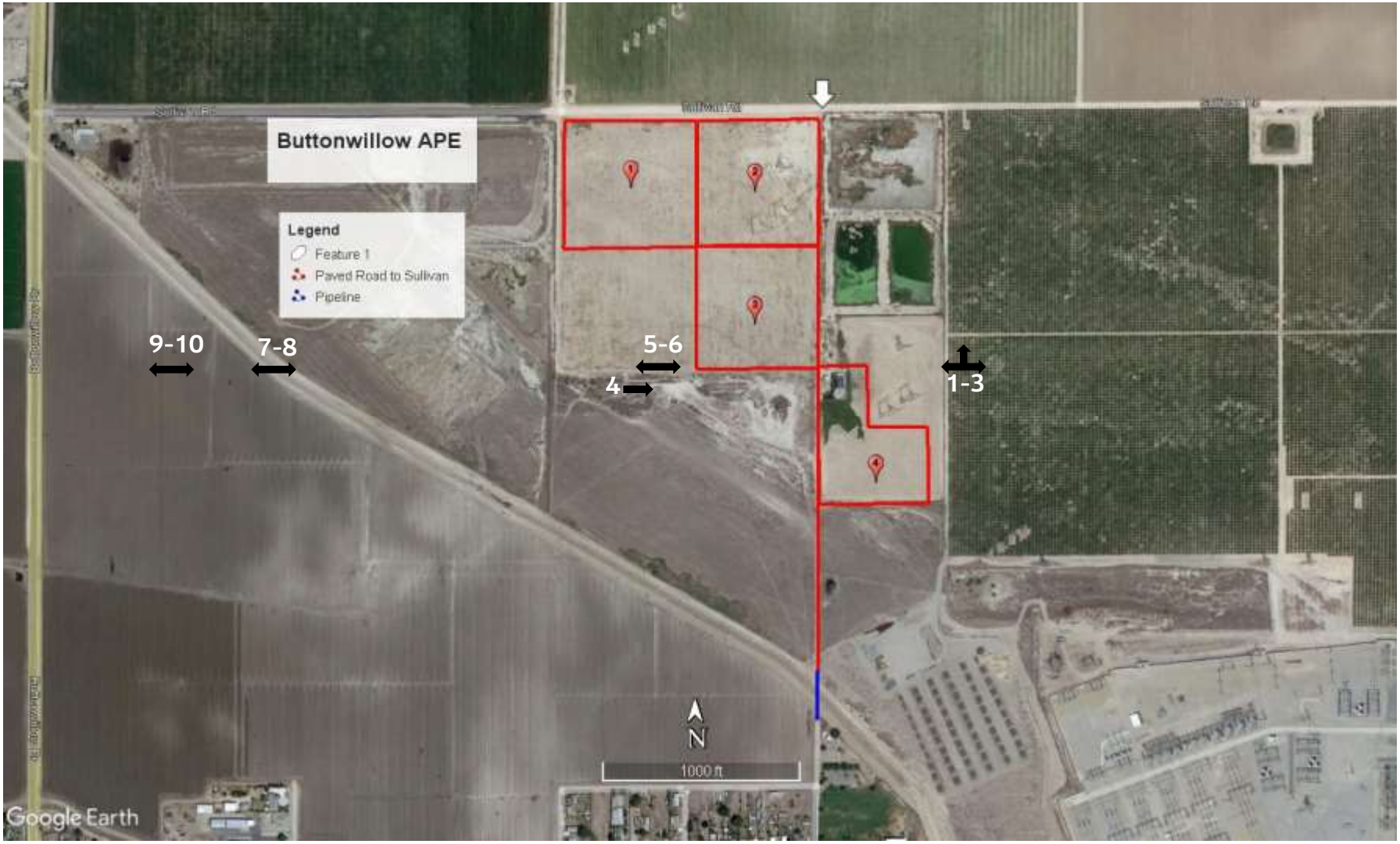
Table 1: State and Federally Listed Species Occurrence Potential within the Project Area

Scientific Name	Common Name	Federal/ State Listing Status	Habitat	Occurrence Potential
Ammospermophilus nelsoni	Nelson's antelope squirrel	None/ Threatened	Chenopod scrub habitat within Western San Joaquin Valley from 200-1,200-foot elevation. On dry, sparsely vegetated loam soils. Dig burrows or use k-rat burrows. Need widely scattered shrubs, forbs and grasses in broken terrain with gullies and washes.	No suitable habitat for this species exists within the Project site, but some marginally-suitable habitat exists to the W/SW of the site. However, the only documented occurrence for this species in the Project vicinity is a museum collection from 1915. The nearest recently documented occurrence (2003) for this species is approx. 4.3 miles NE of the Project Area in suitable chenopod scrub habitat. Occurrence potential is **low**.
Branchinecta lynchi	vernal pool fairy shrimp	Threatened/ None	Endemic to the grasslands of the Central Valley, Central Coast mountains, and South Coast mountains, in astatic rain-filled pools. Inhabit small, clear-water sandstone-depression pools and grassed swale, earth slump, or basalt-flow depression pools.	No suitable vernal pool habitat for this species exists within the Project Area. This species is presumed **absent** from the Project Area.
Buteo swainsoni	Swainson's hawk	None/ Threatened	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands with groves or lines of trees. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	Although there is some suitable foraging habitat for this species within the Project Area, there is no suitable nesting habitat within the Project Area. Occurrence potential is **low**.

Scientific Name	Common Name	Federal/ State Listing Status	Habitat	Occurrence Potential
Dipodomys ingens	giant kangaroo rat	Endangered/ Endangered	Annual grasslands on the western side of the San Joaquin Valley, marginal habitat in alkali scrub. Need level terrain and sandy loam soils for burrowing.	No suitable habitat for this species exists within the Project site, but some marginally-suitable habitat exists to the W/SW of the site. However, the nearest documented occurrence (1979) for this species is approx. 3.7 miles SW of the Project Area and separated from the Project Area by existing agricultural development and the California Aqueduct and Kern River Flood Canal. Furthermore, there are no documented occurrences for this species N of the Kern River Flood Canal. Occurrence potential is **low**.
Dipodomys nitratoides nitratoides	Tipton kangaroo rat	Endangered/ Endangered	Saltbrush scrub and sink scrub communities in the Tulare Lake Basin of the southern San Joaquin Valley. Needs soft friable soils which escape seasonal flooding. Digs burrows in elevated soil mounds at bases of shrubs.	No suitable habitat for this species exists within the Project site, but some marginally-suitable habitat exists to the W/SW of the site. However, the nearest documented occurrence (1992) for this species is approx. 2 miles NE of the Project Area in suitable chenopod scrub habitat. Occurrence potential is **low**.
Eremalche parryi ssp. *kernensis*	Kern mallow	Endangered/ None	Chenopod scrub, valley and foothill grassland, pinyon and juniper woodlands. On dry, open, sandy to clay soils; usually within valley saltbush scrub; often at edge of balds. 60-1295 m.	The Project site is completely disturbed and has been subject to previous clearing, grading and other agricultural practices. Furthermore, this species was not observed during surveys conducted in 2019 or 2020. Occurrence potential is **low**.
Gambelia sila	blunt-nosed leopard lizard	Endangered/ Endangered	Resident of sparsely vegetated alkali and desert scrub habitats, in areas of low topographic relief. Seeks cover in mammal burrows, under shrubs or structures such as fence posts; they do not excavate their own burrows.	No suitable habitat for this species exists within the Project site, but some marginally-suitable habitat exists to the W/SW of the site. However, the nearest documented occurrence (1992) for this species is approx. 2 miles E of the Project Area. Occurrence potential is **low**.

Scientific Name	Common Name	Federal/ State Listing Status	Habitat	Occurrence Potential
Hypomesus transpacificus	Delta smelt	Threatened/ Endangered	Sacramento-San Joaquin Delta. Seasonally in Suisun Bay, Carquinez Strait and San Pablo Bay. Seldom found at salinities > 10 ppt. Most often at salinities < 2ppt.	No suitable aquatic habitat for this species exists within the Project Area. This species is presumed **absent** from the Project Area.
Monolopia congdonii	San Joaquin woollythreads	Endangered/ None	Chenopod scrub, valley and foothill grassland. Alkaline or loamy plains; sandy soils, often with grasses and within chenopod scrub. 55-840 m.	The Project site is completely disturbed and has been subject to previous clearing, grading and other agricultural practices. Furthermore, this species was not observed during surveys conducted in 2019 or 2020. Occurrence potential is **low**.
Rana draytonii	California red-legged frog	Threatened/ None	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development. Must have access to estivation habitat.	No suitable aquatic habitat for this species exists within the Project Area. This species is presumed **absent** from the Project Area.
Sorex ornatus relictus	Buena Vista Lake ornate shrew	Endangered/ None	Marshlands and riparian areas in the Tulare Basin. Prefers moist soil. Uses stumps, logs and litter for cover.	No suitable wetland/riparian habitat for this species exists within the Project Area and the only documented occurrence for this species in the Project vicinity is a museum collection from 1909, described as being from the general Buttonwillow area. This species is presumed **absent** from the Project Area.
Thamnophis gigas	giant gartersnake	Threatened/ Threatened	Prefers freshwater marsh and low gradient streams. Has adapted to drainage canals and irrigation ditches. This is the most aquatic of the garter snakes in California.	No suitable aquatic habitat for this species exists within the Project Area. This species is presumed **absent** from the Project Area.

Scientific Name	Common Name	Federal/ State Listing Status	Habitat	Occurrence Potential
Vulpes macrotis mutica	San Joaquin kit fox	Endangered/ Threatened	Annual grasslands or grassy open stages with scattered shrubby vegetation. Need loose-textured sandy soils for burrowing, and suitable prey base.	There are several documented occurrences for this species within the Project vicinity (1992 and 1975) and there is some marginally-suitable habitat for this species adjacent the Project site. Occurrence potential is **moderate**.


Buttonwillow APE
Legend
Feature 1
Paved Road to Sullivan
Pipeline
9-10
7-8
5-6
4
1-3
N
1000 ft
Google Earth

Site Photos

Photo 1. Looking East along access road between existing WWTP (right) and proposed Solar Field Site (left).

Photo 2. Looking W at proposed Solar Field Site from SE corner of the site.

Photo 3. Looking S along access road between existing WWTP (left) and adjacent parcel S of the proposed Solar Field Site, toward N end of the proposed Water and Sewer Connection Pipeline alignment.

Photo 4. Looking N at proposed WWTP.

Photo 5. Looking N along access road between existing WWTP (right) and adjacent parcel S of the proposed Solar Field Site from N end of the proposed Water and Sewer Connection Pipeline alignment.

Photo 6. Looking S along existing access road from N end of the proposed Water and Sewer Connection Pipeline alignment.

Photo 7. Looking N along proposed Water and Sewer Connection Pipeline alignment from N side of Buena Vista Water Storage District canal.

Photo 8. Looking S along proposed Water and Sewer Connection Pipeline alignment from N side of Buena Vista Water Storage District canal.

Photo 9. Looking N along proposed Water and Sewer Connection Pipeline alignment from S side of Buena Vista Water Storage District canal.

Photo 10. Looking S along proposed Water and Sewer Connection Pipeline alignment from S side of Buena Vista Water Storage District canal.

IPaC List and CNDDB and CNPSEI Results

IPaC **U.S. Fish & Wildlife Service**

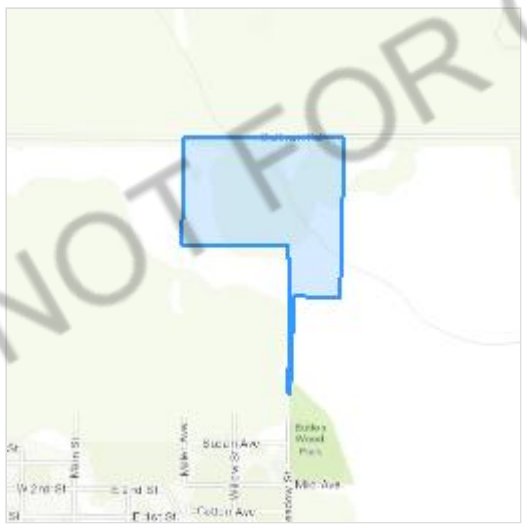
IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Kern County, California



Local office

Sacramento Fish And Wildlife Office

(916) 414-6600
(916) 414-6713

Federal Building

2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Buena Vista Lake Ornate Shrew Sorex ornatus relictus Wherever found There is **final** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/1610	Endangered
Giant Kangaroo Rat Dipodomys ingens Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6051	Endangered
San Joaquin Kit Fox Vulpes macrotis mutica Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2873	Endangered
Tipton Kangaroo Rat Dipodomys nitratoides nitratoides Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/7247	Endangered

Reptiles

NAME	STATUS
Blunt-nosed Leopard Lizard Gambelia silus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/625	Endangered
Giant Garter Snake Thamnophis gigas Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4482	Threatened

Fishes

NAME	STATUS
Delta Smelt Hypomesus transpacificus Wherever found There is **final** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/321	Threatened

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Crustaceans

NAME	STATUS
Vernal Pool Fairy Shrimp Branchinecta lynchi Wherever found There is **final** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/498	Threatened

Flowering Plants

NAME	STATUS
San Joaquin Wooly-threads Monolopia (=Lembertia) congdonii Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/3746	Endangered

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY

	BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
California Thrasher Toxostoma redivivum This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Jan 1 to Jul 31
Lawrence's Goldfinch Carduelis lawrencei This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9464	Breeds Mar 20 to Sep 20
Tricolored Blackbird Agelaius tricolor This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3910	Breeds Mar 15 to Aug 10

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

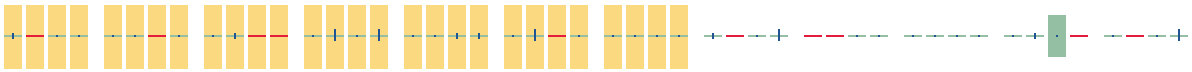
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

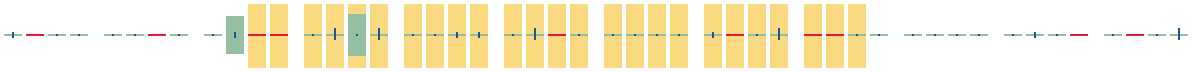
No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

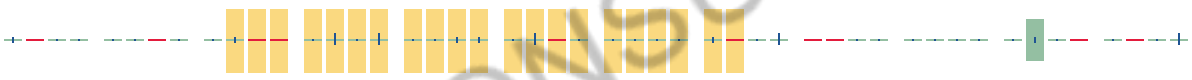
California Thrasher BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Lawrence's Goldfinch BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Tricolored Blackbird BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Coastal Barrier Resources System

Projects within the John H. Chafee Coastal Barrier Resources System (CBRS) may be subject to the restrictions on federal expenditures and financial assistance and the consultation requirements of the Coastal Barrier Resources Act (CBRA) (16 U.S.C. 3501 et seq.). For more information, please contact the local Ecological Services Field Office or visit the CBRA

Consultations website. The CBRA website provides tools such as a flow chart to help determine whether consultation is required and a template to facilitate the consultation process.

THERE ARE NO KNOWN COASTAL BARRIERS AT THIS LOCATION.

Data limitations

The CBRS boundaries used in IPaC are representations of the controlling boundaries, which are depicted on the official CBRS maps. The boundaries depicted in this layer are not to be considered authoritative for in/out determinations close to a CBRS boundary (i.e., within the "CBRS Buffer Zone" that appears as a hatched area on either side of the boundary). For projects that are very close to a CBRS boundary but do not clearly intersect a unit, you may contact the Service for an official determination by following the instructions here: https://www.fws.gov/service/coastal-barrier-resources-system-property-documentation

Data exclusions

CBRS units extend seaward out to either the 20- or 30-foot bathymetric contour (depending on the location of the unit). The true seaward extent of the units is not shown in the CBRS data, therefore projects in the offshore areas of units (e.g., dredging, breakwaters, offshore wind energy or oil and gas projects) may be subject to CBRA even if they do not intersect the CBRS data. For additional information, please contact CBRA@fws.gov.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER POND

Palustrine

RIVERINE

Riverine

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Buttonwillow (3511944))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Ammospermophilus nelsoni Nelson's (=San Joaquin) antelope squirrel	AMAFB04040	None	Threatened	G2G3	S2S3	
Arizona elegans occidentalis California glossy snake	ARADB01017	None	None	G5T2	S2	SSC
Astragalus hornii var. hornii Horn's milk-vetch	PDFAB0F421	None	None	GUT1	S1	1B.1
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S3	SSC
Atriplex cordulata var. erecticaulis Earlimart orache	PDCHE042V0	None	None	G3T1	S1	1B.2
Atriplex minuscula lesser saltscale	PDCHE042M0	None	None	G2	S2	1B.1
Atriplex subtilis subtle orache	PDCHE042T0	None	None	G1	S1	1B.2
Buteo swainsoni Swainson's hawk	ABNKC19070	None	Threatened	G5	S3	
Dipodomys nitratoides nitratoides Tipton kangaroo rat	AMAFD03152	Endangered	Endangered	G3T1T2	S1S2	
Eremalche parryi ssp. kernensis Kern mallow	PDMAL0C031	Endangered	None	G3G4T3	S3	1B.2
Eriastrum hooveri Hoover's eriastrum	PDPLM03070	Delisted	None	G3	S3	4.2
Eumops perotis californicus western mastiff bat	AMACD02011	None	None	G4G5T4	S3S4	SSC
Gambelia sila blunt-nosed leopard lizard	ARACF07010	Endangered	Endangered	G1	S1	FP
Onychomys torridus tularensis Tulare grasshopper mouse	AMAFF06021	None	None	G5T1T2	S1S2	SSC
Perognathus inornatus San Joaquin pocket mouse	AMAFD01060	None	None	G2G3	S2S3	
Phrynosoma blainvillii coast horned lizard	ARACF12100	None	None	G3G4	S3S4	SSC
Sorex ornatus relictus Buena Vista Lake ornate shrew	AMABA01102	Endangered	None	G5T1	S1	SSC
Spea hammondii western spadefoot	AAABF02020	None	None	G2G3	S3	SSC
Taxidea taxus American badger	AMAJF04010	None	None	G5	S3	SSC
Thamnophis gigas giant gartersnake	ARADB36150	Threatened	Threatened	G2	S2	

Selected Elements by Scientific Name

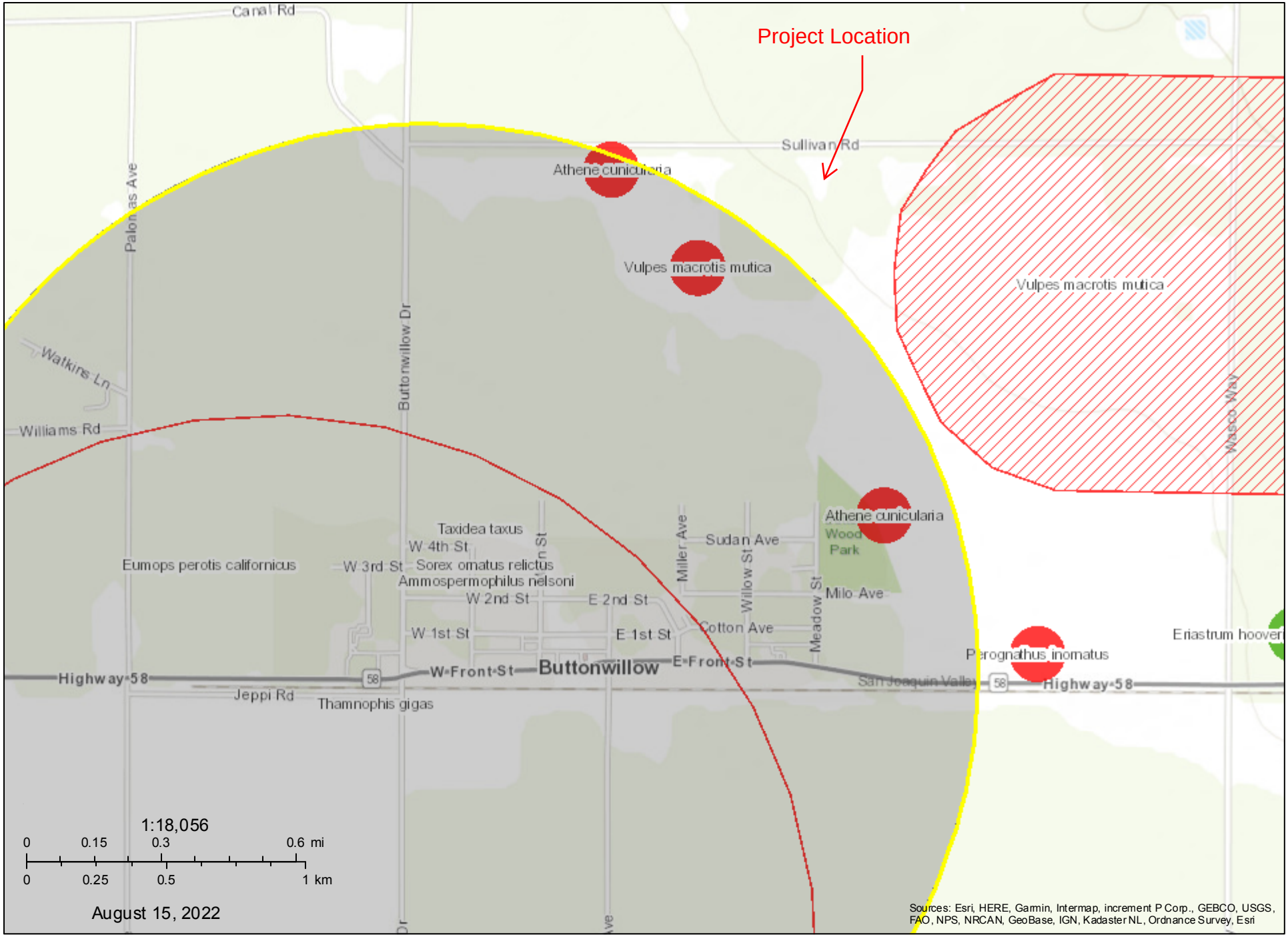
California Department of Fish and Wildlife

California Natural Diversity Database

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Valley Saltbush Scrub	CTT36220CA	None	None	G2	S2.1	
Valley Saltbush Scrub						
Vulpes macrotis mutica	AMAJA03041	Endangered	Threatened	G4T2	S2	
San Joaquin kit fox						

Record Count: 22

Map of Project Area



Author: Lisa.Patterson@jacobs.com

APPENDIX 3b

47 1st Street, Suite 1
Redlands, CA 92373-4601
(909) 915-5900

May 20, 2019

Tom Dodson
Tom Dodson & Associates
2150 North Arrowhead Avenue
San Bernardino, CA 92405

RE: Biological Resources Assessment
Buttonwillow County Water District Wastewater Treatment Plant Improvement Project
Unincorporated community of South Shafter, Kern County

Dear Tom:

Jericho Systems, Inc. (Jericho) is pleased to provide the results of the general biological resources assessment (BRA) and Jurisdictional Waters Delineation (JD) report for the Buttonwillow County Water District 's (BCWD's) Wastewater Treatment Plant Improvement Project (Project) located in the Buttonwillow area of western Kern County, CA.

This report is designed to address potential effects of the proposed Project to designated Critical Habitats and/or any species currently listed or formally proposed for listing as endangered or threatened under the federal Endangered Species Act (ESA) and the California Endangered Species Act (CESA), or species designated as sensitive by the California Department of Fish and Wildlife (CDFW), or the California Native Plant Society (CNPS). Attention was focused on sensitive biological resources known to occur locally (within a 3-mile radius of the Project area boundaries). This report also addresses resources protected under the Coastal Barriers Resources Act, Coastal Zone Management Act, Magnuson-Stevens Fishery Conservation and Management Act, the Protection of Wetlands – Executive Order 11990, Migratory Bird Treaty Act and Wild and Scenic Rivers Act.

The Project involves State Revolving Funds administered by the State Water Resources Control Board (SWRCB). The biological resources assessment was conducted in accordance with a process termed as CEQA-Plus (California Environmental Quality Act (CEQA)).

PROJECT LOCATION

The Project is located 25 miles west of the City of Bakersfield in the Buttonwillow area of Kern County, California. The waste water treatment plant (WWTP) is located approximately 0.5 miles north of the Buttonwillow community, south of Sullivan Road, west of Wasco Way, north of the Buena Vista Water Storage District canal and east of Buttonwillow Drive. The Project can be found on the Buttonwillow Quadrangle of the United States Geological Survey's (USGS) 7.5-minute topographic map series within Section 13, Township 29 South, Range 23 East, Mount Diablo Base and Meridian.

PROJECT DESCRIPTION

The BCWD proposes improvements to their existing WWTP in order to provide the necessary treatment upgrades to reliably meet Waste Discharge Requirements at a low operations and maintenance cost. The proposed Project consist of constructing a dual-power, multicellular aeration pond system that consists of a lined pond with disposal to the existing disposal ponds at the WWTP. The pond system would include construction of a multi-celled pond approximately 230 ft x 110 ft (1.3 MG) in size and recirculation pump. A new headworks would be constructed with an automatically cleaned screen. Other ancillary facilities would include electrical improvements, operations building and paved access road.

The access road to the WWTP off Sullivan Road is currently an unmaintained dirt road. During the wet season, the road is undrivable. At minimum, a single lane 16-ft wide paved access road would be constructed to the WWTP entrance to provide year-round vehicle access and proper road drainage. The total length of the road is approximately 1,800 feet.

A pre-engineered building equipped with a HVAC system with office space, laboratory counter space, sink for sampling activities, and a restroom will be provided. The building may also house the motor control center and electrical gear.

The WWTP does not currently have supply water for potable purposes. Installation of potable water service is proposed for the new WWTP to provide service water, drinking water and a restroom. Providing service from the BCWD's potable water system would require installation of about ½ mile of pipeline from the Buttonwillow community to the WWTP. The pipeline will cross an existing Buena Vista Water Storage District canal.

The Project components will occur on developed, disturbed land at the WWTP facility, land currently leased for agriculture, and within compacted dirt and paved roads that are adjacent agricultural and rural residential land.

SPECIAL STATUS SPECIES AND HABITAT

As stated above, the objective of this document is to determine whether the Project area supports special status or otherwise sensitive species and/ or their habitat, and to address the potential effects associated with the proposed project on those resources. The species and habitats addressed in this document are based on database information and field investigation.

Prior to conducting the field study, species and habitat information was gathered from the reports related to the specific project and relevant databases for the *Buttonwillow* USGS quadrangle to determine which species and/or habitats would be expected to occur on site. These sources include:

- U.S. Fish and Wildlife (USFWS) threatened and endangered species occurrence GIS overlay;
- USFWS Information for Planning and Consultation System (IPaC);
- California Natural Diversity Database (CNDDB) *Rarefind 5*);
- CNDDB Biogeographic Information and Observation System (BIOS);
- California Native Plant Society Electronic Inventory (CNPSEI) database;
- Calflora Database;
- USDA Natural Resources Conservation Service (NRCS) Web Soil Survey;
- USFWS National Wetland Inventory; and
- Environmental Protection Agency (EPA) Water Program "My Waters" data layers.

According to the database queries, 19 sensitive species been documented to occur in the *Buttonwillow* USGS 7.5-minute series quadrangle. Of the 19 sensitive species identified, 11 are State and/or federally listed as threatened or endangered. Table 1 below represents a compiled list of results from IPaC, CNDDB and CNPS databases of listed species which have been documented within this quad and provides a potential to occur assessment based on the field investigation of the Project area and surveyor's knowledge of the species and local ecology (See attached database results)

Table 1:
State and Federally Listed Species Occurrence Potential within the Project Area

Scientific Name	Common Name	Federal / State Status	Habitat	Potential to Occur
Mammals				
Sorex ornatus relictus	Buena Vista Lake Ornate Shrew	Endangered/ None	Habitat essential for the shrew contains riparian and wetland vegetation communities with an abundance of leaf litter and dense herbaceous cover. They are most commonly found in close proximity to a reliable body of water. Moist soil in areas with an overstory of willows or cottonwoods appears to be favored, but may not be an essential habitat feature	The treatment plant basins have moist conditions with emergent vegetation; however, the basin does not have an overstory associated with it. Therefore, no suitable habitat exists on site for the shrew. The potential for this species to occur is **low.**
Dipodomys ingens	Giant Kangaroo Rat	Endangered/ None	This species inhabits annual grassland communities with few or no shrubs, well drained, sandy-loam soils located on gentle slopes (less than 11 percent) in areas with about 6.3 inches or less of annual precipitation. Associated with San Joaquin kit fox, blunt-nosed leopard lizards, San Joaquin antelope squirrel and California jewelflower.	Suitable habitat for this species does not exist within the Project site but does adjacent to the southwest of the site. The potential for this species to occur in the immediate vicinity is **moderate.**
Dipodomys nitratoides nitratoides	Tipton Kangaroo Rat	Endangered/ Endangered	Open areas with flat terrain not subject to flooding is essential for permanent occupancy by Tipton kangaroo rats.	Suitable habitat for this species does not exist within the Project site but does in the broader vicinity of the site. The potential for this species to occur in the immediate vicinity of the Project site is **low to moderate.**
Vulpes macrotis mutica	San Joaquin Kit Fox	Endangered/ Threatened	Kit fox are an arid-land-adapted species and typically occur in desert-like habitats characterized by sparse or absent shrub cover, sparse ground cover, and short vegetative structure in alkali scrub/shrub and arid grasslands. The kit fox is associated with areas having open, level, sandy ground hat is relatively stone-free.	Typical habitat associated with this species is not present on the Project site, but does exist in adjacent areas, specifically to the southwest. This species was not observed during survey. The potential for this species to occur is **moderate**.

Scientific Name	Common Name	Federal / State Status	Habitat	Potential to Occur
Reptiles				
Gambelia silus	Blunt-nosed Leopard Lizard	Endangered/ Endangered	Typically inhabits open, sparsely vegetated areas of low relief on the San Joaquin Valley floor and in the surrounding foothills. They are most commonly found in as Nonnative Grassland and Valley Sink Scrub communities, but are also found in Valley Needlegrass Grassland, Alkali Playa, and Atriplex Grassland	Suitable habitat for this species does not exist within the Project. Species was not observed during survey. The potential for this species to occur is **low**.
Thamnophis gigas	Giant Garter Snake	Threatened/ None	Occurs in marshes, sloughs, ponds, small lakes, low gradient streams and other waterways and agricultural wetlands. Habitat for the giant garter snake consists of (1) adequate water during the snake's active season, (2) emergent herbaceous wetland vegetation for escape and foraging habitat, (3) grassy banks and openings in waterside vegetation for basking, and (4) higher elevation upland habitat for cover and refuge from flooding.	The Project area is in a developed area with road ways, and residential and agricultural uses. Suitable habitat for this species does not exist within the Project area. The potential for this species to occur is **none**.
Amphibians				
Rana draytonii	California Red-legged Frog	Threatened/ None	Breeding sites of the California red-legged frog are in aquatic habitats including pools and backwaters within streams and creeks, ponds, marshes, springs, sag ponds, dune ponds and lagoons. Additionally, California red-legged frogs frequently breed in artificial impoundments such as stock ponds	The Project area is in a developed area with road ways, and residential and agricultural uses. Suitable habitat for this species does not exist within the Project area. The potential for this species to occur is **none**.
Fish				
Hypomesus transpacificus	Delta Smelt	Threatened/ None	This is an aquatic species.	The Project area is in a developed area with road ways, and residential and agricultural uses. Suitable habitat for this species does not exist within the Project area. The potential for this species to occur is **none**.
Crustaceans				
Branchinecta lynchii	Vernal Pool Fairy Shrimp	Threatened/ None	Endemic to the grasslands of the northern two-thirds of the Central Valley; found in large, turbid pools. Inhabit astatic pools located in swales formed by old, braided alluvium; filled by winter/spring rains, last until June.	Suitable habitat for this species does not exist within the Action Area. The potential for this species to occur is **none.**

Scientific Name	Common Name	Federal / State Status	Habitat	Potential to Occur
Plants				
Caulanthus californicus	California jewelflower	Endangered/ Endangered	Occurs Upper Sonoran Subshrub Scrub, and Cismontane Juniper Woodland and Scrub communities at an elevation range of 230 - 3,280 feet.	Suitable habitat for this species does not exist within the Action Area. Species was not observed during survey. The potential for this species to occur is **low**.
Eremalche parryi ssp. kernensis	Kern mallow	Endangered/ None	The species occurs on alkali flats and eroded hillsides of the southern San Joaquin Valley and adjacent areas of California. It is often found growing under and around *Atriplex spinifera* (spiny saltbush), and *A. polycarpa* (common saltbush) or *Ephedra californica* (desert tea);at higher elevations (up to 5000 feet) it grows at the base of *Juniperus californicus* (California juniper) in the juniper scrub community It typically grows in areas where shrub cover is less than 25 percent and average herbaceous cover ranges from 48 to 80 percent.	Suitable habitat for this species does not exist within the Action Area. Species was not observed during survey. The potential for this species to occur is **low**.

Buena Vista Lake Ornate Shrew (*Sorex ornatus relictus*)

The Buena Vista Lake ornate shrew (shrew) is one of nine subspecies of ornate shrews known to occur in California. It is a small dull black to grey-brown shrew with a relatively short bicolored tail darker near the tip. It is about the size of a mouse and has a long-pointed snout, five toes on each foot, tiny beadlike eyes, soft fur, visible external ears, and a scaly, well developed tail covered with very short hairs. They are active during the day and night but are rarely seen due to their small size and cryptic behavior. They have a high rate of metabolism due to their small size and they constantly search for food to maintain their body temperatures, especially in cold conditions. They eat insects.

Habitat essential for the shrew contains riparian and wetland vegetation communities with an abundance of leaf litter and dense herbaceous cover. The shrews are most commonly found in close proximity to a reliable body of water.

Giant Kangaroo Rat (*Dipodomys ingens*)

The giant kangaroo rat is a small burrowing rodent with large hind limbs, long tail and large fur-lined cheek pouches adapted for bipedal locomotion (two-footed hopping). Giant kangaroo rats are primarily seed eaters, but also eat green plants and insects and inhabit annual grassland communities with few or no shrubs, well drained, sandy-loam soils located on gentle slopes (less than 11 percent) in areas with about 6.3 inches or less of annual precipitation. The kangaroo rats form colonies of burrows called precincts in which multiple individuals reside. They are primarily nocturnal and are active all year in all types of weather. When abundant locally, giant kangaroo rats are significant prey items for many species, including the Federal and State listed endangered San Joaquin kit fox (*Vulpes macrotis mutica*).

Giant kangaroo rat habitat is currently fragmented into six major geographic units: (1) the Ciervo-Panoche Region in western Fresno and eastern San Benito Counties; (2) Kettleman Hills in southwestern Kings County; (3) San Juan Creek Valley in eastern San Luis Obispo County; (4) the Lokern area, Elk Hills (NPR1), that includes Buena Vista and McKittrick Valleys, NPR-2, Taft, and Maricopa in western Kern County; (5) the Carrizo Plains in eastern San Luis Obispo County; and (6) the Cuyama Valley along the eastern Santa Barbara-San Luis Obispo County line (USFWS 1998).

Currently, the giant kangaroo rat inhabits areas of both annual grasslands and shrub communities with various soil types and slopes up to 22 percent.

Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*)

The Tipton kangaroo rat is one of three subspecies of the San Joaquin kangaroo rat (*Dipodomys nitratoide*s ssp.), morphologically distinguished by being larger than the Fresno kangaroo rat (*Dipodomys nitratoides exilis*) and smaller than the short-nosed kangaroo rat (*Dipodomys nitratoides brevinasus*). Kangaroo rat adaptations for two-footed hopping include elongated hind limbs and a long, tufted tail for balance. Tipton kangaroo rats eat mostly seeds. Burrow systems, normally less than 10 inches deep, are usually in open areas.

Flat terrain not subject to flooding is essential for permanent occupancy by Tipton kangaroo rats. Valley saltbush scrub and valley sink scrub communities provide the habitat for the Tipton kangaroo rat. They occupy alluvial fan and floodplain soils ranging from fine sands to clay-sized particles with high salinity. Level- to nearly-level terrains are occupied. Although Tipton kangaroo rats occur in terrace grasslands devoid of woody shrubs, sparse-to-moderate shrub cover is associated with populations of high density.

San Joaquin Kit Fox (*Vulpes macrotis mutica*)

The San Joaquin kit fox is the larger of two subspecies of the kit fox, *Vulpes macrotis*, the smallest canid species in North America. The San Joaquin kit fox, on average, weighs 5 pounds, and stands 12 inches tall. It has a small slim body, large close-set ears, and a long bushy tail that tapers at the tip. Depending on location and season, the fur coat of the kit fox varies in color and texture from buff to tan or yellowish-grey. The tail is distinctly black-tipped. Kit fox are an arid-land-adapted species and typically occur in desert-like habitats in North America.

They historically ranged in alkali scrub/shrub and arid grasslands throughout the level terrain of the San Joaquin Valley floor from southern Kern County north to Tracy in San Joaquin County, and up into more gradual slopes of the surrounding foothills and adjoining valleys of the interior Coast Range. Within this range, the kit fox has been associated with areas having open, level, sandy ground that is relatively stone-free to depths of about 3 to 4.5 feet. The San Joaquin kit fox utilizes subsurface dens, which may extend to 6 feet or more below ground surface, for shelter and for reproduction. Kit fox subspecies are absent or scarce in areas where soils are shallow due to high water tables, impenetrable hardpans, or proximity to parent material, such as bedrock. The kit fox also does not den in saturated soils or in areas subjected to periodic flooding

The San Joaquin kit fox is primarily nocturnal. The kit fox diet varies geographically, seasonally, and annually. It includes nocturnal rodents such as kangaroo rats, white-footed mice and pocket mice (*Peromyscus* spp.), California ground squirrels (*Spermophilus beecheyi*), rabbits (*Sylvilagus* spp.) and hares (*Lepus* spp.), San Joaquin antelope squirrels (*Ammospermophilus nelsoni*), and ground-nesting birds.

Habitat associated with kit fox consists of alkali sink and alkali flat habitat types, with dominant plant species including *Atriplex polycarpa* (saltbush), *Allenrolfea occidentalis* (iodine bush), *Amaranthus albus* (tumbleweed*), Frankenia grandifolia* (alkali heath), and *Salicornia subterminalis* (pickleweed) widely spaced. In most other areas of the valley and surrounding lower foothills, kit fox is found in annual grassland habitat typified by *Bromus* spp. (brome grass), *Festuca* spp. (fescue), *Avena fatua (*wild oats), *Hordeum* spp. (barley), and *Erodium* (filaree). Kit fox presence is generally negatively associated with rugged topography.

Critical Habitat

The Project area is not located within or directly adjacent to any designated Critical Habitat.

EXISTING CONDITION – AFFECTED ENVIRONMENT

The community of Buttonwillow is situated in Kern County at the southern end of the San Joaquin Valley, and is bound by the Coast Range to the west, the Transverse Range (San Emigdio Mountains) to the south, and the Sierra Nevada (including the Tehachapi Mountains) to the east. Prior development activities have altered the current environment and native plants have for the most part been removed as a result. The climate here is arid.

On April 16 and May 6, 2019, Ecologist Shay Lawrey conducted field surveys of the Project area with focus on potential habitat for federally listed species and migratory birds. Ms. Lawrey is a qualified biologist with advanced degrees in Biology and 20 years of experience surveying for the sensitive species known to occur in California. She surveyed the Project area on a calm weather days, during peak animal activity, between 7:00 a.m. and 4:30 p.m. General wildlife species were detected during field surveys by sight, calls, tracks, scat, or other signs. In addition to species observed, expected wildlife usage of the site was determined according to known habitat preferences of regional wildlife species and knowledge of their relative distributions in the area. Ms. Lawrey assessed the Project area for habitat type structure, species composition/association, condition and human disturbances. The main focus of the surveys was to identify sensitive species and habitat including jurisdictional waters and to evaluate the potential for sensitive species to occur within the Project area.

The project will take place within a fenced treatment plant with a connecting pipeline that will be installed along an existing dirt access road, across a canal and within an existing paved roadway. The surroundings consist of residential and agricultural development.

A vacant parcel located to southwest of the treatment plant contains suitable habitat for San Joaquin kit fox, giant kangaroo rat and Tipton kangaroo rat. Kangaroo rat footprints were noted outside of the treatment plant adjacent to the west side of the access road. Although this area is outside of the project footprint, it should be noted that there is potential for sensitive resources here.

EFFECTS ANALYSIS

Federal Endangered Species Act (ESA)

The USFWS administers the federal ESA of 1973. The ESA provides a legal mechanism for listing species as either threatened or endangered, and a process of protection for those species listed. Section 9 of the ESA prohibits "take" of threatened or endangered species. The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct. "Take" can include adverse modification of habitats used by a threatened or endangered species during any

portion of its life history. Under the regulations of the ESA, the USFWS may authorize "take" when it is incidental to, but not the purpose of, an otherwise lawful act. Take authorization can be obtained under Section 7 or Section 10 of the act.

Since suitable habitat for San Joaquin kit fox, giant kangaroo rat and Tipton kangaroo rat occurs adjacent to treatment plant site and dirt access road, there is a potential for indirect impacts in the form of harassment to federally protected species.

California Endangered Species Act (CESA)

The CDFW administers the State CESA. The State of California considers an endangered species one whose prospects of survival and reproduction are in immediate jeopardy. A threatened species is one present in such small numbers throughout its range that it is likely to become an endangered species soon, in the absence of special protection or management. And a rare species is one present in such small numbers throughout its range that it may become endangered if its present environment worsens. Rare species applies to California native plants. Further, all raptors and their nests are protected under Section 3503.5 of the California Fish and Game Code (FGC). Species of Special Concern (SSC) is an informal designation used by CDFW for some declining wildlife species that are not proposed for listing as threatened or endangered. This designation does not provide legal protection but signifies that these species are recognized as sensitive by CDFW.

Although suitable habitat for San Joaquin kit fox and Tipton kangaroo rat occurs adjacent to treatment plant site and dirt access road, there is no potential for impacts to these species in the form of take as defined in the CESA. This project will not result in the direct take of a State-listed species.

Coastal Barriers Resources Act Resources

The Coastal Barrier Resources Act (CBRA) was passed by Congress in 1982 to encourage conservation of hurricane-prone, biologically rich coastal barriers. CBRA prohibits most new federal expenditures that encourage development or modification of coastal barriers. CBRA boundaries are shown on maps that were originally adopted by Congress and are maintained by the USFWS.

Currently, the coastal barrier resource systems are located along the Atlantic and Gulf Coasts of the United States and the shore areas of the Great Lakes. Therefore, the Project is not located in a Coastal Barriers Resources Act area.

Coastal Zone Management Act Resources

Coastal Zone Management Act was passed by Congress in 1972 and is administered by National Oceanic and Atmospheric Administration, (NOAA). It provides for the management of the nation’s coastal resources, including the Great Lakes. The goal is to “preserve, protect, develop, and where possible, to restore or enhance the resources of the nation’s coastal zone.”

The Project is not located in a Coastal Zone where the provisions of this Act would be applicable.

Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) is the primary law governing marine fisheries management in U.S. federal waters. First passed in 1976, the Magnuson-Stevens Act fosters long-term biological and economic sustainability of our nation's marine

fisheries out to 200 nautical miles from shore. The goals of the act include: prevent overfishing; rebuild overfished stocks; increase long-term economic and social benefits; use reliable data and sound science; conserve essential fish habitat; ensure a safe and sustainable supply of seafood.

The Project is not located within 200 nautical miles from shore, nor does it impact any essential fish habitat that would impact regulated areas within 200 nautical miles from shore.

Protection of Wetlands – Executive Order 11990

Protection of Wetlands – Executive Order 11990: The purpose of Executive Order (EO) 11990 is to "minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands". To meet these objectives, the Order requires federal agencies, in planning their actions, to consider alternatives to wetland sites and limit potential damage if an activity affecting a wetland cannot be avoided. The procedures require the determination of whether or not the proposed project will be in or will affect wetlands. If so, a wetlands assessment must be prepared that describes the alternatives considered. The procedures include a requirement for public review of assessments. The evaluation process follows the same 8 steps as for EO 11988, Floodplain Management.

Wetlands are at the transition between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. Wetlands have one or more of the following three attributes: 1) at least periodically, the land supports predominantly hydrophytes; 2) soils are undrained; and 3) the substrate is saturated with water or covered by shallow water at some time during the growing season of each year. Under current guidelines, a federal jurisdictional wetland must display all three wetland characteristics: hydrophytic vegetation, hydric soils, and wetland hydrology. In California however, a jurisdictional wetland needs to meet only one of these parameters.

No drainages or indications of wetlands, hydric soils, naturally occurring indicator plant species were observed during the field survey nor are any expected to occur. There are no jurisdictional wetlands within or immediately adjacent to any of the Project components identified in the Project description. No impact to wetland areas will result from implementation of the proposed Project.

Migratory Bird Treaty Act (MBTA)

The federal Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C 703-711) provides protection for nesting birds that are both residents and migrants whether or not they are considered sensitive by resource agencies. The MBTA makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed under 50 CFR 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). The direct injury or death of a migratory bird, due to construction activities or other construction-related disturbance that causes nest abandonment, nestling abandonment, or forced fledging would be considered take under federal law. The USFWS, in coordination with the CDFW administers the MBTA. CDFW's authoritative nexus to MBTA is provided in FGC Sections 3503.5 which protects all birds of prey and their nests and FGC Section 3800 which protects all non-game birds that occur naturally in the State.

Vegetation suitable for nesting birds does exist within the treatment plant basins and adjacent to the Project area. As discussed, most birds are protected by the MBTA. In general, impacts to all bird species (common and special status) can be avoided by conducting work outside of the nesting season, which is generally January/February to August/September, and by conducting worker environmental awareness training. However, if all work cannot be conducted outside of nesting season, a Project-specific Nesting Bird Management Plan can be prepared to determine suitable buffers.

Preconstruction Nesting Bird Surveys are recommended prior to the commencement of any Project activities that may occur within the nesting season (February to September), to avoid any potential Project-related impacts to nesting birds within the Project area.

Wild and Scenic Rivers Act.

Wild and Scenic Rivers Act. The National Wild and Scenic Rivers System was created by Congress in 1968 (Public Law 90-542; 16 U.S.C. 1271 et seq.) to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. The Act is notable for safeguarding the special character of these rivers, while also recognizing the potential for their appropriate use and development. It encourages river management that crosses political boundaries and promotes public participation in developing goals for river protection. Rivers may be designated either a federal or state agency. As of 2019, there were 22 water body sections that have a wild and scenic river designation in California.

The Project is not located within a water body that is designated by the Wild and Scenic Rivers Act.

CONCLUSION

The proposed Project will not adversely affect Critical Habitat as none exists within the Project area.

The Project may affect but will not likely adversely affect the San Joaquin kit fox, giant kangaroo rat and Tipton kangaroo rat. To avoid these impacts the following recommendations are offered.

1. Install exclusionary fence along the bottom of the existing treatment plant fence.
2. Install exclusionary fence along the dirt access road that is planned for paving
3. Perform all work during daylight hours
4. Have a qualified biological monitor on site during exclusionary fence installation and during initial ground disturbing activities.
5. Have the biologist provide worker environmental awareness training.
6. Conduct a pre-construction nesting bird survey

Thank you for asking us to assist you with this project. If you have any questions or need any clarifications, contact me at (909) 915-5900 or at shay@jericho-systems.com.

Sincerely,

Shay Lawrey, President
Ecologist/Regulatory Specialist

Attachments:
Site Photos
Figures
Database Search Results

	Photo 1. Typical site existing conditions of the fenced in treatment plant site.
	Photo 2 Vegetation in treatment plant settling basin. Location with heavy bird activity.

	Photo 3. Canal that will be crossed by the associated potable water pipeline.
	Photo 4. Vacant lot SW of the treatment plant where there is suitable habitat for kitfox, giant kangaroo rat and Tipton kangaroo rat.

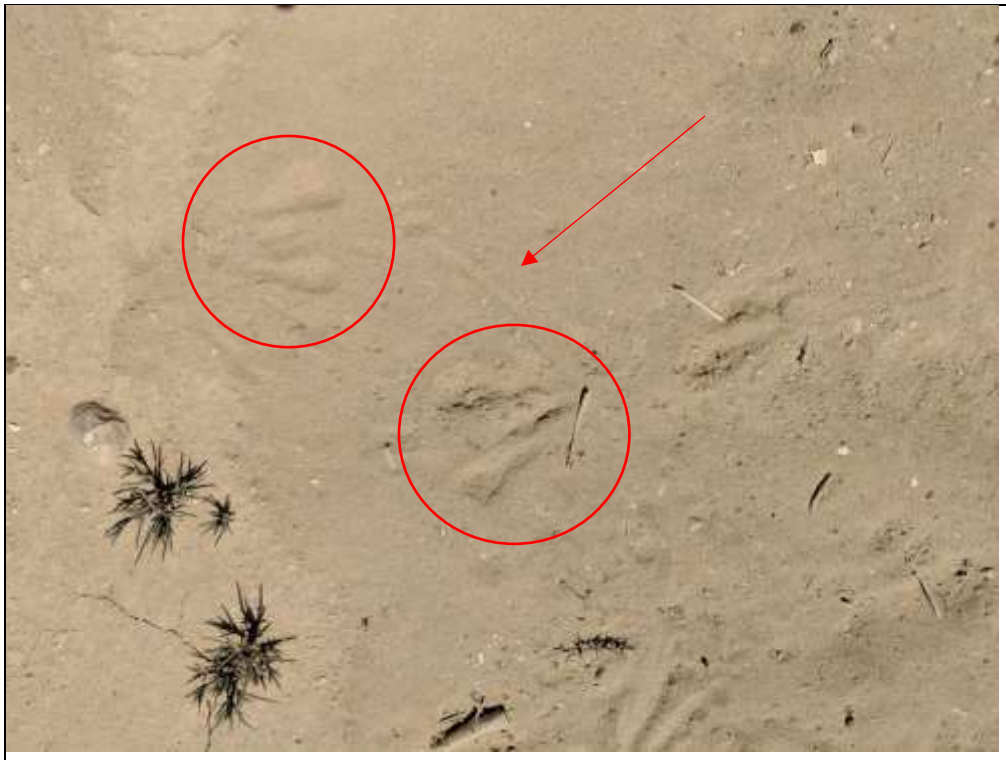
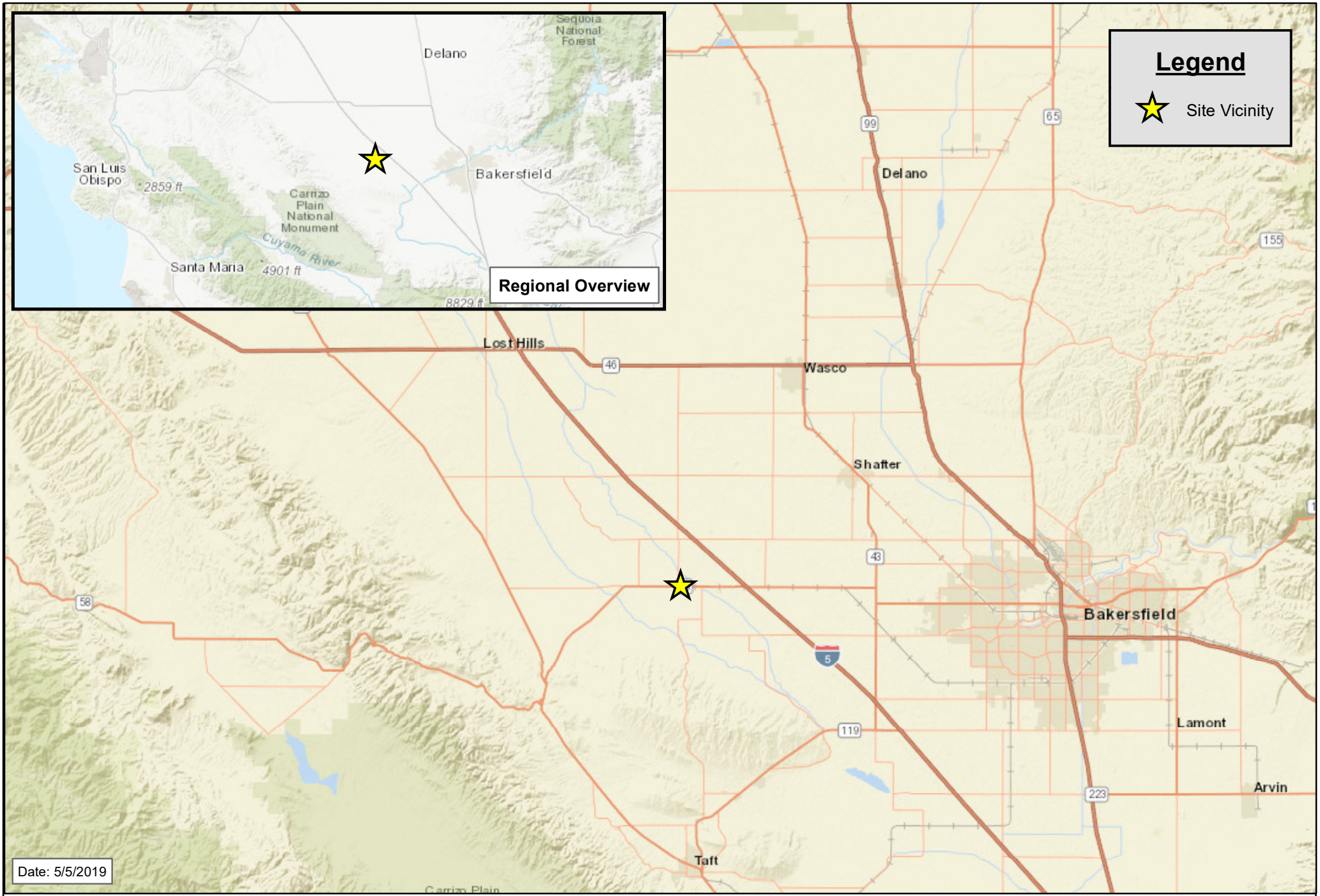


Photo 5. Showing kangaroo rat tracks. Hind feet in circles and tail drag pointed to by arrow.

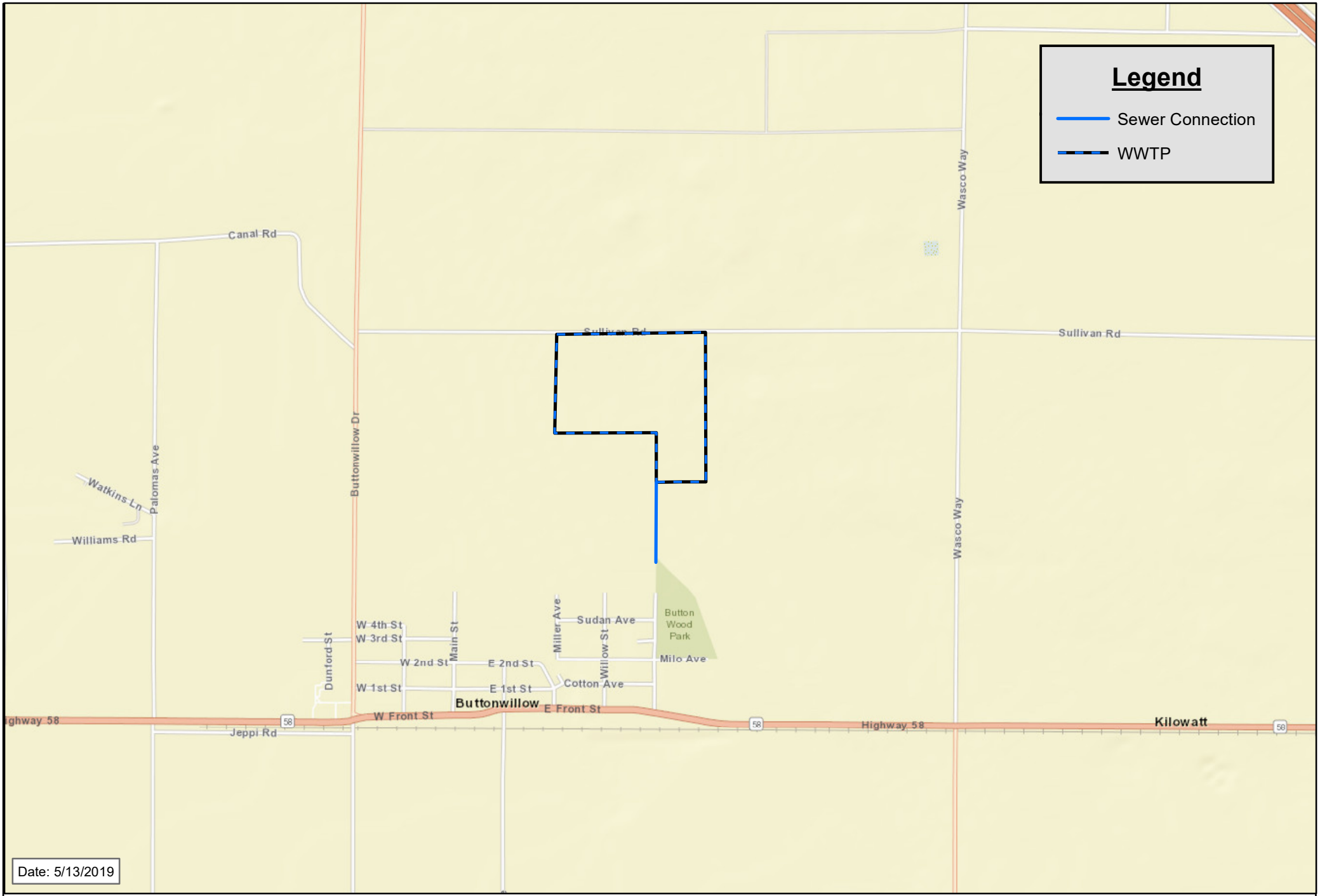


Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

JERICHO SYSTEMS INCORPORATED

Figure 1 - Regional Overview Site Vicinity

Buttonwillow County Water District
WWTP Improvement Alternatives Project

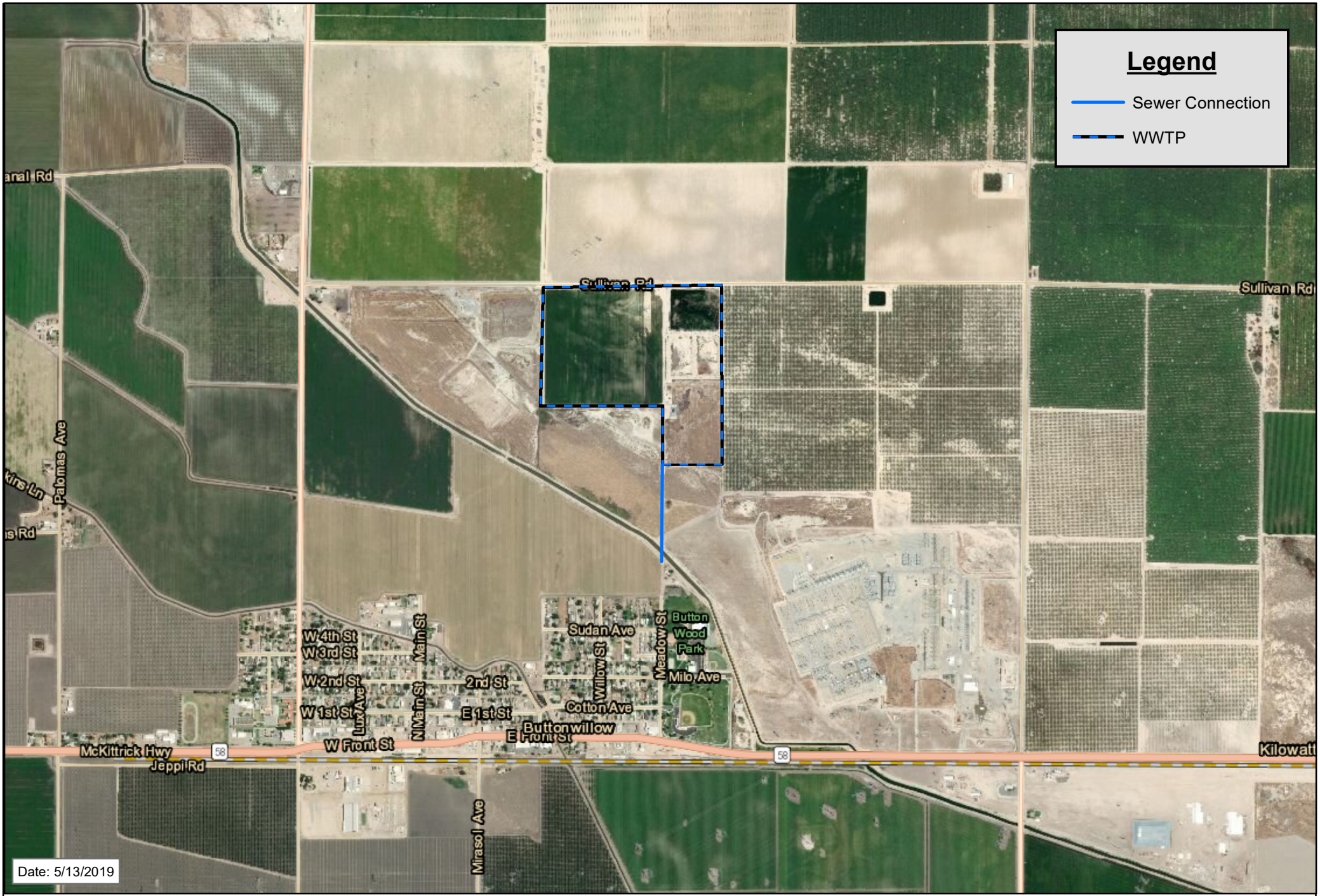


Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

JERICHO SYSTEMS INCORPORATED

Figure 2
Site Location

Buttonwillow County Water District
WWTP Improvement Alternatives Project



Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors
Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA,

JERICHO SYSTEMS INCORPORATED

Figure 3
Site Location

Buttonwillow County Water District
WWTP Improvement Alternatives Project

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To: May 04, 2019
Consultation Code: 08ESMF00-2019-SLI-1834
Event Code: 08ESMF00-2019-E-05897
Project Name: Buttonwillow County Water District Wastewater Treatment Facility

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

Project Summary

Consultation Code: 08ESMF00-2019-SLI-1834

Event Code: 08ESMF00-2019-E-05897

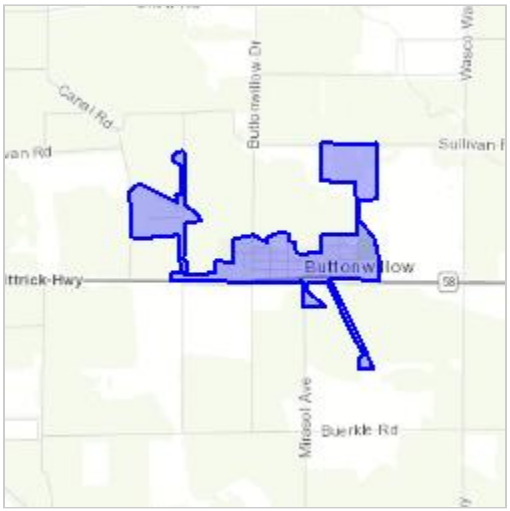
Project Name: Buttonwillow County Water District Wastewater Treatment Facility

Project Type: WASTEWATER FACILITY

Project Description: Wastewater Treatment Plant Improvement Alternatives Project

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/35.401800604307404N119.46737949452665W



Counties: Kern, CA

Endangered Species Act Species

There is a total of 10 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Buena Vista Lake Ornate Shrew *Sorex ornatus relictus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1610	Endangered
Giant Kangaroo Rat *Dipodomys ingens* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6051	Endangered
San Joaquin Kit Fox *Vulpes macrotis mutica* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2873	Endangered
Tipton Kangaroo Rat *Dipodomys nitratoides nitratoides* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7247 Species survey guidelines: https://ecos.fws.gov/ipac/guideline/survey/population/40/office/11420.pdf	Endangered

Reptiles

NAME	STATUS
Blunt-nosed Leopard Lizard *Gambelia silus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/625	Endangered
Giant Garter Snake *Thamnophis gigas* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4482	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened

Fishes

NAME	STATUS
Delta Smelt *Hypomesus transpacificus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/321	Threatened

Crustaceans

NAME	STATUS
Vernal Pool Fairy Shrimp *Branchinecta lynchi* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/498	Threatened

Flowering Plants

NAME	STATUS
San Joaquin Wooly-threads *Monolopia (=Lembertia) congdonii* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3746	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

CNPS California Native Plant Society

Plant List

Inventory of Rare and Endangered Plants

6 matches found. *Click on scientific name for details*

Search Criteria

Found in Quad 3511944

Modify Search Criteria | Export to Excel | Modify Columns | Modify Sort | Display Photos

Scientific Name	Common Name	Lifeform	Blooming Period	CA Rare Plant Rank	State Listing Status	Federal Listing Status	Habitats
Atriplex cordulata var. erecticaulis	Earlimart orache	annual herb	Aug-Sep(Nov)	1B.2			• Valley and foothill grassland
Atriplex minuscula	lesser saltscale	annual herb	May-Oct	1B.1			• Chenopod scrub • Playas • Valley and foothill grassland
Atriplex subtilis	subtle orache	annual herb	Jun,Aug,Sep(Oct)	1B.2			• Valley and foothill grassland
Eremalche parryi ssp. kernensis	Kern mallow	annual herb	Jan,Mar,Apr,May(Feb)	1B.2		FE	• Chenopod scrub • Pinyon and juniper woodland • Valley and foothill grassland
Eriastrum hooveri	Hoover's eriastrum	annual herb	(Feb)Mar-Jul	4.2			• Chenopod scrub • Pinyon and juniper woodland • Valley and foothill grassland
Monolopia congdonii	San Joaquin woollythreads	annual herb	Feb-May	1B.2		FE	• Chenopod scrub • Valley and foothill grassland (sandy)

Suggested Citation

California Native Plant Society, Rare Plant Program. 2019. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website http://www.rareplants.cnps.org [accessed 04 May 2019].

Search the Inventory
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About the Inventory
About the Rare Plant Program
CNPS Home Page
About CNPS
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Contributors
The Calflora Database
The California Lichen Society
California Natural Diversity Database
The Jepson Flora Project
The Consortium of California Herbaria
CalPhotos

Questions and Comments
rareplants@cnps.org

Selected Elements by Common Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Buttonwillow (3511944))
 AND (Federal Listing Status IS (Endangered OR Threatened) OR State Listing Status IS (Endangered OR Threatened))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
blunt-nosed leopard lizard *Gambelia sila*	ARACF07010	Endangered	Endangered	G1	S1	FP
Buena Vista Lake ornate shrew *Sorex ornatus relictus*	AMABA01102	Endangered	None	G5T1	S1	SSC
giant gartersnake *Thamnophis gigas*	ARADB36150	Threatened	Threatened	G2	S2	
Kern mallow *Eremalche parryi ssp. kernensis*	PDMAL0C031	Endangered	None	G3G4T3	S3	1B.2
Nelson's antelope squirrel *Ammospermophilus nelsoni*	AMAFB04040	None	Threatened	G2	S2S3	
San Joaquin kit fox *Vulpes macrotis mutica*	AMAJA03041	Endangered	Threatened	G4T2	S2	
Tipton kangaroo rat *Dipodomys nitratoides nitratoides*	AMAFD03152	Endangered	Endangered	G3T1T2	S1S2	

Record Count: 7

APPENDIX 4

IDENTIFICATION AND EVALUATION OF HISTORIC PROPERTIES

BUTTONWILLOW COUNTY WATER DISTRICT WASTEWATER TREATMENT PLANT IMPROVEMENTS PROJECT

Near the Community of Buttonwillow
Kern County, California

For Submittal to:

Buttonwillow County Water District
289 N. Main Street
Buttonwillow, CA 93206
and
State Water Resources Control Board
1001 I Street/P.O. Box 944212
Sacramento, CA 94244

Prepared for:

Tom Dodson & Associates
2150 N. Arrowhead Avenue
San Bernardino, CA 92405

Prepared by:

CRM TECH
1016 E. Cooley Drive, Suite A/B
Colton, CA 92324

Bai "Tom" Tang, Principal Investigator
Michael Hogan, Principal Investigator

October 14, 2022
CRM TECH Contract No. 3856

Title: Identification and Evaluation of Historic Properties: Buttonwillow County Water District Wastewater Treatment Plant Improvements Project, near the Community of Buttonwillow, Kern County, California

Author(s): Bai "Tom" Tang, Principal Investigator/Historian
Deirdre Encarnación, Archaeologist/Report Writer
Hunter O'Donnell, Archaeologist

Consulting Firm: CRM TECH
1016 E. Cooley Drive, Suite A/B
Colton, CA 92324
(909) 824-6400

Date: October 14, 2022

For Submittal to: Buttonwillow County Water District
289 N. Main Street
Buttonwillow, CA 93206
(661) 764-5405
and
State Water Resources Control Board
1001 I Street/P.O. Box 944212
Sacramento, CA 95814
(916) 341-5057

Prepared for: Tom Dodson, President
Tom Dodson & Associates
2150 N. Arrowhead Avenue
San Bernardino, CA 92405
(909) 882-3612

USGS Quadrangle: Buttonwillow, Calif., 7.5' quadrangle (Section 13, T29S R23E, Mount Diablo Baseline and Meridian)

Project Size: Approximately 16.7 acres and 0.6 linear mile of pipeline right-of-way

Keywords: Southern San Joaquin valley; Phase I historical/archaeological resources survey; portion of Site 15-13735: East Side Canal; Isolates 3856-1*, -2*, and -3*: lithic flakes in disturbed context; Site 3856-4H*: wastewater treatment plant; no "historic properties" or "historical resources" affected

** Temporary designations, pending assignment of official identification numbers in the California Historical Resources Inventory*

EXECUTIVE SUMMARY

Between March and October 2022, at the request of Tom Dodson & Associates, CRM TECH performed a cultural resources study on the Area of Potential Effects (APE) for the Buttonwillow County Water District (BCWD) Wastewater Treatment Plant (WWTP) Improvements Project near the unincorporated community of Buttonwillow, Kern County, California. The APE consists of approximately 16.7 acres of land and 0.6 linear mile of pipeline right-of-way in and around the existing WWTP, located on the south side of Sullivan Road between Buttonwillow Drive and Wasco Way, in the west half of Section 13, T29S R23E, Mount Diablo Baseline and Meridian, as depicted in the United States Geological Survey Buttonwillow, California, 7.5' quadrangle.

The proposed undertaking entails primarily the expansion of and improvement to the existing WWTP, including the construction of a new headwork, an operations building, a motor control center, a paved access road, and other ancillary facilities. The maximum depth of excavation required for the undertaking, or the vertical extent of the APE, will not exceed 10 feet. As a part of the environmental review process for the undertaking, the study is required by BCWD and the State Water Resources Control Board (SWRCB) in compliance with the California Environmental Quality Act (CEQA) and Section 106 of the National Historic Preservation Act (NHPA), in a process known as CEQA-Plus.

The purpose of the study is to provide BCWD and SWRCB with the necessary information and analysis to determine whether the proposed undertaking would have an effect on any "historic properties," as defined by 36 CFR 800.16(l), or "historical resources" as defined by Calif. PRC §5020.1(j), that may exist in or near the APE. In order to accomplish this objective, CRM TECH conducted a cultural resources records search, historical and geoarchaeological background research, Native American consultation, and an intensive-level field survey of the entire APE.

As a result of these research procedures, five cultural resources were identified as lying within or partially within the APE, as listed below:

- Site 15-13735: East Side Canal, circa 1870s;
- Isolate 3856-1*: prehistoric lithic flake;
- Isolate 3856-2*: prehistoric lithic flake;
- Isolate 3856-3*: prehistoric lithic flake;
- Site 3856-4H*: existing BCWD WWTP, circa 1956-1967.

* *Temporary designations, pending assignment of official identification numbers in the California Historical Resources Inventory*

Among these, the East Side Canal was previously determined ineligible for listing in the National Register of Historic Places or the California Register of Historical Resources, mainly due to the lack of historic integrity. Within regards to the short segment of the canal across the linear portion of the APE, the present study concurs with this determination. Similarly, the existing WWTP has been significantly expanded and upgraded with modern equipment in recent years and does not retain sufficient integrity to relate to the historic period. Furthermore, it does not meet any of the criteria for listing in the National Register or the California Register. Therefore, neither of the two sites qualify as a "historic property" under Section 106 provisions or a "historical resource" under CEQA.

Each of the three prehistoric isolates consists of a single lithic flake that appears to represent the result of secondary deposition from unknown origins. Such isolates, or localities with fewer than three artifacts, by definition do not qualify as archaeological sites due to the lack of contextual integrity. As such, they do not constitute potential "historic properties"/"historical resources" and require no further consideration. No other features or artifacts of prehistoric or historical origin were encountered within or adjacent to the APE, and the extensively disturbed subsurface sediments in the vertical APE appear to be relatively low in sensitivity for potentially significant archaeological remains of prehistoric or early historic origin.

Based on the research results summarized above, and pursuant to 36 CFR 800.4(d)(1) and Calif. PRC §21084.1, CRM TECH recommends to BCWD and SWRCB a conclusion that *no "historic properties" or "historical resources" will be affected by the proposed undertaking*. No further cultural resources investigation is recommended for the undertaking unless project plans undergo such changes as to include areas not covered by this study. However, if buried cultural materials are discovered during earth-moving operations associated with the undertaking, all work in the immediate area should be halted or diverted until a qualified archaeologist can evaluate the nature and significance of the find.

TABLE OF CONTENTS

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INTRODUCTION

Between March and October 2022, at the request of Tom Dodson & Associates, CRM TECH performed a cultural resources study on the Area of Potential Effects (APE) for the Buttonwillow County Water District (BCWD) Wastewater Treatment Plant (WWTP) Improvements Project near the unincorporated community of Buttonwillow, Kern County, California (Fig. 1). The APE consists of approximately 16.7 acres of land and 0.6 linear mile of pipeline right-of-way in and around the existing WWTP, located on the south side of Sullivan Road between Buttonwillow Drive and Wasco Way, in the west half of Section 13, T29S R23E, Mount Diablo Baseline and Meridian, as depicted in the United States Geological Survey (USGS) Buttonwillow, California, 7.5' quadrangle (Figs. 2, 3).

The proposed undertaking entails primarily the expansion of and improvement to the existing WWTP, including the construction of a new headwork, an operations building, a motor control center, a paved access road, and other ancillary facilities. The maximum depth of excavation required for the undertaking, or the vertical extent of the APE, will not exceed 10 feet. As a part of the environmental review process for the undertaking, the study is required by BCWD and the State Water Resources Control Board (SWRCB) in compliance with the California Environmental Quality Act (CEQA) and Section 106 of the National Historic Preservation Act (NHPA), in a process known as CEQA-Plus.

The purpose of the study is to provide BCWD and SWRCB with the necessary information and analysis to determine whether the proposed undertaking would have an effect on any "historic

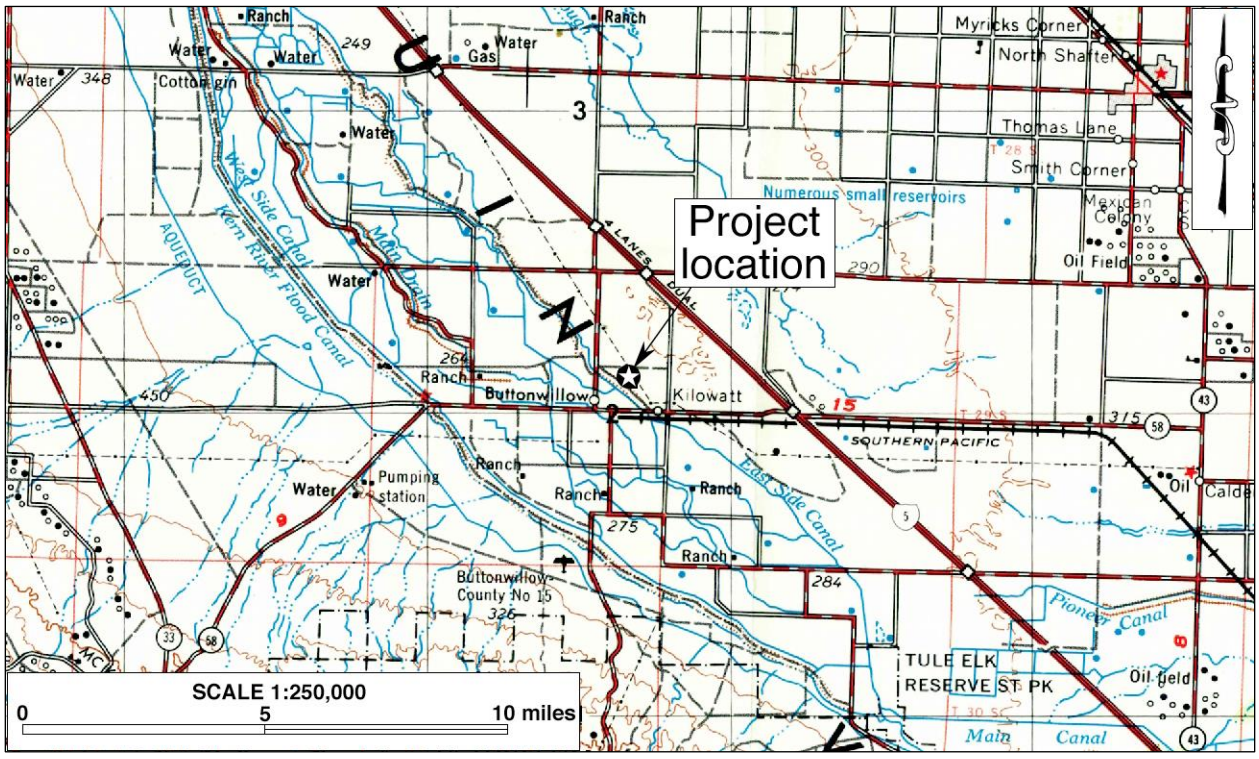

Figure 1. Project vicinity. (Based on USGS Bakersfield, Calif., 120'x60' quadrangle [USGS 1971])

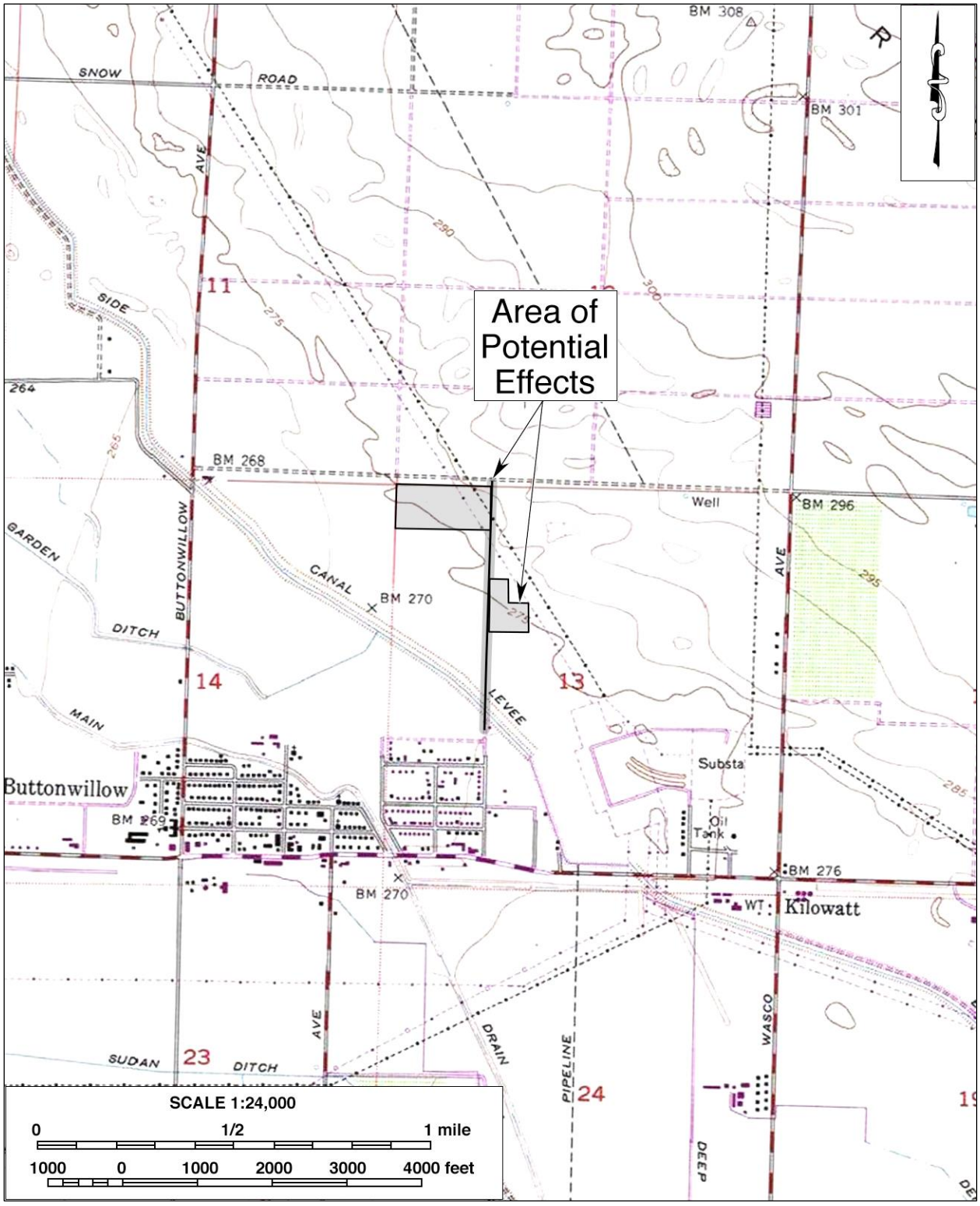

Figure 2. Area of Potential Effects (APE). (Based on USGS Buttonwillow, Calif., 7.5' quadrangle [USGS 1973])

Figure 3. Recent satellite image of the APE. (Based on Google Earth imagery)

properties," as defined by 36 CFR 800.16(l), or "historical resources" as defined by Calif. PRC §5020.1(j), that may exist in or near the APE. In order to accomplish this objective, CRM TECH conducted a cultural resources records search, historical and geoarchaeological background research, Native American consultation, and an intensive-level field survey of the entire APE. The following report is a complete account of the methods and results of the various avenues of research and the final conclusion of the study. Personnel who participated in the study are named in the appropriate sections, and their qualifications are provided in Appendix 1.

SETTING

CURRENT NATURAL SETTING

Kern County covers a total of 8,172 square miles, measuring 66 miles from north to south and 130 miles from east to west. The county overlaps five of California's 13 geomorphic provinces, the three most prominent ones being the San Joaquin or Great Interior Valley of California, the southern Sierra Nevada, and the western portion of the Mojave Desert. The small town of Buttonwillow, primarily a farming community, sits at the southern end of the San Joaquin Valley, which is bound by the Coast Range to the west, the Transverse Range (San Emigdio Mountains) to the south, and the Sierra Nevada (including the Tehachapi Mountains) to the east.

The APE is located to the north of Buttonwillow, surrounded mostly by agricultural fields with some open land also present, including the now-closed Buttonwillow Sanitary Landfill on the adjacent property to the west (Fig. 3). Three high-voltage power transmission lines, part of the Pacific Gas and Electric Company's Path 15 system, traverse the APE in a northwest-southeast direction and lead to the Midway Substation on the east side of Buttonwillow, with two of the steel lattice towers standing within the APE boundaries.

The APE consists of a larger, rectangular northwestern portion and a smaller, irregularly shaped southeastern portion, with the proposed pipeline alignment traversing north-south between the two (Figs. 2, 3). The southeastern portion contains a part of the existing WWTP, which features two biological treatment systems and other associated facilities, surrounded by unused vacant land. The northwestern portion is currently farmland used by BCWD for disposal of wastewater on non-human consumption agriculture (Provost & Pritchard Consulting Group 2018:2-1; Fig. 4). The linear portion of the APE coincides with an unpaved segment of Meadow Street lying across the East Side Canal, flanked mostly by current or former agricultural fields.

The terrain in the APE is generally level, with elevations ranging approximately from 275 feet to 280 feet above mean sea level. Surface soils in the APE consist of light brown to brown alluvium with very few rock inclusions. The farmland in the northwestern portion appears to rest partially on an artificial terrace, with a four- to five-foot drop in elevation further to the south. Much of the APE appears to have been recently disked, and the ground cover was sparse at the time of the survey, with the exception of thick stands of ruderal amaranth. Other than that, the vegetation observed in the APE also included Russian thistle, seablite, silverleaf nightshade, and other small brush and grasses (Fig. 4).

Figure 4. Overview of the current condition of the APE. (Photograph taken on May 5, 2022; view to the southeast)

CULTURAL SETTING

Archaeological Context

The earliest evidence of human occupation in the southern San Joaquin Valley, discovered at the Witt locality at Tulare Lake and published by West et al. in 1991, included some of the oldest human skeletal materials in North America (Garfinkel 2015:3). Uranium-thorium testing at the Witt locality resulted in uncalibrated dates of 11,379, 11,380, and 15,802 years before the present (B.P.; *ibid*). The Tulare Lake area has been documented as one of the richest Paleoindian localities in the State of California (*ibid.*).

The cultural history of the region has been summarized into several chronologies, integrating available archaeological data from many studies conducted in the southern Sierra Nevada. The prehistory of the greater southern San Joaquin Valley has been the focus of McGuire and Garfinkel (1980), whose work has been utilized to create prehistoric phases for the region from 4000 B.C. to present times (Moratto 1984:333; Getchell and Atwood 2009:6). More recently, the following general framework proposes three primary periods, based on Garfinkel (2015), although the

beginning and ending dates of the recognized cultural horizons vary among different parts of the region:

- Paleoindian Period (ca. 16,000-8,550 B.P.): Native peoples of this period created fluted spearhead bases designed to be hafted to wooden shafts, possibly indicative of hunting now-extinct megafauna. The distinctive method of thinning bifaces and spearhead preforms by removing long, linear flakes left diagnostic Paleoindian markers at tool-making sites. Other artifacts associated with the Paleoindian toolkit include choppers, cutting tools, retouched flakes, and perforators. Sites from this period are very rare, and most are deeply buried.
- Archaic Period (ca. 8,550 B.P.-1000 A.D.): Archaic sites are characterized by abundant lithic scatters of considerable size with many biface thinning flakes, bifacial preforms broken during manufacture, and well-made groundstone bowls and basin metates. Diverse architectural features such as house floors and significant deposits of refuse materials reflect both land- and water-associated subsistence activities. Cultural materials from the Archaic Period include temporally diagnostic forms of beads and ornaments manufactured from *Haliotis* and *Olivella* shells. Spindle-shaped charmstones are also found. The Archaic Period can be further broken down into lower, middle, and upper phases.
- Emergent Period (ca. 1000-1776 A.D.): Sites from this period typically contain lithic scatters from the manufacture of small arrow points, expedient groundstone tools such as tabular metates and unshaped manos, wooden mortars with stone pestles, acorn or mesquite bean granaries, ceramic vessels, shell beads suggestive of extensive trading networks, and steatite implements such as pipes and arrow shaft straighteners. The bow and arrow replace the dart and atlatl at sites from the Emergent Period. Specialized sites of local shell bead manufacturing are recognized by the presence of bead blanks and manufacturing debris, a pattern that might indicate the introduction of monetized systems of exchange.

Ethnohistoric Context

The Buttonwillow area is generally considered a part of the traditional homeland of the Southern Valley Yokuts, near its northern limits. Roughly a half-mile to the west of the APE sits California Historical Landmark No. 492, the Buttonwillow Tree, which is recognized as a sacred Yokut meeting ground/dance ground. The territory of the Southern Valley Yokuts extended from the southern San Joaquin Valley, between the San Joaquin River and the lower Kings River, to the Tehachapi Mountains. The Northern Valley Yokuts lived to the north in the San Joaquin Valley, and the Foothill Yokuts lived in the foothills around the valley. The main cultural differences between these groups stemmed from the availability and use of different natural resources in the areas where they occupied. The following ethnographic discussion of the Southern Valley Yokuts is based mainly on Wallace (1978).

The family formed the basic domestic and economic unit in the Southern Valley Yokuts society, although another key grouping was the patrilineal, exogamous, totemic lineage. Lineages in the northern portion of the tribal territory, where the APE is located, were also connected to one of two patrilineal moieties. There was no over-arching political grouping or unity among the Southern Valley Yokuts, and localized groups collectively controlled tribal lands with the resources shared by members. Their society differed from that of the Northern Valley Yokuts due to both ecological factors and cultural influence from the Emigdiano and Kitanemuk to the south.

The Southern Valley Yokuts sustained themselves with fish, waterfowl, shellfish, roots, and seeds found in abundance near the many rivers, lakes, sloughs, and the seasonal marshes. Baskets were important in securing and processing foods, along with nets, sinew-backed bows, stone-tipped arrows, and stone scrapers. Stone mortars, wooden mortars, and pestles were obtained through trade, as were the lithic materials used to make stone tools. Perforated marine shell disks were used as currency. There is no evidence of clay vessel manufacturing among the Southern Valley Yokuts, probably due to their skill in basket making and a preferential use of baskets in daily chores.

The native lifestyle of the Southern Valley Yokuts received little influence from early, casual contacts with Spaniards in the late 1700s and early 1800s. In 1833, however, an epidemic of introduced disease devastated the native population with an estimated 75 percent mortality rate. After the annexation of California by the U.S., the decline of Southern Valley Yokuts population and culture accelerated as Euroamerican settlers overran the tribal territory and displaced the native people. The Southern Valley Yokuts were interned on the Tejon Reservation and later on the Tule River Reservation.

Historic Context

In the accounts of their 1770s expeditions, early Spanish explorers Padro Fages (1772) and Francisco Garcés (1776) described the San Joaquin Valley as a bleak and arid expanse of barren land, which undoubtedly discouraged Spanish and, later, Mexican settlement in the region (Clough and Secrest 1984:25). In the early 19th century, further Spanish and Mexican explorations occurred in the San Joaquin Valley, occasionally coming through or close to the present-day Buttonwillow area, such as the 1806 Zalvidea Expedition, the 1815 Ortega Expedition, the 1816 Martinez Expedition, and the 1928 Rodriguez Expedition (Beck and Haase 1974:20-22). Despite the repeated explorations, the southern portion of the San Joaquin Valley remained largely devoid of any non-Native population at the time of American annexation in 1848.

During the early years of the American Period, cattle ranching was the dominant economic pursuit in the San Joaquin Valley, partially in support of the Gold Rush in the Sierra Nevada (Macko et al. 1993:39; JRP and Caltrans 2000:12). Starting in the early 1860s, as the result of a devastating drought and the increased demand for wool during the Civil War, ranchers in the region turned to sheep raising instead (Macko et al. 1993:39). The most prominent ranching "empire" to emerge in the San Joaquin Valley at that time was the partnership of Henry Miller and Charles Lux. In its heyday, the Miller and Lux Corporation, headquartered in Los Banos, owned some 1,400,000 acres of land and controlled through lease and grazing arrangements ten times that much, on which the company ran a million head of cattle and over a hundred thousand sheep (Taper 1967).

The first major "growth spur" in the southern San Joaquin Valley took place between the 1860s and the 1890s, when the ever-increasing number of settlers shifted the focus of regional economy from animal husbandry to dry farming for grains, especially wheat (Robinson 1958:21). Meanwhile, the completion of the Southern Pacific Railroad in 1873-1876 and the competing San Francisco and San Joaquin Valley Railway in 1895-1897 gave rise to a string of towns across the vast stretches of farmlands (Gustafson and Serpico 1996:159). Then, from 1890 to 1910 the grain fields gradually gave way to irrigated orchards and vineyards, which were joined after 1920 by truck farms and cotton fields (Robinson 1958:26).

Throughout the late 19th and early 20th centuries, railroad and irrigation continued to drive the growth of the region. With its nearly level valley floor, the San Joaquin Valley developed some of the richest agricultural land in the United States once large-scale irrigation began. Early farming on the plains was aided by the use of dams and weirs that diverted water from the local rivers and streams, although these were mostly seasonal flows (Small and Smith 1926:567). Demand for a more reliable water supply resulted in the organization of various water districts, many of which continue to operate today.

Buttonwillow traces its history to a Miller and Lux sub-headquarters and a company store that were established near the landmark Buttonwillow Tree in 1885 (BCCA n.d.). A town site was laid out in 1895, after a rail line from Bakersfield was completed through the area two years earlier (*ibid.*). The Miller and Lux Corporation originally called the locality Buena Vista, presumably after the nearby Buena Vista Lake, but the name Buttonwillow soon prevailed (*ibid.*; Gudde 1998:50, 54). The current town site was established in 1927, and Buttonwillow has since developed into a community of family-owned agricultural businesses producing and distributing fruits, vegetables, nuts, cotton, wheat, and alfalfa (BCCA n.d.).

During the 20th century, San Joaquin Valley farmers distinguished themselves as the leading agricultural producers in California, and in some instances the entire nation. Around the turn of the century, an oil boom along the Kern River brought the Bakersfield area to the forefront of California's budding petroleum industry, where the largest oil fields in the state are still in operation (Miller 2009:3), although agriculture remained the dominant factor in the area's economy as well as its cultural heritage. However, as elsewhere in California, the housing boom in the last few decades, featuring master-planned residential communities on once-prime farmland, has played a pivotal role in the recent growth of the southern San Joaquin Valley region.

RESEARCH METHODS

RECORDS SEARCH

The records search for this study was provided by the Southern San Joaquin Valley Information Center (SSJVIC) of the California Historical Resources Information System on March 21, 2022. Located on the campus of California State University, Bakersfield, SSJVIC is the State of California's official cultural resource records repository for Kern County. During the records search, SSJVIC assistant coordinator Jeremy E. David examined maps and records on file for previously identified cultural resources and existing cultural resources studies within a one-mile radius of the APE. Previously identified cultural resources include properties designated as California Historical Landmarks or Points of Historical Interest as well as those listed in the National Register of Historic Places, the California Register of Historical Resources, or the California Historical Resources Inventory.

HISTORICAL BACKGROUND RESEARCH

Historical background research for this study was conducted by CRM TECH principal investigator/ historian Bai "Tom" Tang. Sources consulted during the research included published literature in local and regional history, historical maps of the Buttonwillow area, and aerial/satellite photographs

of the project vicinity. Among the maps consulted were U.S. General Land Office (GLO) land survey maps dated 1856 and USGS topographic maps dated 1912-1973, which are available at the websites of the U.S. Bureau of Land Management and the USGS. The aerial and satellite photographs, taken between 1952 and 2022, are available through the Google Earth software, at the Nationwide Environmental Title Research (NETR) Online website, and at the FrameFinder Online website hosted by the University of California, Santa Barbara.

NATIVE AMERICAN PARTICIPATION

On March 9, 2022, CRM TECH submitted a written request to the State of California Native American Heritage Commission (NAHC) for a records search in the commission's Sacred Lands File. Following the NAHC's recommendations and previously established consultation protocol, CRM TECH further contacted six tribal representatives in the region in writing and by telephone between May 18 and June 15, 2022, for additional information on potential Native American cultural resources in or near the APE. The correspondence between CRM TECH and the Native American representatives is attached to this report as Appendix 2.

GEOARCHAEOLOGICAL ANALYSIS

As a part of the research procedures, CRM TECH archaeologist Deirdre Encarnación pursued geoarchaeological analysis to assess the APE's potential for the deposition and preservation of subsurface cultural deposits from the prehistoric period, which cannot be detected through a standard surface archaeological survey. Sources consulted for this purpose included primarily topographic and geologic maps and reports pertaining to the surrounding area. Findings from these sources were used to develop a geomorphologic history of the APE and address geoarchaeological sensitivity of the vertical APE.

FIELD SURVEY

On May 5, 2022, CRM TECH archaeologist Hunter O'Donnell carried out the intensive-level field survey of the APE. The survey was completed on foot by walking along the entire linear portion of the APE and a series of parallel east-west transects at 15-meter (approximately 50-foot) intervals across the non-linear portion. In this way, the ground surface in the entire APE was systematically and carefully examined for any evidence of human activities dating to the prehistoric or historic period (i.e., 50 years or older). Ground visibility was mostly good to excellent (approximately 90%), especially in the recently disked agricultural field in the western portion of the APE, except where the ground is covered by pockets of thick amaranth growth around the existing WWTP, a result of the water runoff.

RESULTS AND FINDINGS

RECORDS SEARCH

Likely due to delays in processing new submittals due to facility closure during the COVID-19 pandemic, SSJVIC maps show no previous cultural resources studies within the APE. However, CRM TECH has previously completed two Phase I studies for an earlier version of the proposed

project, which covered a larger area than the current APE. A survey that included the non-linear portion of the APE in its entirety was completed in 2019 (Tang et al. 2019), and an addendum focusing on the pipeline alignment, extending further to the south at the time, was completed in 2020 (Tang 2020). Outside the APE but within the one-mile scope of the records search, SSJVIC records identify a total of 19 existing studies on various tracts of land and linear features, including the adjacent property to the west.

As a result of these past survey efforts, 14 historical/archaeological sites and one isolate—i.e., a locality with fewer than three artifacts—were previously recorded within the one-mile radius, as listed below in Table 1.

Table 1. Previously Recorded Cultural Resources within the Scope of the Records Search
(See App. 3 for resource locations)

Resource No.	Description
15-000052	Surface scatter of steatite sherds
15-002673	Lithic scatter
15-004014	Lithic scatter, habitation debris, and burials
15-004621	Isolate: chalcedony flake
15-007751	Buttonwillow Tree and plaque (California Historical Landmark No. 492)
15-008251	Single-family residence on 2nd Street
15-008252	Single-family residence on Front Street
15-009736	Lithic scatter and habitation debris
15-009737	Remains of four structures at the Midway Steam Plant and a refuse scatter
15-009738	Cattle ranch complex and remains of a feed mill
15-013725*	East Side Canal
15-013726	Main Drain Canal
15-017682	Arizona Ditch
15-017683	Deep Wells Ditch
15-020012	Large but sparse scatter of lithic and other prehistoric artifacts

* Located partially in the APE

As Table 1 shows, five of the sites were of prehistoric—i.e., Native American—origin, as was the isolate. Nearest among these, Site 15-020012 was recorded during CRM TECH's 2019 survey in an area that has since been removed from the APE for this undertaking, a few hundred feet from the current APE boundaries. It consisted of a large but sparse scatter of flaked-stone and groundstone artifacts found on an artificial terrace. The other sites dated to the historic period and included four irrigation canals, a ranch complex, two buildings, the remains of the Midway Steam Plant with associated refuse items, and the Buttonwillow Tree, a California Historical Landmark.

One of the historic-period irrigation canals, the East Side Canal (Site 15-013725), is known to be located partially within the APE, specifically across the proposed pipeline alignment. First recorded in 2009 and subsequently updated at several different locations around Buttonwillow, Site 15-013725 is now delineated to encompass the entire length of the East Side Canal, an early irrigation work constructed around 1870 by the Miller and Lux Company to supply water to its Buttonwillow Ranch (Ruzicka et al. 2013).

Despite its early age and potential significance in the development of the surrounding area, past studies involving the site have typically found it to be ineligible for the National Register of Historic Places or the California Register of Historical Resources due to the loss of historic integrity in

relation to the period of origin (see App. 4). None of the other 14 known cultural resources were found in the immediate vicinity of the APE (see App. 3). Therefore, none of them require further consideration during this study.

HISTORICAL BACKGROUND RESEARCH

Historical sources consulted for this study demonstrate that the project vicinity has been in use for agriculture since the late 19th century, but few human-made features had appeared in the APE prior to the 1950s (Figs. 5-10; UCSB 1956; BCCA n.d.). Around 1910, the circa-1870 East Canal remained the only notable feature in the APE (Fig. 6). By the 1920s-1930s, a winding dirt road crossed the linear portion of the APE to the north of the canal, leading to a lone building nearby, probably a farmstead (Figs. 7, 8). During the next two decades, a power transmission line was built across the APE along the same route as present-day Path 15 (Fig. 9). Today, Path 15 consists of two 500-kV lines and a 230-kV line, the former built in the 1970s-1980s and the latter evidently reconstructed or upgraded after 2001 (Aspen Environmental Group 2001:ES-2).

In late May and early June of 1952, a major flood occurred in the Buttonwillow area and washed away much of the surface soils in the southern portion of the APE (Fig. 10; *Shafter Press and Shafter Progress* 1952). After that, artificial terraces were apparently built in that portion of the APE between 1956 and 1984 to create an even surface for agricultural fields that were subsequently established (UCSB 1956; 1967; NETR Online 1956; 1984). By 1967, the forerunner of the present-day WWTP was present in the southeastern portion of the APE, with a round water tank and a small structure in place, but most of the existing facilities at the plant, such as the biological treatment

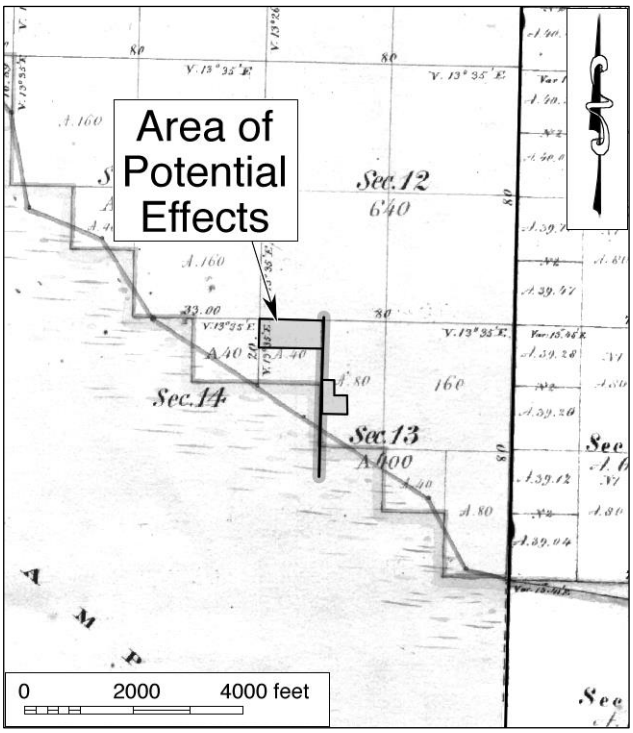

Figure 5. The APE and vicinity in 1852-1855. (Source: GLO 1856a; 1856b)

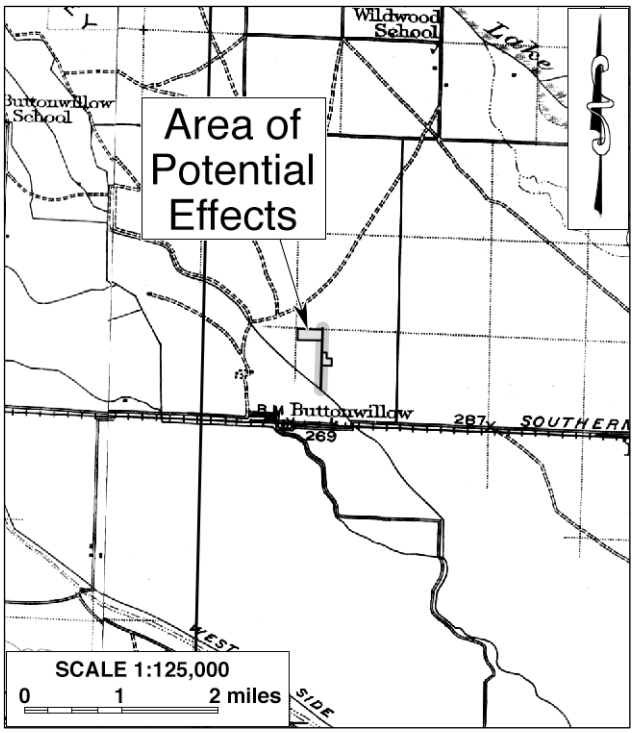

Figure 6. The APE and vicinity in 1907-1910. (Source: USGS 1912a; 1912b)

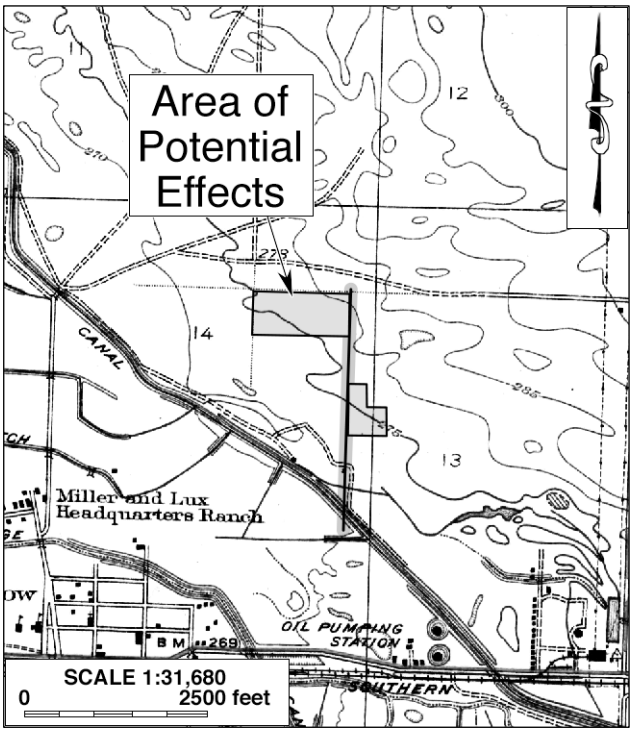

Figure 7. The APE and vicinity in 1928. (Source: USGS 1932)

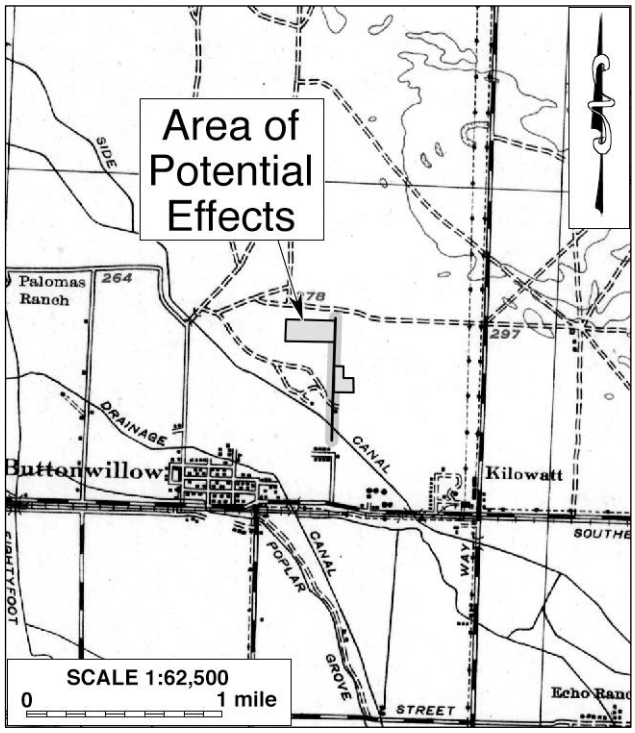

Figure 8. The APE and vicinity in 1937. (Source: USGS 1942)

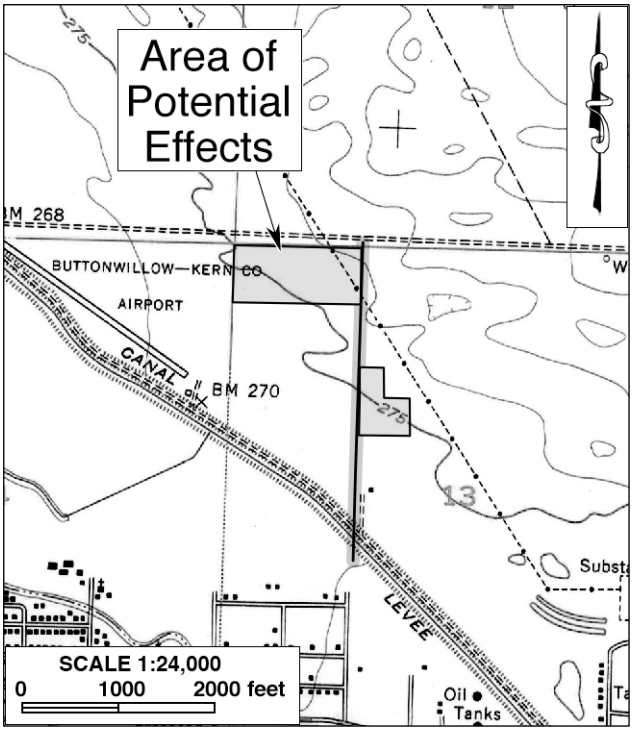

Figure 9. The APE and vicinity in 1952-1954. (Source: USGS 1954)

systems and the evaporation ponds, were constructed later in 2010 (NETR Online 1994-2010; Google Earth 1994-2011; Provost & Pritchard Consulting Group 2018:2-1). Since then, no notable changes in land use have been observed within the APE (NETR Online 2010-2016; Google Earth 2011-2018).

NATIVE AMERICAN PARTICIPATION

In response to CRM TECH's inquiry, the NAHC reported in a letter dated May 14, 2022, that the Sacred Lands File identified no Native American cultural resources within the APE but recommended that local Native American groups be contacted for further information. For that purpose, the NAHC provided a referral list of 11 individuals associated with six local Native American groups who may have knowledge of such resources (see App. 2). Upon receiving the NAHC's reply, CRM TECH sent written requests for comments to

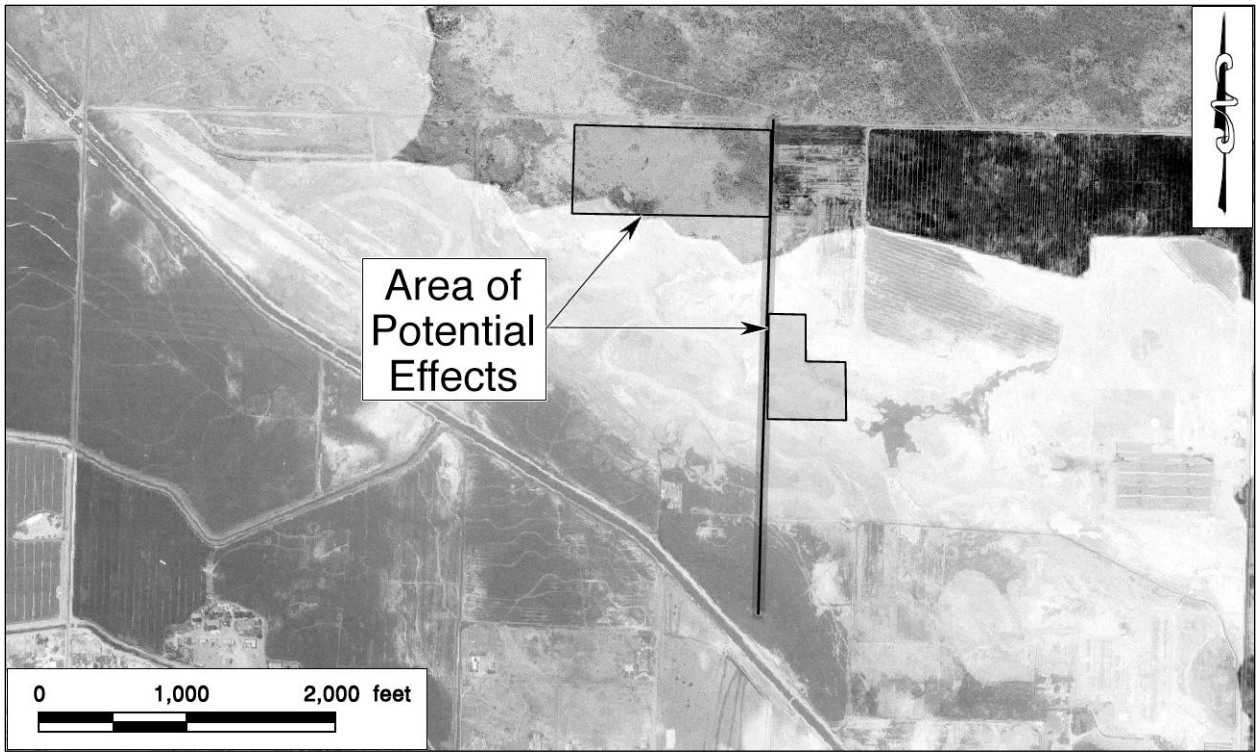

Figure 10. Aerial image of the APE from 1952. (Source: NETR Online 1952)

the designated spokespersons on cultural resources issues for all six tribal organizations on the referral list on May 18, 2022 (see App. 2). Follow-up telephone solicitations were carried out on June 1 and 15, 2022. The six tribal representatives contacted during this study are listed below:

- Danelle Gutierrez, Tribal Historic Preservation Officer, Big Pine Paiute Tribe of the Owens Valley
- Julio Quair, Chairperson, Chumash Council of Bakersfield
- Delia Dominguez, Chairperson, Kitanemuk and Yowlumne Tejon Indians
- Leo Sisco, Chairperson, Santa Rosa Rancheria Tachi Yokut Tribe
- Colin Rambo, Cultural Resource Management Technician, Tejon Indian Tribe
- Joey Garfield, Tribal Archaeologist, Tule River Indian Tribe.

As of this time, three of the tribes have responded to the inquiry (see App. 2). All three of them, namely the Big Pine Paiute Tribe, the Santa Rosa Rancheria, and the Tejon Indian Tribe, requested that Native American monitoring be implemented during ground-disturbing activities in the APE. In addition, the Big Pine Paiute Tribe requested further consultation with BCWD and SWRCB.

GEOARCHAEOLOGICAL ANALYSIS

Haydon and Hayhurst (2011) identified the surface sediments in and near the APE as *Qyl***,** namely late Pleistocene- to Holocene-aged lacustrine, playa, and estuarine deposits, which consist of fine-grained sand, silt, mud, and clay. Smith (1964) identified the soils in the APE as *Qb*, or recent basin deposits derived from flood stages of local streams between natural levees and fans. As an area of

active flooding and frequent inundation during the Holocene Epoch, the APE would not have been a favorable location for long-term habitation by the Native population in prehistoric times. The surrounding area would have been used for resource procurement, however, with its many seasonal streams and creeks.

This dynamic geological profile also leaves the general setting of the APE unconducive for the preservation of archaeological remains in the subsurface sediments. Most importantly, as mentioned above, the southern portion of the APE suffered major flood damages in 1952, and the current ground surface was partially rebuilt with imported soil after that. Consequently, the APE appears to be relatively low in sensitivity for buried deposits of intact, potentially significant archaeological remains of prehistoric or early historic origin.

FIELD SURVEY

During the field survey, five cultural resources were identified as lying within or partially within the APE. Among these is a segment of the East Side Canal (Site 15-013725), while four previously undocumented cultural resources were recorded and assigned temporary designations, pending assignment of official identification numbers in the California Historical Resources Inventory, including the existing WWTP and three isolates of prehistoric nature. These two sites and three isolates are discussed further below, with additional technical information presented in Appendix 4.

Aside from these five cultural resources, the only other notable features observed within or adjacent to the APE were the transmission lines comprising Path 15 and the unpaved extension of Meadow Street. Although a transmission line is known to have been present along the same route by 1954, all three existing lines are of modern origin (Aspen Environmental Group 2001:ES-2), and the field survey confirmed that the lattice towers standing in the APE are modern in appearance.

Meadow Street was present to the south of the APE at least by the 1920s-1930s era, but the segment along the proposed pipeline alignment dates only to the 1956-1967 era, after the flood of 1952 (Figs. 7-10; UCSB 1956; 1967). As a nondescript dirt road from the late historic period, it belongs to a type of features that are ubiquitous throughout rural areas in California and the U.S., which in themselves have little potential for historic significance. As such, the segment of Meadow Street in the APE requires no further consideration during this study.

Site 15-013725: East Side Canal

The current course of the East Canal crosses the linear portion of the APE near its southern end, where the canal measures approximately 45 feet in width at the top and 12 feet in depth, with an unlined flat bottom and gently sloping earthen side walls (Fig. 11), much as recorded elsewhere before (see App. 4). At the time of the field survey, the canal was dry with no running or standing water. The uniform configuration of the side walls demonstrates clear signs of relatively recent mechanical reshaping.

Site 3856-4H: Buttonwillow WWTP

Located partially in the southeastern portion of the APE, the BCWD's existing Buttonwillow WWTP consists of both historical and modern components. The historical components include an

Figure 11. The East Side Canal (Site 15-013725) at the crossing of the proposed pipeline alignment. (Photograph taken on May 5, 2022; view to the southeast)

Imhoff tank (Fig. 12), a corrugated metal shed, a storage pond, a sludge-drying bed, and a cluster of standpipes, all built between 1956 and 1967 (UCSB 1956; 1967). The modern components include a lift station, mechanical bar screen, two equalization tanks, two bio-tanks, two membrane tanks, two aerated sludge tanks, three concrete-lined sludge-drying beds, and two 22.5-acre-foot unlined storage ponds, which were added to the facility in 2010. As is typical for public utility establishments like this, all of the structures and other features at the plant are of standard design and utilitarian character. Due to the alterations and additions since 1967, the overall appearance of the facility is predominantly modern.

Isolates 3856-1, 3856-2, and 3856-3: Lithic Flakes

These prehistoric isolates were found at various locations throughout the APE, and each of them represents a single piece of worked stone. All three of them were found in extensively disturbed surface soils that may have been imported from elsewhere. Isolates 3856-1 and 3856-2, in particular, are located on an artificial terrace built sometime after the flood of 1952. As such, these localities appear to represent secondary deposits of artifacts from unknown origins that are now completely out of provenience. The archaeological data potential for these common artifacts, therefore, is very limited.

Figure 12. Imhoff tank and corrugated metal shed at Buttonwillow WWTP (Site 3856-4H). (Photograph taken on May 5, 2022; view to the northwest)

Isolate 3856-1 is a piece of mottled dark brown Monterey chert debitage with multiple flake scars and evidence of chipping or working along one edge. It measures 2.6 x 1.7 x 0.8 centimeters in size. Isolate 3856-2 is a piece of mottled orange-light brown chert debitage measuring 3.3 x 1.7 x 1.5 centimeters, with multiple flake scars on its surface. Isolate 3856-3 is a piece of mottled orange-light brown chert debitage measuring 4.2 x 2.6 x 1.8 centimeters, also with multiple flake scars on its surface.

MANAGEMENT CONSIDERATIONS

APPLICABLE STATUTORY AND REGULATORY FRAMEWORK

The purpose of this study is to identify and evaluate any "historic properties" or "historical resources" that may exist within or adjacent to the APE. "Historic properties," as defined by the Advisory Council on Historic Preservation, include "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior" (36 CFR 800.16(l)). The eligibility for inclusion in the National Register is determined by applying the following criteria, developed by the National Park Service as per provision of the National Historic Preservation Act:

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and

(a) that are associated with events that have made a significant contribution to the broad patterns of our history; or
(b) that are associated with the lives of persons significant in our past; or
(c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
(d) that have yielded, or may be likely to yield, information important in prehistory or history. (36 CFR 60.4)

For CEQA-compliance considerations, the State of California's Public Resources Code (PRC) establishes the definitions and criteria for "historical resources," which require similar protection to what NHPA Section 106 mandates for "historic properties." "Historical resources," according to PRC §5020.1(j), "includes, but is not limited to, any object, building, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California."

More specifically, CEQA guidelines state that the term "historical resources" applies to any such resources listed in or determined to be eligible for listing in the California Register of Historical Resources, included in a local register of historical resources, or determined to be historically significant by the lead agency (Title 14 CCR §15064.5(a)(1)-(3)). Regarding the proper criteria of historical significance, CEQA guidelines mandate that "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" (Title 14 CCR §15064.5(a)(3)). A resource may be listed in the California Register if it meets any 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 construction, or represents the work of an important creative individual, or possesses high artistic values.
(4) Has yielded, or may be likely to yield, information important in prehistory or history. (PRC §5024.1(c))

RESOURCE EVALUATION

Site 15-013725: East Side Canal

As noted above, the East Side Canal has been evaluated for potential eligibility in the National Register of Historic Places or the California Register of Historical Resources in past studies and found not to be eligible (see App. 4). While the builder of the canal, the Miller and Lux Company, is well remembered today as one of the most important agricultural enterprises in early Californian history, and while the development of irrigation works was arguably a highly significant pattern of

events in the growth of the arid southwestern region of the U.S., the previous studies involving Site 15-013725 have typically concluded that "constant realignment, reshaping, and replacement of control structures has compromised the integrity of the segments surveyed" (Ruzicka et al. 2013:2).

The small segment of the East Side Canal lying across the APE similarly suffers from compromised historic integrity in relation to its period of origin, namely the 1870s era. With its mechanically reshaped side walls and bottom, the canal at this location is essentially modern in appearance and lacks the sense of history and originality in terms of design, workmanship, and feeling. As a result, it no longer conveys a strong and close association with the history of the Miller and Lux Company and of the development of irrigation during the late 19th century. Therefore, the present study concurs with the previous evaluation that Site 15-013725 does not appear eligible for the National Register or the California Register, at least with regards to the segment in question. As such, it does not meet the definition of a "historic property" or a "historical resource."

Site 3856-4H: Buttonwillow WWTP

The historical components of the Buttonwillow WWTP date to the 1950s-1960s era, but the current character of the facility is dominated by the results of substantial expansion and upgrading completed in 2010, as discussed above. Like the segment of the East Side Canal in the APE, the WWTP lacks sufficient historic integrity to relate to its period of origin. Furthermore, historical background research during this study has uncovered no evidence that the facility is closely associated with any persons or events of recognized historic significance.

As one of the numerous late-historic-period public utility works of standard design and configuration that remain in service throughout the U.S., the Buttonwillow WWTP does not exhibit any remarkable qualities in engineering, technology, architecture, or aesthetics, nor is it known to represent an important example of any property type, period, region, and method of construction. In addition, the plant holds little promise for important historical or archaeological data for the study of public utility works in the post-WWII era, a subject that is well documented in existing literature.

In summary, Site 3856-4H does not appear to meet any of the criteria for listing in the National Register of Historic Places or the California Register of Historical Resources, nor does it retain sufficient historic integrity for such listing. Therefore, it does not qualify as a "historic property" or a "historical resource" under Section and CEQA provisions.

Isolates 3856-1, 3856-2, and 3856-3: Lithic Flakes

The three prehistoric isolates discovered during this study each consist of an individual lithic flake. Based on the locations and context of the isolates, the artifacts appear to represent the results of secondary deposition with imported soils and therefore retain no integrity of provenience. In any event, such isolates, or localities with fewer than three artifacts, by definition do not qualify as archaeological sites due to the lack of contextual integrity. As such, Isolates 3856-1, 3856-2, and 3856-3 do not constitute potential "historic properties"/"historical resources" and require no further consideration in the Section 106- and CEQA-compliance process.

CONCLUSION AND RECOMMENDATIONS

Section 106 of the National Historic Preservation Act mandates that federal agencies take into account the effects of their undertakings on historic properties and seek ways to avoid, minimize, or mitigate any adverse effects on such properties (36 CFR 800.1(a)). Similarly, CEQA establishes that a project that may cause a substantial adverse change in the significance of a "historical resource" is a project that may have a significant effect on the environment (PRC §21084.1-2). "Substantial adverse change," according to PRC §5020.1(q), "means demolition, destruction, relocation, or alteration such that the significance of an historical resource would be impaired."

As stated above, five cultural resources, including two historic-period sites and three prehistoric isolates, were encountered within or partially within the APE during this study, but none of them meet the definition of a "historic property" or a "historical resource" under Section 106 and CEQA provisions. The geoarchaeological analysis, meanwhile, suggests that the highly dynamic and extensively disturbed subsurface sediments in the APE are relatively low in archaeological sensitivity. Based on these findings, CRM TECH presents the following recommendations to BCWD and SWRCB:

- No "historic properties" or "historical resources" are present within or adjacent to the APE, and thus no "historic properties" or "historical resources" will be affected by the proposed undertaking.
- No further cultural resources investigation will be necessary for the undertaking unless project plans undergo such changes as to include areas not covered by this study.
- If buried cultural materials are discovered during earth-moving operations associated with the undertaking, all work in the immediate area should be halted or diverted until a qualified archaeologist can evaluate the nature and significance of the find.

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APPENDIX 1
PERSONNEL QUALIFICATIONS

PRINCIPAL INVESTIGATOR/HISTORIAN
Bai "Tom" Tang, M.A.

Education

1988-1993	Graduate Program in Public History/Historic Preservation, University of California, Riverside.
1987	M.A., American History, Yale University, New Haven, Connecticut.
1982	B.A., History, Northwestern University, Xi'an, China.
2000	"Introduction to Section 106 Review," presented by the Advisory Council on Historic Preservation and the University of Nevada, Reno.
1994	"Assessing the Significance of Historic Archaeological Sites," presented by the Historic Preservation Program, University of Nevada, Reno.

Professional Experience

2002-	Principal Investigator, CRM TECH, Riverside/Colton, California.
1993-2002	Project Historian/Architectural Historian, CRM TECH, Riverside, California.
1993-1997	Project Historian, Greenwood and Associates, Pacific Palisades, California.
1991-1993	Project Historian, Archaeological Research Unit, University of California, Riverside.
1990	Intern Researcher, California State Office of Historic Preservation, Sacramento.
1990-1992	Teaching Assistant, History of Modern World, University of California, Riverside.
1988-1993	Research Assistant, American Social History, University of California, Riverside.
1985-1988	Research Assistant, Modern Chinese History, Yale University.
1985-1986	Teaching Assistant, Modern Chinese History, Yale University.
1982-1985	Lecturer, History, Xi'an Foreign Languages Institute, Xi'an, China.

Cultural Resources Management Reports

Preliminary Analyses and Recommendations Regarding California's Cultural Resources Inventory System (with Special Reference to Condition 14 of NPS 1990 Program Review Report). California State Office of Historic Preservation working paper, Sacramento, September 1990.

Numerous cultural resources management reports with the Archaeological Research Unit, Greenwood and Associates, and CRM TECH, since October 1991.

PRINCIPAL INVESTIGATOR/ARCHAEOLOGIST
Michael Hogan, Ph.D., RPA (Registered Professional Archaeologist)

Education

1991	Ph.D., Anthropology, University of California, Riverside.
1981	B.S., Anthropology, University of California, Riverside; with honors.
1980-1981	Education Abroad Program, Lima, Peru.
2002	"Section 106—National Historic Preservation Act: Federal Law at the Local Level," UCLA Extension Course #888.
2002	"Recognizing Historic Artifacts," workshop presented by Richard Norwood, Historical Archaeologist.
2002	"Wending Your Way through the Regulatory Maze," symposium presented by the Association of Environmental Professionals.
1992	"Southern California Ceramics Workshop," presented by Jerry Schaefer.
1992	"Historic Artifact Workshop," presented by Anne Duffield-Stoll.

Professional Experience

2002-	Principal Investigator, CRM TECH, Riverside/Colton, California.
1999-2002	Project Archaeologist/Field Director, CRM TECH, Riverside, California.
1996-1998	Project Director and Ethnographer, Statistical Research, Inc., Redlands, California.
1992-1998	Assistant Research Anthropologist, University of California, Riverside.
1992-1995	Project Director, Archaeological Research Unit, U.C. Riverside.
1993-1994	Adjunct Professor, Riverside Community College, Mt. San Jacinto College, U.C. Riverside, Chapman University, and San Bernardino Valley College.
1991-1992	Crew Chief, Archaeological Research Unit, U.C. Riverside.
1984-1998	Project Director, Field Director, Crew Chief, and Archaeological Technician for various southern California cultural resources management firms.

Research Interests

Cultural Resource Management, Southern Californian Archaeology, Settlement and Exchange Patterns, Specialization and Stratification, Culture Change, Native American Culture, Cultural Diversity.

Cultural Resources Management Reports

Principal investigator for, author or co-author of, and contributor to numerous cultural resources management study reports since 1986.

Memberships

Society for American Archaeology; Society for California Archaeology; Pacific Coast Archaeological Society; Coachella Valley Archaeological Society.

PROJECT ARCHAEOLOGIST/REPORT WRITER
Deirdre Encarnación, M.A.

Education

2003	M.A., Anthropology, San Diego State University, California.
2000	B.A., Anthropology, minor in Biology, San Diego State University, California; with honors.
2021	Certificate of Specialization, Kumeyaay Studies, Cuyamaca College, California.
2001	Archaeological Field School, San Diego State University.
2000	Archaeological Field School, San Diego State University.

Professional Experience

2004-	Project Archaeologist/Report Writer, CRM TECH, Riverside/Colton, California.
2001-2003	Part-time Lecturer, San Diego State University, California.
2001	Research Assistant for Dr. Lynn Gamble, San Diego State University.
2001	Archaeological Collection Catalog, SDSU Foundation.

Memberships

Society for California Archaeology; Society for Hawaiian Archaeology; California Native Plant Society.

PROJECT ARCHAEOLOGIST
Hunter C. O'Donnell, B.A.

Education

2016-	M.A. Program, Applied Archaeology, California State University, San Bernardino.
2015	B.A. (*cum laude*), Anthropology, California State University, San Bernardino.
2012	A.A., Social and Behavioral Sciences, Mt. San Antonio College, Walnut, California.
2011	A.A., Natural Sciences and Mathematics, Mt. San Antonio College, Walnut, California.
2014	Archaeological Field School, Santa Rosa Mountains; supervised by Bill Sapp of the United States Forest Service and Daniel McCarthy of the San Manuel Band of Mission Indians.

Professional Experience

2017-	Project Archaeologist, CRM TECH, Colton, California.
2016-2018	Graduate Research Assistant, Applied Archaeology, California State University, San Bernardino.
2016-2017	Cultural Intern, Cultural Department, Pechanga Band of Luiseño Indians, Temecula, California.
2015	Archaeological Intern, U.S. Bureau of Land Management, Barstow, California.
2015	Peer Research Consultant: African Archaeology, California State University, San Bernardino.

APPENDIX 2

CORRESPONDENCE WITH NATIVE AMERICAN REPRESENTATIVES*

* Six local Native American representatives were contacted during this study; a sample letter is included in the appendix.

SACRED LANDS FILE & NATIVE AMERICAN CONTACTS LIST REQUEST

NATIVE AMERICAN HERITAGE COMMISSION

1550 Harbor Boulevard, Suite 100
West Sacramento, CA 95691
(916)373-3710
(916)373-5471 (Fax)
nahc@nahc.ca.gov

Project: Proposed Buttonwillow II Improvements Project (CRM TECH No. 3856)

County: Kern

USGS Quadrangle Name: Buttonwillow, Calif.

Township 29 South **Range** 23 East MD **BM; Section(s)** 13

Company/Firm/Agency: CRM TECH

Contact Person: Nina Gallardo

Street Address: 1016 E. Cooley Drive, Suite A/B

City: Colton, CA **Zip:** 92324

Phone: (909) 824-6400 **Fax:** (909) 824-6405

Email: ngallardo@crmtech.us

Project Description: The primary component of the project is to make improvements to an existing wastewater treatment plant on approximately 16.7 acres of land and 0.6 mile of pipeline alignment located south of Sullivan Road and west of Wasco Way, near the unincorporated community of Buttonwillow, Kern County, California.

March 9, 2022

NATIVE AMERICAN HERITAGE COMMISSION

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710

May 14, 2022

Nina Gallardo
CRM TECH

Via Email to: ngallardo@crmtech.us

Re: Proposed Buttonwillow II Improvements Project, Kern County

Dear Ms. Gallardo:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information you have submitted for the above referenced project. The results were negative. However, the absence of specific site information in the SLF does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated; if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance, we can assure that our lists contain current information.

If you have any questions or need additional information, please contact me at my email address: Cameron.Vela@nahc.ca.gov.

Sincerely,

Cameron Vela

Cameron Vela
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Native American Contact List
Kern County
5/14/2022

Big Pine Paiute Tribe of the Owens Valley
Danelle Gutierrez, Tribal Historic Preservation Officer
P.O. Box 700
Big Pine, CA, 93513
Phone: (760) 938 - 2003
Fax: (760) 938-2942
d.gutierrez@bigpinepaiute.org
Paiute-Shoshone

Big Pine Paiute Tribe of the Owens Valley
James Rambeau, Chairperson
P. O. Box 700
Big Pine, CA, 93513
Phone: (760) 938 - 2003
Fax: (760) 938-2942
j.rambeau@bigpinepaiute.org
Paiute-Shoshone

Big Pine Paiute Tribe of Owens Valley
Sally Manning, Environmental Director
P. O. Box 700
Big Pine, CA, 93513
Phone: (760) 938 - 2003
s.manning@bigpinepaiute.org
Paiute-Shoshone

Chumash Council of Bakersfield
Julio Quair, Chairperson
729 Texas Street
Bakersfield, CA, 93307
Phone: (661) 322 - 0121
chumashtribe@sbcglobal.net
Chumash

Kitanemuk & Yowlumne Tejon Indians
Delia Dominguez, Chairperson
115 Radio Street
Bakersfield, CA, 93305
Phone: (626) 339 - 6785
2deedominguez@gmail.com
Kitanemuk
Southern Valley
Yokut

Santa Rosa Rancheria Tachi Yokut Tribe
Leo Sisco, Chairperson
P.O. Box 8
Lemoore, CA, 93245
Phone: (559) 924 - 1278
Fax: (559) 924-3583
Southern Valley
Yokut

Tejon Indian Tribe
Octavio Escobedo, Chairperson
P.O. Box 640
Arvin, CA, 93203
Phone: (661) 834 - 8566
oescobedo@tejonindiantribe-nsn.gov
Kitanemuk

Tejon Indian Tribe
Colin Rambo,
P.O. Box 640
Arvin, CA, 93203
Phone: (661) 834 - 8566
colin.rambo@tejonindiantribe-nsn.gov
Kitanemuk

Tule River Indian Tribe
Neil Peyron, Chairperson
P.O. Box 589
Porterville, CA, 93258
Phone: (559) 781 - 4271
Fax: (559) 781-4610
neil.peyron@tulerivertribe-nsn.gov
Yokut

Tule River Indian Tribe
Joey Garfield, Tribal Archaeologist
P. O. Box 589
Porterville, CA, 93258
Phone: (559) 783 - 8892
Fax: (559) 783-8932
joey.garfield@tulerivertribe-nsn.gov
Yokut

Tule River Indian Tribe
Kerri Vera, Environmental Department
P. O. Box 589
Porterville, CA, 93258
Phone: (559) 783 - 8892
Fax: (559) 783-8932
kerri.vera@tulerivertribe-nsn.gov
Yokut

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Proposed Buttonwillow II Improvements Project, Kern County.

May 18, 2022

RE: Buttonwillow County Water District Wastewater Treatment Plant Improvements Project
Approximately 24.5 Acres near the Community of Buttonwillow
Kern County, California
CRM TECH Contract #3856

Dear Tribal Representative:

I am writing to bring your attention to an ongoing CEQA-Plus study for the proposed project referenced above, which entails improvements to the existing Buttonwillow County Water District wastewater treatment plant (BCWD) near the unincorporated community of Buttonwillow. The Area of Potential Effects (APE) for the undertaking includes the existing BCWD wastewater treatment plant and an adjacent 24.5 acres of agricultural land, located south of Sullivan Road and west of Wasco Way. The accompanying map, based on the USGS Buttonwillow, Calif., 7.5' quadrangle, depict the APE in Section 13, T29S R23E, MDBM.

In 2019, the APE was included as part of a larger cultural resource study completed by CRM TECH, in which a previously unknown archaeological site of prehistoric origin was found just south of the current APE and was subsequently designated Site 15-020012 (CA-KER-010921) in the California Historical Resources Inventory. The site consists of a sparse surface scatter of flaked-stone and groundstone artifacts. More recently, the Native American Heritage Commission reports in a letter dated May 14, 2022, that the results of the Sacred Lands File search were negative but recommends contacting local Native American groups for further information (see attached). As a part of the cultural resources study for this project, I am writing to request your input on potential Native American cultural resources in or near the APE.

Please respond at your earliest convenience if you have any specific knowledge of sacred/religious sites or other sites of Native American traditional cultural value in or near the APE, or any other information to consider during the cultural resources investigations. Any information or concerns may be forwarded to CRM TECH by telephone, e-mail, facsimile, or standard mail. Requests for documentation or information we cannot provide will be forwarded to our client and/or the lead agency, namely the State Water Resources Control Board.

We would also like to clarify that, as the cultural resources consultant for the project, CRM TECH is not involved in the AB 52-compliance process or in government-to-government consultations. The purpose of this letter is to seek any information that you may have to help us determine if there are cultural resources in or near the project area that we should be aware of and to help us assess the sensitivity of the APE. Thank you for your time and effort in addressing this important matter.

Respectfully,

Nina Gallardo
Project Archaeologist/Native American liaison
CRM TECH

Encl.: NAHC response letter and project location map

From: Paige Berggren <pberggren@tachi-yokut-nsn.gov>
Sent: Friday, May 27, 2022 10:16 AM
To: ngallardo@crmtech.us
Cc: Shana Powers; Samantha McCarty
Subject: Buttonwillow County Water District Wastewater Treatment Plant Improvements Project

Dear Ms. Gallardo,

Thank you for contacting the Santa Rosa Rancheria Tachi-Yokut Tribe regarding the Buttonwillow County Water District Wastewater Treatment Plant Improvements Project. The Tribe is requesting the site record for CA-KER-010921, with supporting map location information, in the form of Lat/Longs, KMZs, PDF maps, or Township/Range/Section with description. We also request that the lead agency retain Native American Tribal Monitors from either ourselves (Santa Rosa) or Tejon Indian Tribe to monitor any ground disturbing activity related to the project. If you have any questions please contact myself, Shana Powers, or Samantha McCarty, both of which are cc'd on this email. Thank you.

Respectfully,
Paige Berggren (she/her/hers)
Santa Rosa Rancheria Tachi-Yokut Tribe
Cultural Specialist Monitor l
PBerggren@tachi-yokut-nsn.gov
Office: (559) 924-1278 x 4092

From: Colin Rambo <colin.rambo@tejonindiantribe-nsn.gov>
Sent: Thursday, June 16, 2022 4:59 PM
To: ngallardo@crmtech.us
Subject: RE: NA Scoping Letter for the Proposed Buttonwillow County Water District Wastewater Treatment Plant Improvements Project near the Community of Buttonwillow, Kern County (CRM TECH # 3856)

Hi Nina,

The Tejon Tribe is not currently aware of any extant Tribal Cultural Resources being specifically located within the Project Area. That said, we are aware of extant ancestral burial grounds being present in the immediate vicinity to the southeast of the project. Consequently, we consider the Project Area to be highly culturally sensitive, and respectfully request that CRM Tech consider using a Tribal Monitor (trained to the level of an archaeological field technician) on any surveys or excavations associated with the project as well as including construction monitoring as a mitigation measure for project implementation.

Please feel free to contact me with any questions.

Thanks,

Colin Rambo, M.A.I.S.
Cultural Resource Management Technician
Tejon Indian Tribe
Physical (FedEx & UPS): 4941 David Road, Bakersfield, CA 93307
Mailing (USPS): P.O. Box 640, Arvin, CA 93203
Office: 661.834.8566 | Mobile: 484.515.4790
colin.rambo@tejonindiantribe-nsn.gov

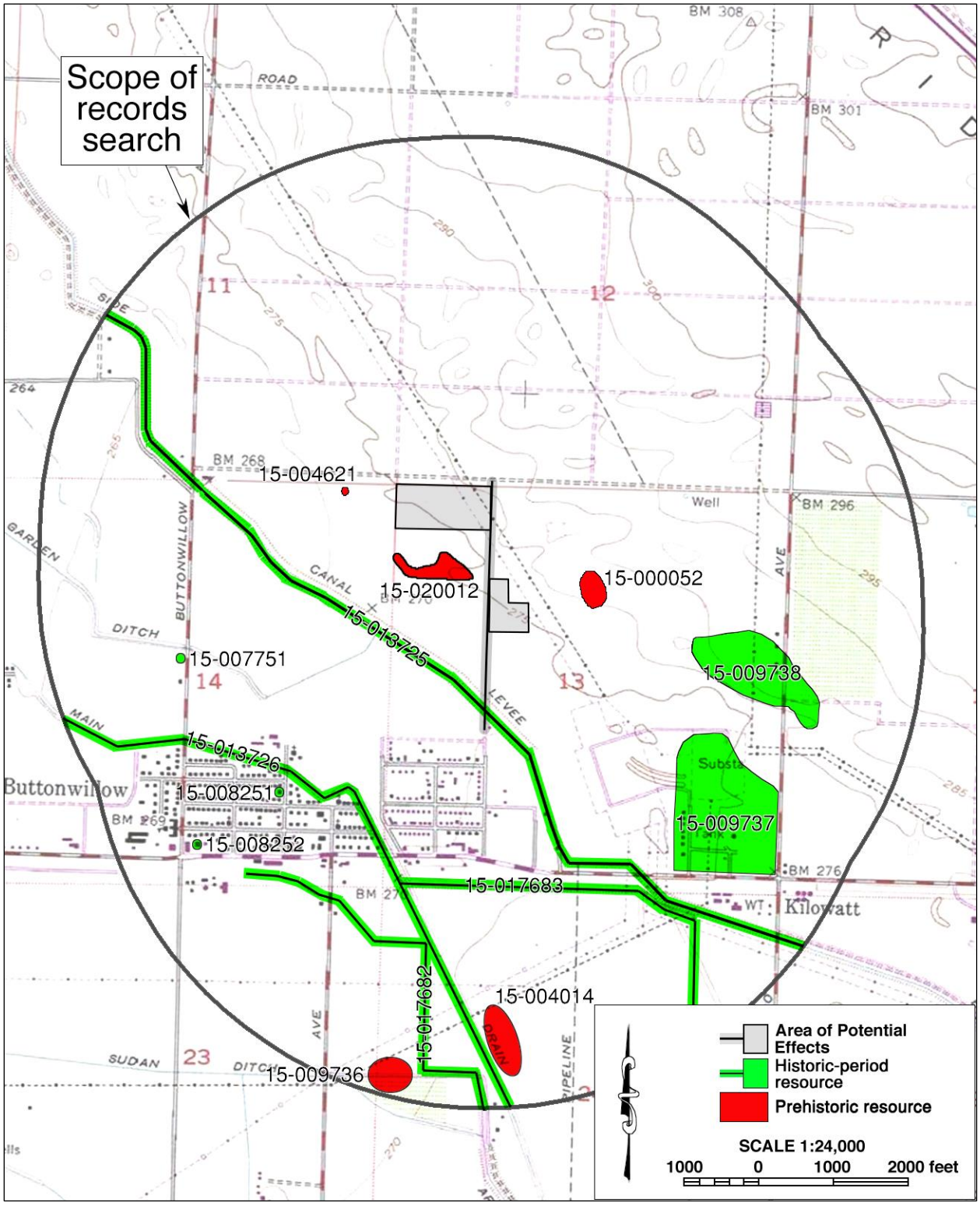
TELEPHONE LOG

Name	Tribe/Affiliation	Telephone Contacts	Note
Danelle Gutierrez, Tribal Historic Preservation Officer	Big Pine Paiute Tribe of the Owens Valley	3:26 pm, June 1, 2022	The Tribe requests monitoring during ground-disturbing activities due to sensitivity of the area and proximity of previously recorded site. The Tribe also seeks further consultation with BCWD and SWRCB.
Julio Quair, Chairperson	Chumash Council of Bakersfield	3:47 pm, June 1, 2022; 8:55 am, June 15, 2022	No voicemail available; no response to date.
Delia Dominguez, Chairperson	Kitanemuk & Yowlumne Tejon Indians	3:52 pm, June 1, 2022; 8:57 am, June 15, 2022	Left voice messages; no response to date.
Leo Sisco, Chairperson	Santa Rosa Rancheria Tachi-Yokut Tribe	None	Paige Berggren, Cultural Specialist Monitor, responded by e-mail on May 27, 2022 (copy attached).
Colin Rambo, M.A.I.S., Cultural Resource Management Technician	Tejon Indian Tribe	3:55 pm, June 1, 2022; 9:06 am, June 15, 2022	Mr. Rambo responded by e-mail on June 16, 2022 (copy attached).
Joey Garfield, Tribal Archaeologist	Tule River Indian Tribe	3:59 pm, June 1, 2022; 9:04 am, June 15, 2022	Left voice messages; no response to date.

APPENDIX 3

LOCATIONS OF PREVIOUSLY RECORDED CULTURAL RESOURCES IN THE SCOPE OF THE RECORDS SEARCH

(Confidential)


Scope of records search
15-004621
15-020012
15-000052
15-009738
15-007751
15-013725
15-013726
15-008251
15-008252
15-009737
15-017683
15-017682
15-004014
15-009736
Buttonwillow
Kilowatt
Area of Potential Effects
Historic-period resource
Prehistoric resource
SCALE 1:24,000
1000 0 1000 2000 feet

APPENDIX 4

CULTURAL RESOURCES IDENTIFIED IN THE APE

(Confidential)

Recorded by Hunter O'Donnell Date May 5, 2022 ___Continuation √ Update
Affiliation: CRM TECH, Colton Project No: 3856

Site 15-013725 was originally recorded in April 2009, with several segments added during updates in July 2009 and January 2013. The site represents the East Side Canal, an unlined, flat-bottom ditch through rural Kern County, primarily near the community of Buttonwillow. During an intensive-level field survey on May 5, 2022, a roughly 50-foot-long segment of the canal was revisited at its intersection with Meadow Street, where the canal measures approximately 45 feet in width at the top and 12 feet in depth, much as recorded elsewhere before. At the time, the canal was dry with no running or standing water in it.

The side walls and bottom have been mechanically reshaped and the canal at this location is essentially modern in appearance, lacking a sense of history and originality in terms of design, workmanship, and feeling. Previous studies involving Site 15-013725 have typically concluded that "constant realignment, reshaping, and replacement of control structures has compromised the integrity of the segments surveyed" (see 2013 update). The present study concurs with the previous evaluation that Site 15-013725 does not appear eligible for the National Register of Historic Places or the California Register of Historical Resources.

Report Citation:

Bai "Tom" Tang, Deirdre Encarnación, and Hunter O'Donnell
2022 Identification and Evaluation of Historic Properties: Buttonwillow County Water District Wastewater Treatment Plant Improvements Project, near the Community of Buttonwillow, Kern County, California

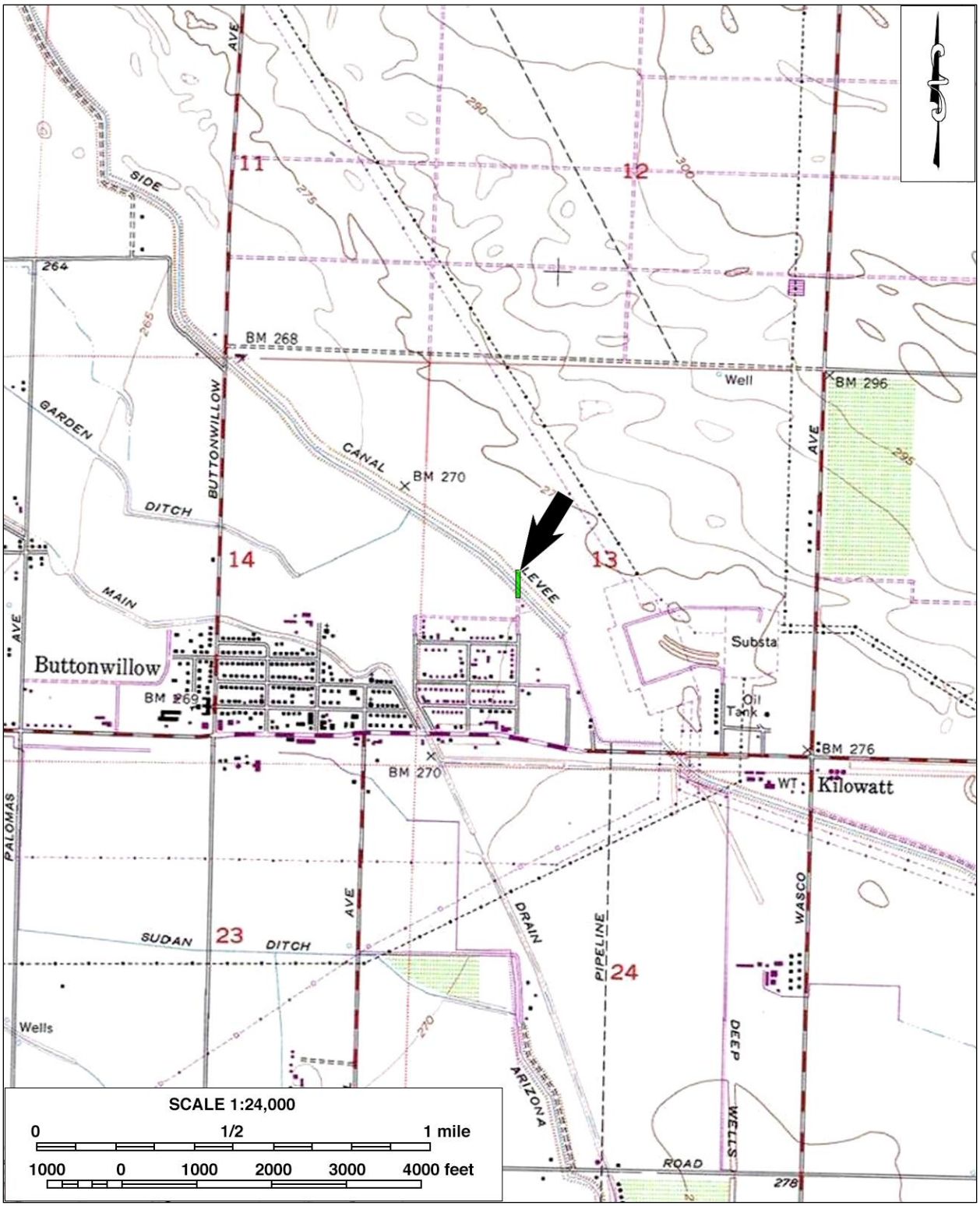
State of California--The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary # 15-013725 (update)
HRI #
Trinomial CA-KER-7701H (update)

Page 2 **of** 2 ***Resource Name or #** (Assigned by recorder)

***Map Name:** Buttonwillow, Calif. ***Scale:** 1:24,000 ***Date of Map:** 1954/1973



UPDATE

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # P15-13725
HRI #
Trinomial CA-KER-07701H
NRHP Status Code

Other Listings
Review Code Reviewer Date

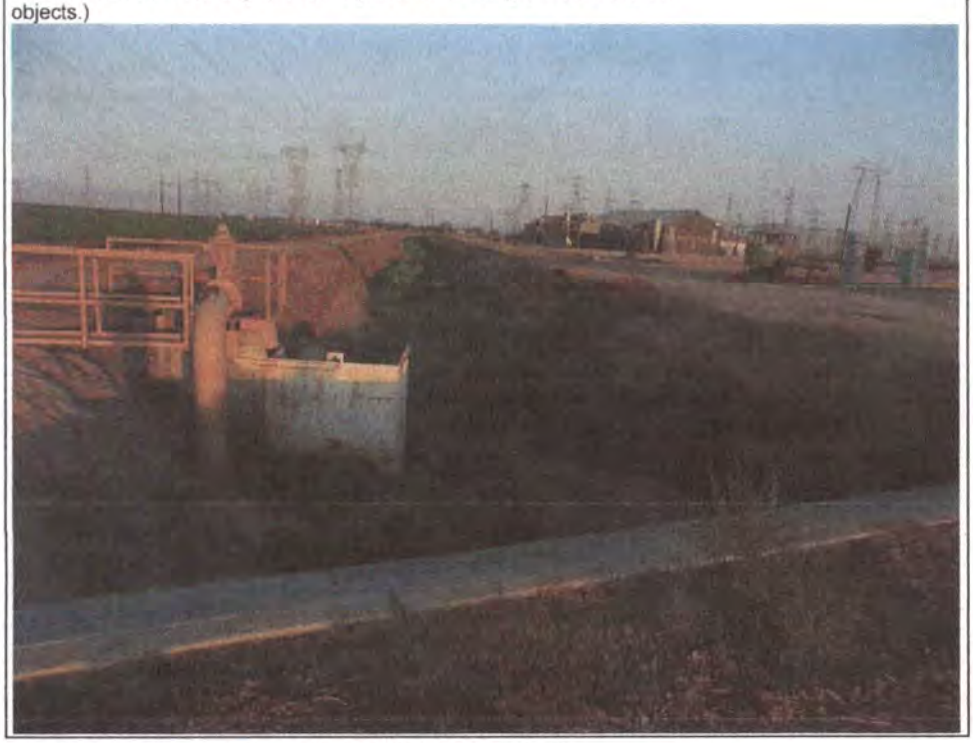
Page 1 of 2 *Resource Name or #: East Side Canal: Update

P1. Other Identifier:
*P2. Location: ☐ Not for Publication ☐ Unrestricted *a. County: Kern
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
*b. USGS 7.5' Quad: Buttonwillow Date: 1954/73 T 29S; R 23E; NE ¼ of NE ¼ of Sec 24; T 29S; R24E; NW ¼ of NW ¼ of Sec 19; MD B.M.
c. Address: City: Zip:
d. UTM: Zone: 11 ; 277800 mE/ 3919630 mN (NAD 27)
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate) Elevation: 275 ft AMSL
From north bound Interstate 5 follow State Route 58 west approximately three miles to Wasco Avenue and turn left (south). Follow Wasco Avenue south approximately 0.1 mile to the East Side Canal crossing.

*P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
An historical irrigation canal. The East Side Canal was originally recorded by Melvin and Flores (2009) and described as originally constructed ca. 1870 by the Miller and Lux Company as the primary irrigation canal for their Buttonwillow Ranch. The segment of the canal herein recorded consists of an earthen "V" shaped, flat bottomed, ditch measuring approximately 45 feet in width at the top and 12 feet in depth, crossing Wasco Avenue by means of a concrete encased undercrossing consisting of three parallel culverts. The ditch continues to the east and west from this point and is apparent on the Buttonwillow 7.5' topographic depictions of the area dated 1932 and 1954.

*P3b. Resource Attributes: (List attributes and codes) HP 20 Canal/Aqueduct; AH6 Water Conveyance System
*P4. Resources Present: ☐Building ☒ Structure ☐Object ☐Site ☐District ☐Element of District ☐Other (Isolates, etc.)

P5a. Photo or Drawing (Photo required for buildings, structures, and objects.)



P5b. Description of Photo: (View, date, accession #) East Side Canal overview to west

*P6. Date Constructed/Age and Sources: ☒Historic
☐Prehistoric ☐Both

*P7. Owner and Address:
Unknown.

*P8. Recorded by: (Name, affiliation, and address)
June A. Schmidt and James J. Schmidt
Compass Rose Archaeological, Inc.
18960 Nordhoff Street, Northridge, CA 91324

*P9. Date Recorded: 09/15/13

*P10. Survey Type: (Describe)
Roadside pedestrian

*P11. Report Citation: (Cite survey report and other sources, or enter "none.") Melvin, Steven J., and Rebecca Flores, 2009: Primary Record for P15-13725 (CA-KER-07701H).
Romani, Gwen & James Schmidt *Archaeological Survey Report: Improvements to Elk Hills Road, Skyline Road to State Route 58 (approximately 10.2-miles), Kern County, California*. Submitted to Kern County Roads Department. KE-04512

*Attachments: ☐None ☒Location Map ☐Sketch Map ☐Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

DPR 523A (1/95) *Required information

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # P-15-013725
HRI #
Trinomial CA-KER-7701H
NRHP Status Code

Other Listings
Review Code | Reviewer | Date

Page 1 of 11 *Resource Name or #: Segments of the East Side Canal from Semitropic Canal to South of Canal 8, from Lerdo Highway to Milan Road, and from north of Perral Road to Canal 17

P1. Other Identifier: East Side Canal

*P2. Location: ☑ Not for Publication ☐ Unrestricted *a. County: Kern

*b. USGS 7.5' Quad: Lokern; Semitropic Date: 1973 Mount Diablo B.M. Overall (Surveyed underlined):
T 27S; R 22E: Sec 13, 14, 23, 22, 21, 28, 33, 34; T 28S; R 22E ; Sec 2, 3, 11, 14, 13, 24; T 28S; R 23E ; Sec 19, 30, 31, 32

c. Address: City: Zip: 93206

d. UTM: Zone: 11 all NAD 83; UTMs of areas surveyed:
N end of northern segment surveyed: 264210 mE/ 3937918mN; South end of northern segment surveyed: 266692 mE/3932675 mN
N end of northern middle sgmnt. surveyed: 267188 mE/ 3931480mN; South end middle sgmnt surveyed: 267388 mE/3931280 mN
N end of southern middle sgmnt. surveyed: 268896 mE/ 3928468mN; South end sthrn sgmnt surveyed: 269306 mE/3927570 mN
Check dam in Photo 1030010 = 266213 mE/ 3933093mN; Crossing at Semitropic Canal 264216 mE/ 3937918mN;
Lerdo Highway 267188 mE/ 3931480mN
Other Check dams: 268909 mE/3928420 mN; 269027 mE/3928207 mN; 269284 mE/3927590 mN; 264135 mE/3937584 mN; 264308 mE/3935588 mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)
Off Lerdo Highway, also at I-5, north of Buttonwillow, south of Lost Hills
Elevation: 240-248, 256 feet

*P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
The East Side Canal is an approximately 40-foot-wide dredged canal that forms/marks the eastern boundary of the Buena Vista Water Storage District (BVWSD) in western Kern County. It was originally constructed by the Kern Valley Water Company before the 1890s. The segments surveyed include a portion south of Lerdo Highway that runs from north of Perral Road to Canal 17, a short portion running from Lerdo Highway south to Milan Road, and a long portion that lies north of Lerdo Highway that runs from just south of Cord Road to the East Side Canal's crossing with the Semitropic Canal. On either side of the canal is an approximately 30-foot wide built-up levee that also serves as a road. The canal reaches a depth of 10-15 feet below these levees. Three check dams/"bridges" were present in the canal in the surveyed portions.

*P3b. Resource Attributes: (HP20) Canal/aqueduct

*P4. Resources Present: ☐Building ☑Structure ☑Object ☐Site ☐District ☐Element of District ☐Other (Isolates, etc.)

P5a. Photo or Drawing (Photo required for buildings, structures, and objects.)

P5b. Description of Photo: P1030010, facing Northwest, 1/7/2013
☆ on Sketch map is approx. location of photograph

*P6. Date Constructed/Age and Sources: ☑Historic
☐Prehistoric ☐Both
1876-1950s: alterations and improvements to date

*P7. Owner and Address:
Buena Vista Water Storage District
525 North Main Street
Buttonwillow, CA 93206
Also Various Parcel oweners

*P8. Recorded by:
Denise Ruzicka, Linda Akyüz, Teejay Casado, Paul Shattuck
ArchaeoPaleo Resource Management, Inc.
1531 Pontius Ave, Suite 200
Los Angeles, CA 90025

*P9. Date Recorded: 7-11 January 2013

*P10. Survey Type: Pedestrian

*P11. Report Citation: Akyüz, Linda and Denise Ruzicka. 2013. *Paleontological Resources and Cultural Resources Phase I Assessment for the Buena Vista Water Storage District Northern Area Project, Kern County, California.*

*Attachments: ☐NONE ☑Location Map ☐Sketch Map ☑Continuation Sheet ☑Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☑Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
Primary # P-15-013725
HRI#
BUILDING, STRUCTURE, AND OBJECT RECORD
CA-KER-7701H

***NRHP Status Code** Some segments not surveyed 7R; segments surveyed 6Z

***Resource Name or #:** Segments of the East Side Canal from Semitropic Canal to South of Canal 8, from Lerdo Highway to Milan Road, and from north of Perral Road to Canal 17

B1. Historic Name: East Side Canal B2. Common Name: East Side Canal B3. Original Use: irrigation

B4. Present Use: irrigation ***B5. Architectural Style:** N/A

***B6. Construction History:** (Construction date, alterations, and date of alterations)

The portions of the canal surveyed are on land originally patented to the State of California by the Swamp Land Act of 1850 (*9 Stat. 519*) or to Benjamin B. Eldred by the Homestead Act of 1862 (*12 Stat. 392*) (United States Congress 2011; BLM 2013). This portion of the East Side Canal may have been constructed after the initial irrigation of the southern portion of Miller and Lux land holdings. Land ownership during period of significance includes Miller and Lux, Cox, and Cornwell. It may appear on an 1886 map (with a disclaimer), does not appear on an 1897 Kern Valley Water Company map, and is not discernible on a 1901 map. Webb (2012:23) states that the canal was "constructed by the Kern Valley Water Company under the direction of S.W. Wible in the late 1870s. Initially, the East Side Canal was to serve as the primary irrigation canal for the Buttonwillow Ranch, while the KVWCC was to drain the slough on the western side. In 1898 the canal was 25 feet wide and three to five feet deep. At its intake from the Buena Vista Slough a regulating gate with vertical flashboards controlled water flow and also functioned as a road bridge." A portion of its southern course appears on the McKittrick 1910 USGS map. All segments south of Lerdo Highway appear to have been altered since that time. Webb (2012) has deemed the portions surveyed by JRP as not eligible (different segments than were surveyed by APRMI).

According to Webb (2012: 23-24), "[s]tarting in 1918 through at least 1920, Miller & Lux had extensive work done on the canal . . . Extensive excavation was performed on the canal to increase the working capacity of the canal from 100 second feet [cubic feet per second] to 300 second feet throughout. When the BVWSD acquired East Side Canal in 1926, the canal was 27 miles long and served as the main artery on the east side of the district, supplying . . . irrigation canals on its west side. At the time, most of the control structures on the entire canal system were of wood construction. There were also a few concrete structures present, at Old Headquarters Weir and a few small concrete drops."

***B7. Moved?** ☑No ☐Yes ☐Unknown ***B8. Related Features:** Check dam, levees/roads, culverts

B9a. Architect: S.W. Wible b. Builder: Kern Valley Water Company

***B10. Significance:** Not significant = 6Z **Theme:** Agricultural Development **Area:** western Kern County

Period of Significance: 1870s - 1927 **Property Type:** Canal **Applicable Criteria:** N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

The historic context of the canal system in western Kern County under Miller & Lux and the Buena Vista Water Storage District is provided on a continuation sheet. Only the surveyed segments that could be found on early (1912 and 1927) twentieth century maps (to compare course) were considered for CRHR eligibility, although other segments outside the survey area may be eligible. Maps from initial portion of period of significance (initial irrigation of the Valley) (1886, 1897, and 1901) do not show the East Side Canal, but it had been constructed by then (Webb 2012). The northern portion (south of Semitropic Canal) may not have been constructed, but even the constructed southern portions are not mapped. The East Side Canal played an integral part of the development of irrigation (Pattern in CA history, Criterion 1; engineered by Wible, Criterion 3), and if portions are intact as far as course and depth/angle, even with modern turnouts, gates, different water supply, etc., they could be considered eligible. This evaluation differs from Webb's, as the present evaluation finds the East Side Canal significant enough to be considered for listing in the CRHR, while Webb's did not. In any case, the current analysis finds the integrity of the canal has not been retained, as changes in course and depth/angle have occurred. Per the segments surveyed by APRMI, they were deemed not eligible, as they have changed course and/or characteristics since initial irrigation. For some segments, their course could only be defined as far back as 1927, but their depth and angle were considered too modified to have retained integrity. Constant realignment, reshaping, and replacement of control structures has compromised the integrity of the segments surveyed. Therefore the segments of the East Side Canal surveyed are not deemed eligible for CRHR or NRHP.

B11. Additional Resource Attributes: (AH6) – Water conveyance system, (AH7) – Roads

***B12. References:** See last continuation sheet .

B13. Remarks: segments surveyed 6Z

***B14. Evaluator:** Linda Akyüz

***Date of Evaluation:** January 7-11, 2013; March 22, 2013; April 2, 2013

DPR 523 B

(Sketch Map with north arrow required.)

Portions Surveyed
= where Photo 1030010 was taken

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LINEAR FEATURE RECORD

Primary # P-15- 013725
HRI #
Trinomial CA-KER- 7761 H

***Resource Name or #:** Segments of the East Side Canal from Semitropic Canal to South of Canal 8, from Lerdo Highway to Milan Road, and from north of Perral Road to Canal 17

L1. Historic and/or Common Name: East Side Canal

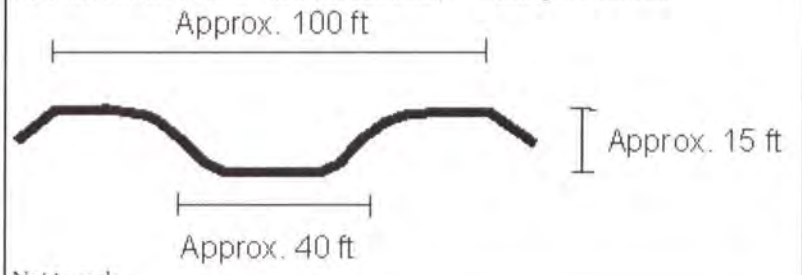
L2a. Portion Described: ☐ Entire Resource ☑ Segment ☐ Point Observation **Designation:** (see below)

b. Location of point or segment: 267296 mE/ 3931452 mN (NAD83) – Lerdo Highway crossing
269301 mE/ 3927602 mN to 268901 mE/ 3928531 mN (NAD83) – Alternate 1
266640 mE/ 3932724 mN to 264213 mE/ 3937911 mN (NAD83) – Primary 3

L3. Description: (Describe construction details, materials, and artifacts found at this segment/point. Provide plans/sections as appropriate.)
The East Side Canal is a trapezoidal, earth-lined canal that forms the eastern boundary of the Buena Vista Water Storage District and supplies subsidiary canals and laterals. It runs from its southern origins at the weir (south of the current Project area) for approximately 24.1 miles and ends at Goose Lake Canal (Webb 2012: 16). The canal itself measures approximately 15 feet deep and 40 feet wide, while the canal with its accompanying roads measures approximately 100 feet across.

L4. Dimensions: (estimated)
- **a. Top Width:** 100 feet
- **b. Bottom Width:** 40 feet
- **c. Height or Depth:** 15 feet
- **d. Length of Segment:** 4.75 miles total

L4e. Sketch of Cross-Section (include scale) **Facing:** Northwest



Not to scale

L5. Associated Resources: road

L6. Setting: Agricultural land located on both sides of canal with portions along the west side being recently tilled/furrowed.

L7. Integrity Considerations: The canal has served the area's agriculture, a major event or theme in California's history, but not all portions of it run its original course. The portions whose route has changed are not eligible for listing in the CRHR. Although some of these occurred over 50 years ago, they occurred after the period of significance (when it was first built) for the canal. Canals and ditches are reshaped twice a year and re-excavated approximately every five years (Webb 2012). This, in and of itself, does not necessarily compromise integrity, unless the original shape and feeling of the water conveyance is lost (dredging actually retains the integrity of the canal if it retains its original shape and course). It appears, although the course of some segments have not changed course since 1927, the reshaping of the canal's channel has compromised its integrity. Course alterations to the East Side Canal route, apparent just south of Lerdo Highway, occurred between 1907 and 1954 (USGS 1912, 1934, 1950, 1954). Alterations to the route north of the Semitropic Canal crossing is apparent (USGS 1931, 1973a). Some segments between Semitropic Canal and Lerdo Highway follow the same course since 1927, but it is not known what that course was before 1927. Earlier maps are needed to make this conclusion. The "Old East Side Canal" is shown on maps from 1912 (surveyed 1907-1908) to between 1950 and 1954 (USGS 1910, 1934, 1950, 1954). Alterations to the East Side Canal route just south of Lerdo Highway occurred between 1910 and 1954. Alterations to the route in the northern end past the Semitropic Canal crossing occurred post-1950. Portions of the segment between Lerdo Highway and the Semitropic Canal might have been eligible for inclusion in the CRHR under Criteria 1, 2, 3, 4 for association with important patterns in California history and with important figures in California irrigation, important engineering, and because of research potential. However, integrity has not been retained, and therefore the segments surveyed are not considered eligible for CRHR or NRHP. 1914 Lost Hills 30'-quadrangle map does not have the area where the (nortyhern part of the) canal is located mapped. Earliest version of that area found is on Semitropic 1927/Goose Lake 1931 (1927).

L8a. Photograph, Map or Drawing

Drawing P1030014, facing North, 1/8/2013

L8b. Description of Photo, Map, or

L10. Form Prepared by: Linda Akyüz and Denise Ruzicka, ArchaeoPaleo Resource Management, Inc., 1531 Pontius Ave Suite 200, Los Angeles, CA 90025 **L11. Date:** 25 March 2013 **DPR 523E (1/95)**

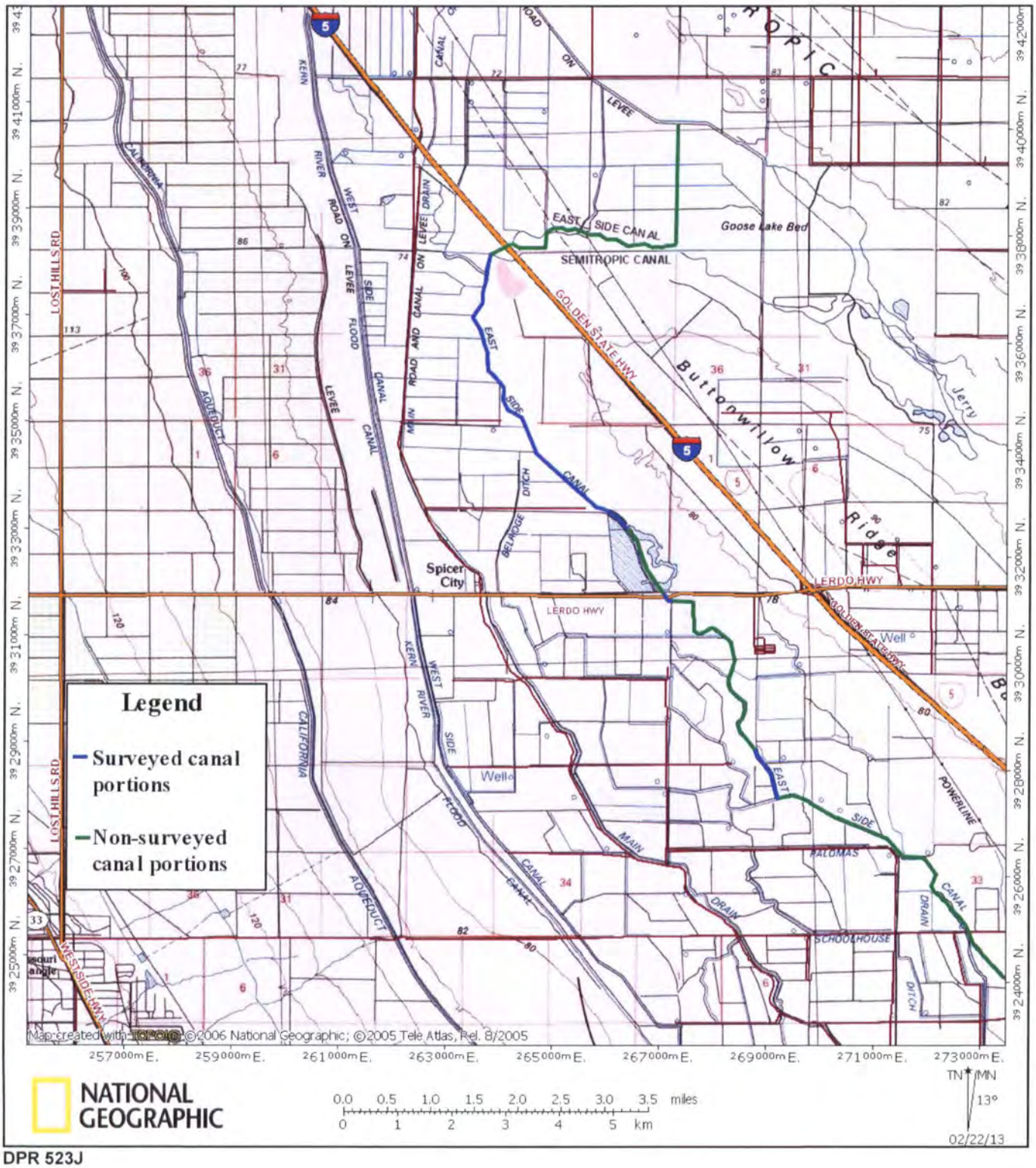
State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary # P-15-013725
HRI#
Trinomial CA-KER-7701 H

*Resource Name or #: Segments of the East Side Canal from Semitropic Canal to South of Canal 8, from Lerdo Highway to Milan Road, and from north of Perral Road to Canal 17

*Map Name: Semitropic and Lokern *Scale: 1:100K *Date of Map: 1954/PR1973



DPR 523J

Summarized or excerpted from Webb (2013: 18-21):

The Buena Vista Slough, the marshy area between Buena Vista Lake and Tulare Lake, was granted to the State of California under the Arkansas Act of September 28, 1850. "In 1851, the federal government removed San Joaquin Valley tribes from the region" in order to open it to settlement." The seasonal nature of the swamp land led to disagreements between state and federal surveyors about boundaries. Some parcels sold as 'dry' by the federal government were "sold by the state as swamp and overflowed" lands. Ultimately, California conducted its own surveys in the area, and "on December 5, 1871, and the Secretary of the Interior accepted the state's proposed boundaries".

By 1868, California required payment of $1.00 per acre, "which was refundable if the land was 'reclaimed'." Henry Miller, Charles Lux, John Redington, Horatio Stebbins, F.A. Tracy, H.L. Bonestell, and Horatio Livermore acquired their acreage on the lower Kern River west of Bakersfield, also acquiring "swampland certificates of purchase from would-be settlers or from local agents like Julius Chester, Duncan Beaumont, Richard Stretch and Thomas Baker, whose earliest claims in the area dated to January 28, 1870. In this manner, Miller & Lux secured their 'Southern Division' surrounding Buttonwillow in Kern and Kings Counties." The area "operated under this single ownership from the 1870s until 1927, when Miller & Lux Incorporated started selling the land."

Miller & Lux principally raised cattle on Buttonwillow Ranch, which did not require large-scale irrigation. However, in order to "reclaim" the lands, drainage and irrigation canals had to be constructed. "In accordance with Assembly Bill 54 of 1861, Swampland District 121 was formed in May 1871, including swamplands along Buena Vista Slough." Afterwards, Miller & Lux and others with cattle ranges in the Slough organized the Kern Valley Water Company in 1876. "The system created during the Miller & Lux period consisted of canals dug and maintained by Miller & Lux, and a system of laterals dug and maintained by individual tenant farmers." In particular, the Kern Valley Water Company dug the "Kern Valley Water Company's Canal" (KVWCC/Kern River Flood Channel/Canal) in 1877 to drain the slough on the west side. The canal was completed in 1878. After constructing the Kern River Flood Canal along the west side of the Slough, Miller & Lux constructed the East Side and West Side canals for distribution prior to the early 1890s. The canals bordered the east and west sides of Buttonwillow Ranch (more or less the Buena Vista Slough). The West Side Canal paralled the KVWCC.

Prior to the construction of many of the canals, Miller & Lux found themselves with no water and 10,000 head of cattle during the drought season of 1876-1877. They pinpointed upstream diversions of water from the Kern River from such landowners as James B. Haggin as the cause of the lack of water. "Miller & Lux's attempts to control the Buena Vista Slough through construction of the KVWC played a role in the events that led to the landmark water rights case, *Lux v. Haggin*." Miller & Lux claimed that they had riparian rights to the Kern River and that Haggin and others did not have the right to divert all the water. Ultimately, in 1888, the Miller-Haggin agreement settled water-rights claims, for the most part, where a portion of the water was allowed to be diverted upstream and the rest was to be available to those downstream.

Miller & Lux later constructed a drainage canal (Main Drain), from the southern end near the old headquarters north to the center of the ranch between 1916 and 1918. "Farmers used the water from Main Drain, collected primarily by seepage, for irrigation. The remainder of the canals and laterals in the area ... were primarily works of individual farmers and Miller & Lux farm divisions in the area, who connected to the main canal system for irrigation of their crops." By 1919, Miller & Lux were farming the entire area south of Buttonwillow between the West Side and East Side canals south to the Old Headquarters. At that time it became apparent that in order to sell the land, it was essential to provide an adequate water supply for the land. Therefore, in 1920, "the California State Engineer released a report on the water resources of the Kern River and recommended that a large district, including the Haggin and Miller & Lux water rights, be formed to manage water distribution. Despite the effective implementation of the Miller-Haggin agreement, the two parties chose to protect their interests by forming separate districts. Miller & Lux's holdings became the nucleus of the Buena Vista Water Storage District. The district submitted a petition for formation to the State Engineer in 1922 and received approval in 1924. As a part of district formation, Miller & Lux linked water rights to the land within the district, making future sales possible."

"The district acquired all the canals in the study area, including flood water canals, irrigation canals, drainage canals, and associated water control features. The Kern Valley Water Company Canal (Miller & Lux owned 86% of the company) was the largest canal the district acquired in the area."

Water levels rose after 1935, which required improvements to the drainage system and thus, 4.8 miles of new drains were constructed in 1943 and 1944. Culverts, bridges, and roads were also added. "Redwood culverts and corrugated metal pipe culverts, some installed by Miller & Lux, began to be replaced."

In 1943, the Buena Vista Water Storage District implemented a canal maintenance program of regular hand maintenance as well as mechanized maintenance every four years. "Today, the canals are reshaped twice a year and re-excavated approximately every five years." Ditches and drains have been relocated to the edges of fields to accommodate mechanized farming.

"Larger changes [have since] occurred to the water supply for the canals . . .The Army Corps of Engineers developed plans for Lake Isabella in the 1930s (as a new source of water: Lake Isabella is a result of the damming of the Kern River), but World War II delayed construction. The earthen Isabella Dam was finally completed in 1953 . . . The system also receives water from the California Aqueduct."

B.12. References (continued):

Bureau of Land Management (BLM). 2013. U.S. Department of Interior Bureau of Land Management General Land Office Records <www.glorecords.blm.gov>

Hammond, William. 1886 Sheet No. 4, Southern Portion, Irrigation Map of the San Joaquin Valley, California. California State Engineering Department, Sacramento.

Kern County Land Company 1897 Kern County Map of the Kern Delta. On file at the Library of Congress.

JRP Historical Consulting Services and California Department of Transportation (JRP and DOT) 2000 Water Conveyance Systems in California: Historic Context Development and Evaluation Procedures

Nationwide Environmental Title Research, LLC (NetrOnline). 2013. Historical Aerials <www.historicalaerials.com>

Randall and Denne, Publishers. 1901 Kern County Atlas. Kern County Map, Page 12, Page 46. On file at the Library of Congress.

United States Congress. 2011. *United States Statutes at Large*, United States Government Printing Office.

United States Geological Survey (USGS). 1910. *McKittrick Quadrangle*. California-Kern Co., 30-Minute Series (Topographic).

1914. *Lost Hills Quadrangle*. California-Kern Co., 30-Minute Series (Topographic). [currently Semitropic Quadrangle]

1931. *Goose Lake Quadrangle*. California-Kern Co., 7.5-Minute Series (Topographic). [currently Semitropic Quadrangle]

1934. *Lokern Quadrangle*. California-Kern Co., 7.5-Minute Series (Topographic).

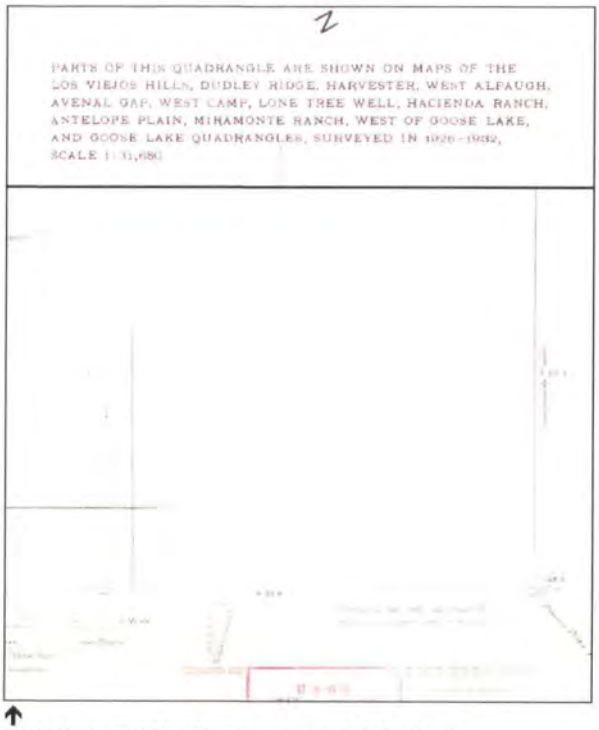
1950. *Lokern Quadrangle*, California-Kern Co., 7.5-Minute Series (Topographic).

1954. *Lokern Quadrangle*, California-Kern Co., 7.5-Minute Series (Topographic).

1973. *Semitropic Quadrangle*, California-Kern Co., 7.5-Minute Series (Topographic). [photorevised from 1954]

URS. 2012a, 2012b. Responses to CEC Data Requests Set Three (45-Day Extension): Amended Application for Certification for HYDROGEN ENERGY CALIFORNIA (08-AFC-8A), Kern County, California, and Responses to CEC Data Requests –Nos. A181 through A217

Webb, Toni. 2012. Primary Record for "Portions of Buena Vista Water Storage District" (not submitted at time of this evaluation).



↑
Historic Lost Hills Quadrangle (USGS 1914):
portion of land where canal is located had not been not mapped until 1931 (surveyed 1927)

Historic Semitropic (Goose Lake) Quadrangle
(USGS 1931, surveyed 1927) >>>>>>>>>>>>>>>>>>>>>>>>>>>

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

CONTINUATION SHEET

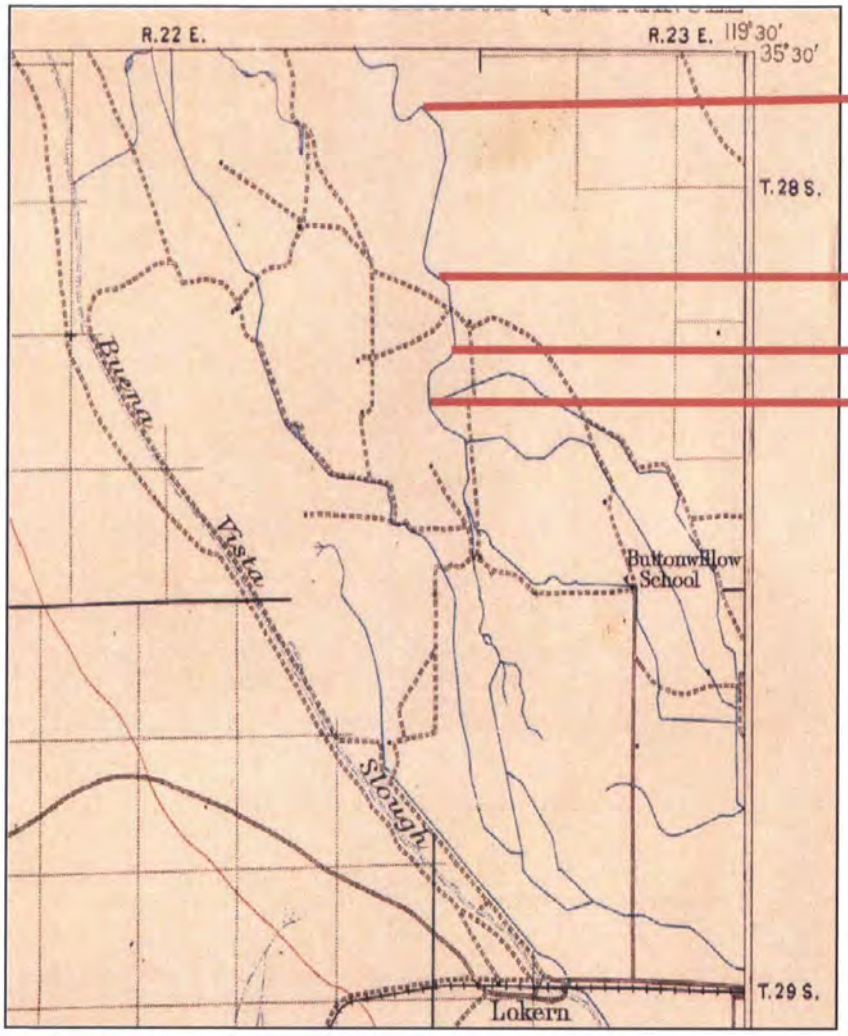
Primary # P-15-013725
HRI#
Trinomial CA-Ker-7701H

 *Resource Name or #: Segments of the East Side Canal from Semitropic Canal to South of Canal 8, from Lerdo Highway to Milan Road, and from north of Perral Road to Canal 17

*Recorded by: Ruzicka, Akyüz, Casado, Shattuck *Date: Map 1934 ☑ Continuation ☐ Update

Points along the canal geo-referenced with each other in red.

Historic McKittrick Quadrangle (USGS 1910)



Historic Lokern Quadrangle (USGS 1934)

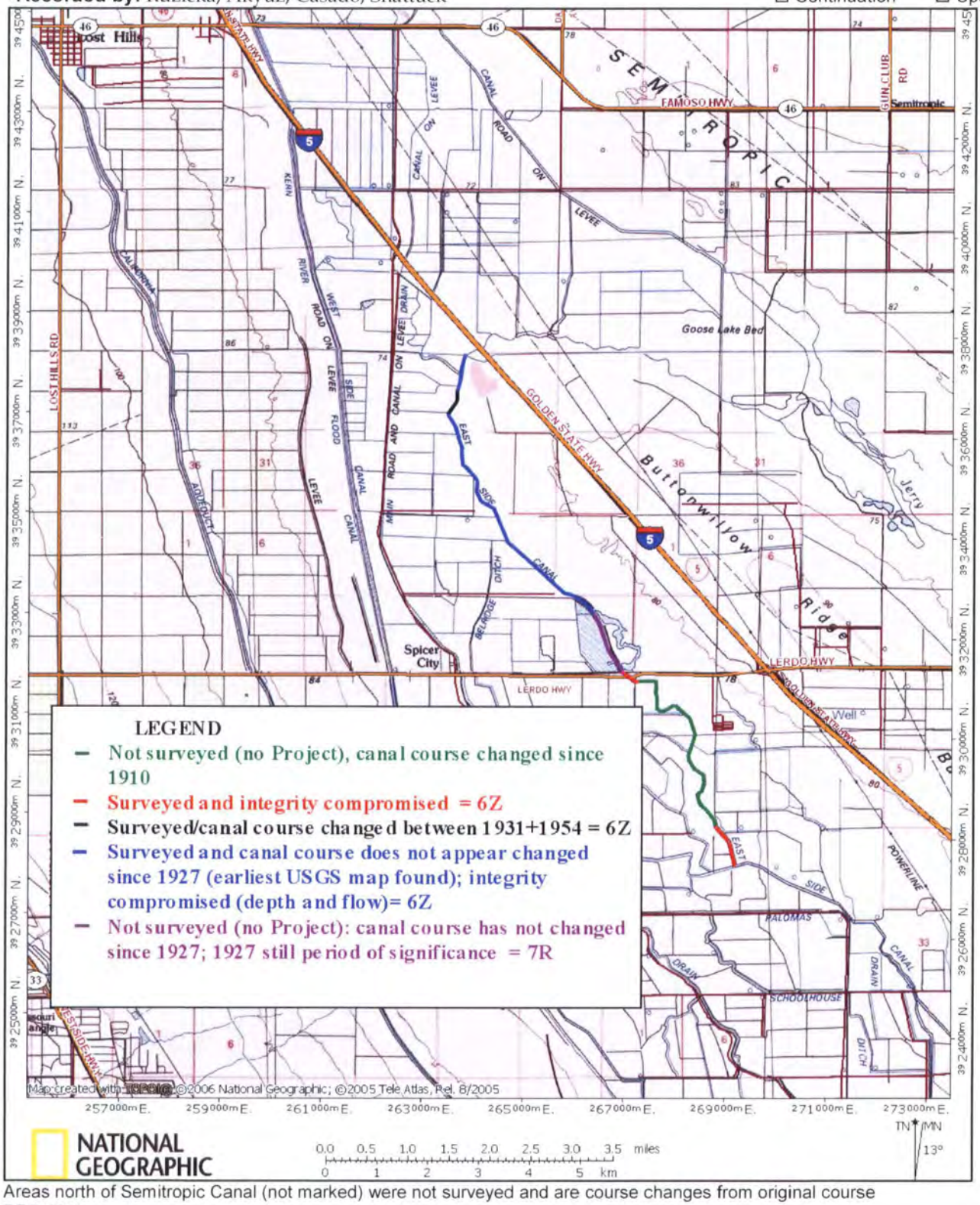
EVALUATION:
See maps. NO part within survey area was deemed eligible for CRHR. Some surveyed portions had changed course or aspect since 1910. Some surveyed portions had changed course between 1927 or 1931 and 1954. Other portions surveyed that did not appear to have changed course since 1927 could only be traced back to 1927, which is after initial irrigation. In any case, the segments that have retained course since 1927 have changed shaped too much to have integrity for eligibility. Map legend gives Status Codes.

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary # P-15-013725
HRI#
Trinomial CA-KER-7701H

 ***Resource Name or #:** Segments of the East Side Canal from Semitropic Canal to South of Canal 8, from Lerdo Highway to Milan Road, and from north of Perral Road to Canal 17

***Recorded by:** Ruzicka, Akyüz, Casado, Shattuck ☑ Continuation ☐ Update



Areas north of Semitropic Canal (not marked) were not surveyed and are course changes from original course

DPR 523L

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

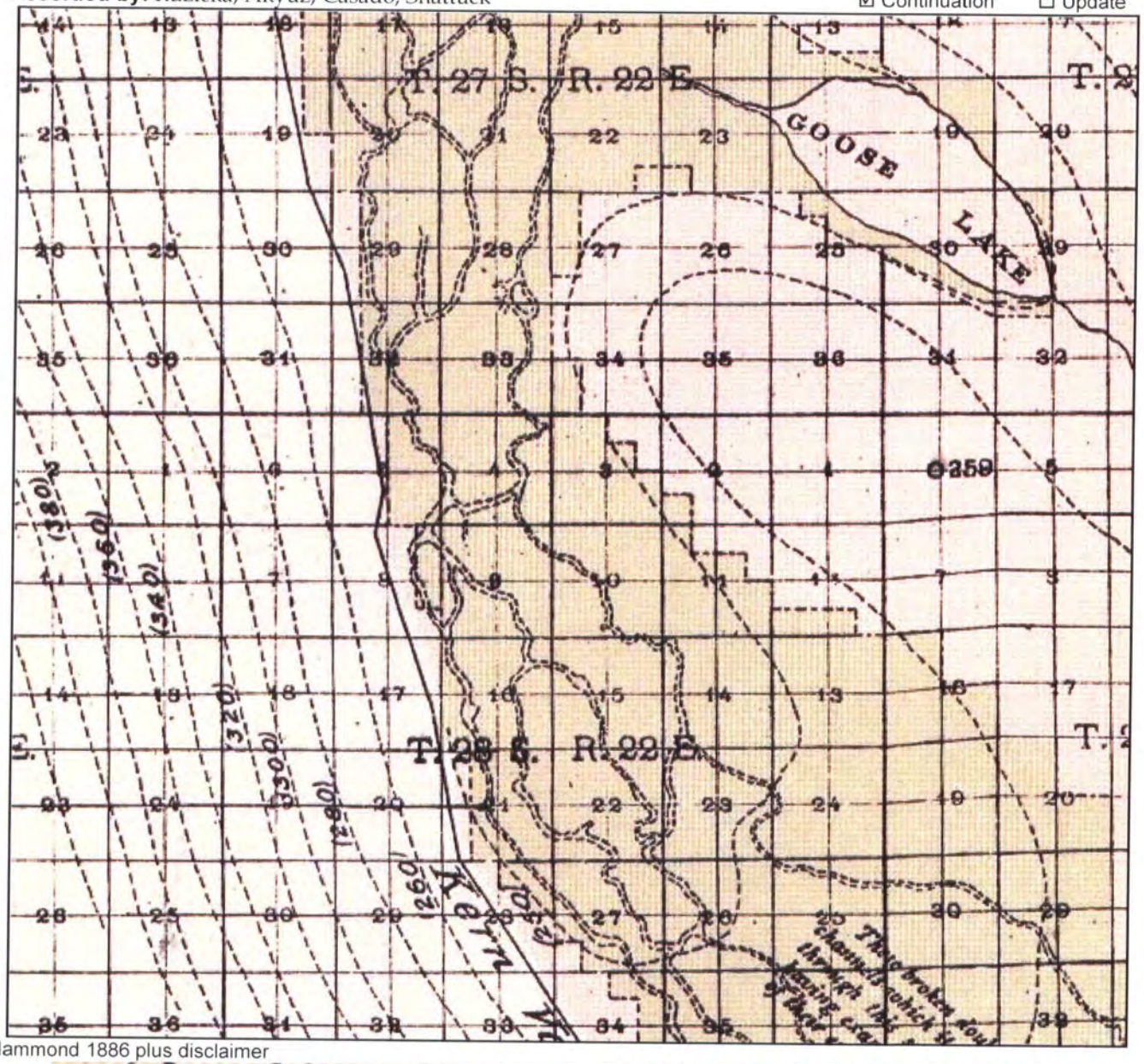
CONTINUATION SHEET

Primary # P-15-013725
HRI#
Trinomial CA-KER-7701H

*Resource Name or #: Segments of the East Side Canal from Semitropic Canal to South of Canal 8, from Lerdo Highway to Milan Road, and from north of Perral Road to Canal 17

*Recorded by: Ruzicka, Akyüz, Casado, Shattuck

☑ Continuation ☐ Update



Hammond 1886 plus disclaimer

State of California — The Resources Agency DEPARTMENT OF PARKS AND RECREATION	Primary # P-15-013725 HRI#
CONTINUATION SHEET	Trinomial CA-Ker-7701H

 *Resource Name or #: Segments of the East Side Canal from Semitropic Canal to South of Canal 8, from Lerdo Highway to Milan Road, and from north of Perral Road to Canal 17

*Recorded by: Ruzicka, Akyüz, Casado, Shattuck ☑ Continuation ☐ Update

Kern County Land Company (1897): T27S at top

DPR 523L

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # P-15-013725
HRI #
Trinomial CA-KER-7701H
NRHP Status Code

Other Listings
Review Code | Reviewer | Date

*Resource Name or #: East Side Canal

P1. Other Identifier:
*P2. Location: ☑ Not for Publication ☐ Unrestricted *a. County: Kern
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
*b. USGS 7.5' Quad: Tupman Date: 1977 T30 S; R 24E; SW¼ of SW¼ of Sec 2 ; M.D. B.M.
*b. USGS 7.5' Quad: Tupman Date: 1977 T30 S; R 24E; NW¼ of NW¼ of Sec 11 ; M.D. B.M.
c. Address: City: Zip:
d. UTM: Zone: 11 ; 284300 mE/3914200mN to 284450mE/3912597mN(G.P.S.)
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate) Elevation: 310 ft.

*P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
A segment of the East Side Canal was recorded during the current survey, running north from Station Road for exactly 1 mile to the center of Section 2 (from 35°, 20', 51" N; 119°, 22', 25" W to 35°, 19', 59" N; 119°, 22', 18" W)

The East Side Canal is earth-lined and trapezoidal in profile, with dirt access roads running along either side. The canal measures approximately 50 feet wide across the top. The canal was constructed in the 1870s; however, it is still in use and appears to receive regular maintenance and scraping.

*P3b. Resource Attributes: (List attributes and codes) HP20. Canal/aqueduct
*P4. Resources Present: ☐Building ☑Structure ☐Object ☐Site ☐District ☐Element of District ☐Other (Isolates, etc.)

P5a. Photo or Drawing (Photo required for buildings, structures, and objects.)

P5b. Description of Photo: (View, date, accession #)
S, 7-13-2009, Digital

*P6. Date Constructed/Age and Sources: ☑Historic
☐Prehistoric ☐Both

*P7. Owner and Address:

*P8. Recorded by: (Name, affiliation, and address)
M. Bray, ESA
707 Wilshire Blvd Suite 1450
Los Angeles, CA 90017

*P9. Date Recorded: 15 July 2009

*P10. Survey Type: (Describe)

Intensive Pedestrian

*P11. Report Citation: (Cite survey report and other sources, or enter "none.") Bray, Madeleine, Ehringer, Candace, and Tietjen, Damien. *Phase I Cultural Resources Assessment for the West Kern Water District Project*, Prepared by ESA, Submitted to the West Kern Water District, February, 2010.

*Attachments: ☐NONE ☑Location Map ☐Sketch Map ☐Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

State of Claifornia- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

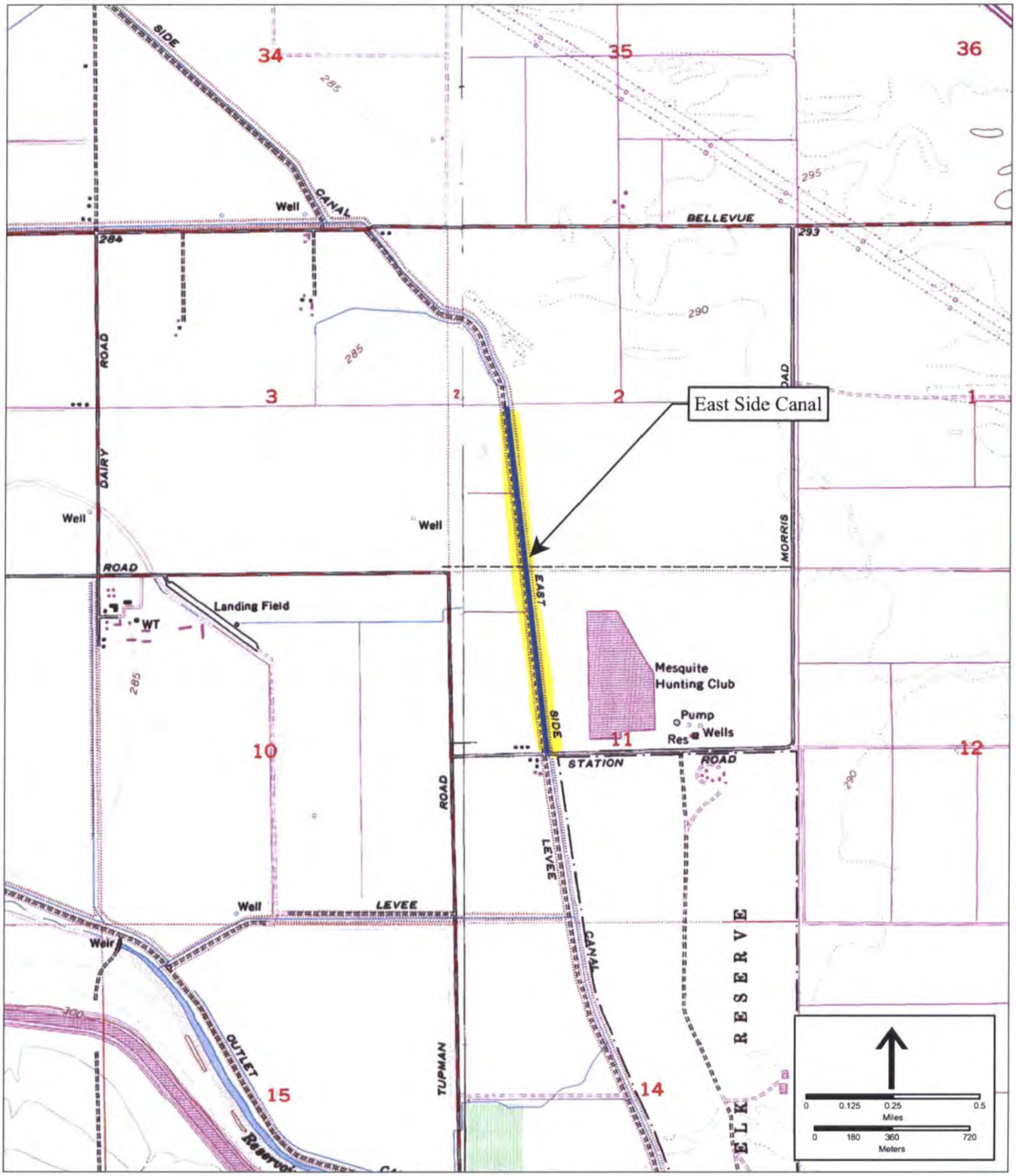
Primary # P-15013725
HRI #
Trinomial CA-KER-7701H

* Resource Name or Number: East Side Canal

*Map name: Tupman, Calif.

*Scale: 1:24000

*Date of Map: 1977



J:\GIS\Projects\209xx\209033\cultural\209033_DPR_Resource_location_D_7.mxd

* Required Information

P 15 -13725

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial CA-Ker -07701H
NRHP Status Code 7
Other Listings _____
Review Code _____ Reviewer _____ Date _____

Page 1 of 5 *Resource Name or #: JKE-001

RECEIVED
FEB 09 2010
By _____

P1. Other Identifier: East Side Canal
* P2. Location: ☐ Not for Publication ☑ Unrestricted *a. County: Kern
* b. USGS Quad: Buttonwillow (1954; photorevised 1973); T29S R23E, Sec. 13; MDBM
c. Address:
d. UTM: Zone 11; 277181 mE/ 3919886 mN NAD27 Datum
e. Other Locational Data:
The resource is located east of the town of Buttonwillow, on both sides of State Route (SR) 58, partially within the highway right-of-way and one meter from the edge-of-pavement. From the intersection of SR 58 and Buttonwillow Drive within Buttonwillow, proceed 1.2 miles east on SR 58 to post mile paddle 28.50 (segment datum). The resource is located 100 feet east of the post mile paddle.

* P3a. Description:
This is a segment of the East Side Canal, recorded at a location where it intersects SR 58 in rural Kern County. The Miller and Lux Company controlled the Kern Valley Water Company and built the East Side Canal in the late 1870s. The cattle barons planned the canal as the primary irrigation ditch for their Buttonwillow Ranch. When constructed it was 25 feet wide, three to five feet deep, and drew water from Buena Vista Slough. From 1918 to 1920, Miller & Lux improved the canal to expand its water capacity, including construction of a levee along its banks north of Buttonwillow (Barnes 1920: 7-8; Miller & Lux, 1916-1919). When the Buena Vista Water Storage District (BVWSD) acquired the East Side Canal in 1926, the canal was 27 miles long and served as the main irrigation canal on the east side of the district. BVWSD replaced the wooden control structures and lined the canal with concrete at certain locations (Hammett 1926; Raznoff 1945). The conduit is currently 24.1 miles long and runs in a northwesterly direction; it remains owned by BVWSD. See Continuation Sheet and Linear Feature Record for a detailed description of the resource.

* P3b. Resource Attributes: HP20 (Canal)
* P4. Resources Present: ☐ Building ☑ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

*P5b. Description of Photo:
Photograph 1. JKE-001, Seg A, 02, NW -- 9841; facing northwest, SR 58 in the foreground.

*P6. Date Constructed/Age & Sources:
☑ Historic ☐ Prehistoric ☐ Both
Circa 1878 (Barnes 1920)

*P7. Owner and Address:
Buena Vista Water Storage District,
525 North Main
Buttonwillow, CA 93206

*P8. Recorded by:
Steven J. Melvin and Rebecca Flores, JRP Historical Consulting, LLC, 1490 Drew Ave, Suite 110, Davis, CA 95618

*P9. Date Recorded: 4/21/2009

*P10. Survey Type:
Reconnaissance

* P11. Citation: Leach-Palm et al. 2010. Cultural Resources Inventory of Caltrans Districts 9 Rural Conventional Highways in Inyo and Mono Counties. Submitted to Caltrans District 9, Bishop, CA.

* Attachments: ☐ None ☑ Location Map ☑ Sketch Map ☑ Continuation Sheet ☐ Building, Structure, and Object Record
☐ Archaeological Record ☐ District Record ☑ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record
☐ Artifact Record ☐ Photograph Record ☐ Other:

P 15 -13725

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LINEAR FEATURE RECORD

Primary # _____
HRI # CA-Ker - 07701H
Trinomial _____

 ***Resource Name or #:** JKE-001

L1. Historic and/or Common Name: East Side Canal

L2a. Portion Described: ☐ Entire Resource ☑ Segment ☐ Point Observation **Designation:**

L2b. Location of Point or Segment:

The resource is located at GIS-based post mile 28.50 on SR 58.

Segment UTMs: 277166mE/ 3920093mN to 277209mE/ 3920037mN

L3. Description:

The canal at this location is unlined south of SR 58 and concrete-lined north of the highway. It has a trapezoidal shape with moderately steep sides and a flat bottom. The top of the canal is level with the surrounding terrain and there are dirt access roads along both sides of the canal. South of the highway, and just out of the right-of-way, a railroad bridge passes over the canal. The short segment of canal between the railroad and the highway is not as neatly maintained as it is further south.

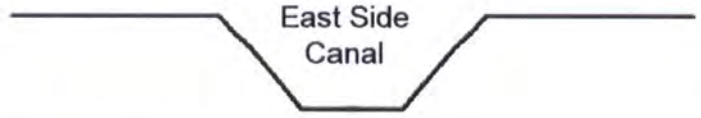
L4. Dimensions:

- **a. Top Width:** 45 feet
- **b. Bottom Width:** 6 feet
- **c. Height or Depth:** 12 feet
- **d. Length of Segment:** 100 feet

L5. Associated Resources:

Bridge No. 50-0017; railroad bridge (out of right-of-way)

L4e. Sketch of Cross-Section: **Facing:** North



Not to scale

L6. Setting:

The canal winds through flat, agricultural land in the southern San Joaquin Valley.

L7. Integrity Considerations:

The canal has been concrete-lined and enlarged.

L8b. Description of Photo, Map, or Drawing

JKE-001, Seg A, 04, SE -- 9843; facing southeast, showing unlined side of the canal.

L9. Remarks:

L10. Form Prepared By:

S. Melvin, JRP Historical Consulting, LLC, 1490 Drew Ave, Suite 110, Davis CA 95618

L11. Date: 4/21/2009

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary # _____
HRI # _____
Trinomial CA-Ker -07701H

 *Resource Name or #: JKE-001

*Recorded By: S. Melvin and R. Flores, JRP Historical Consulting, LLC *Date: 4/21/2009 ☑ Continuation ☐ Update

P3a. Description (continued):

References:

Barnes, Harry. "Data on Irrigation of Buttonwillow Ranch and Adjacent Lands," 1920. Unpublished manuscript. Available at Water Resources Center Archives, University of California, Berkeley.

Hammett, W.C. "Report on Re-evaluation of Physical Properties to be Acquired by Buena Vista Water Storage District." San Francisco: n.p., September 4, 1926.

Miller & Lux, CG-163, Buttonwillow Files, Carton 694, East Side Canal, 1916-1919. Available at Bancroft Library, University of California, Berkeley.

Raznoff, William A. Drainage Investigations Buttonwillow Area of Kern County, California. US Dept. of Agriculture, Soil Conservation Service, Water Conservation Division, Pacific Coast, Region 7, 1945.

P 15 -13725

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

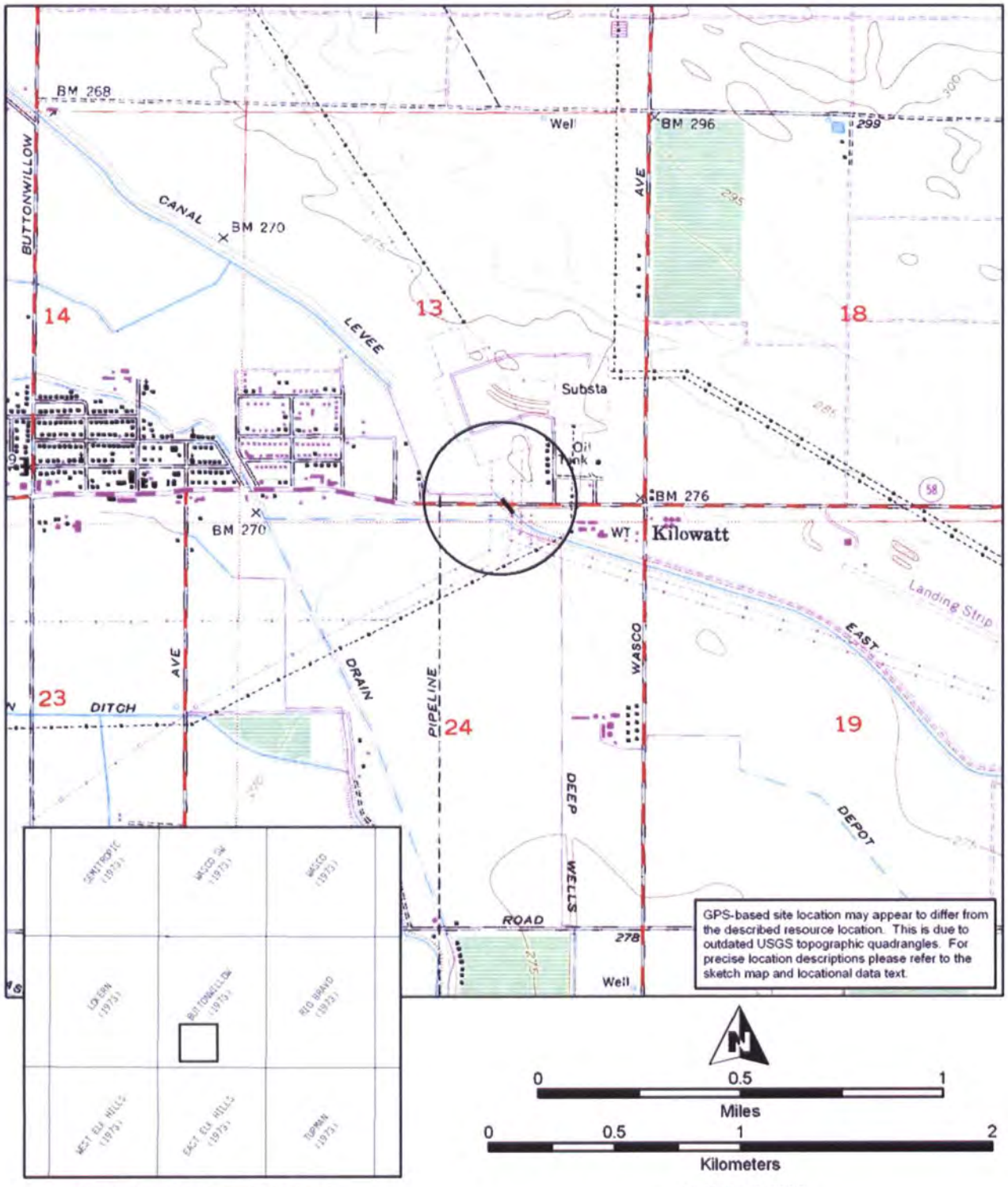
LOCATION MAP

Primary # _____
HRI # _____
Trinomial CA-KER -07701H

*Resource Name or #: JKE-001

*Map Name: Buttonwillow (1973)

*Year: 1973



Key to USGS 7.5' quads depicted

SCALE 1:24,000

*Required Information

P 15 -13725

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

SKETCH MAP

Primary # _____
HRI # _____
Trinomial CA-KER -07701H

*Resource Name or #: JKE-001

*Drawn By: Far Western and JRP Historical Consulting, LLC

*Date: 04/21/2009

Sketch map is based on 2009 GPS data collected within the highway right-of-way.

*Required Information

State of California--The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code 6Z
Other Listings
Review Code Reviewer Date

*Resource Name or # (Assigned by recorder) CRM TECH 3856-1

P1. Other Identifier:

***P2.** Location: √ Not for Publication ___ Unrestricted

***a.** County Kern and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b.** USGS 7.5' Quad Buttonwillow, Calif. Date 1954/1973
T29S; R23E; NE 1/4 of NW 1/4 of Sec 13 ; M.D. B.M.

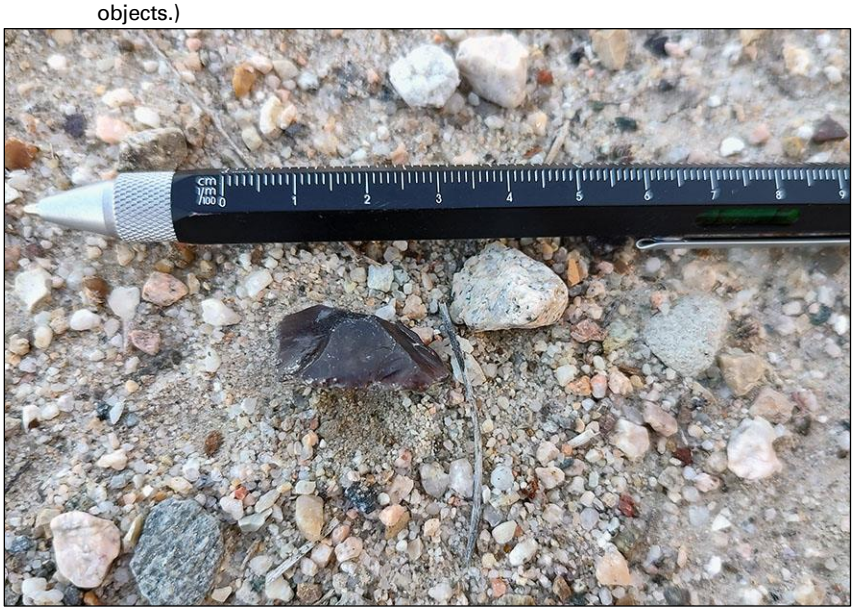
c. Address N/A City Buttonwillow Zip

d. UTM: (Give more than one for large and/or linear resources) Zone 11 ; 276,567 mE/ 3,921,575 mN
UTM Derivation: √ USGS Quad ___ GPS (NAD 83)

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, decimal degrees, etc., as appropriate) APN 101-060-12; approximately 73 meters south from Sullivan Road, near the unpaved extension of Meadow Street

***P3a.** Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries) A single piece of mottled dark brown Monterey chert debitage measuring 2.6 x 1.7 x 0.8 cm with multiple flake scars and evidence of chipping or working along one edge.

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects.)



***P3b.Resource Attributes:** (List attributes and codes) AP16: Other (isolated lithic flake)

***P4. Resources Present:** ☐ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☒ Other (Isolates, etc.)

P5b. Description of Photo: (view, date, accession #) May 5, 2022

***P6. Date Constructed/Age and Source:** ☐ Historic ☒ Prehistoric ☐ Both

***P7. Owner and Address:** Buttonwillow County Water District, 289 North Main Street, Buttonwillow, CA 93206

***P8. Recorded by:** (Name, affiliation, and address) Hunter O'Donnell, CRM TECH, 1016 East Cooley Drive, Suite A/B, Colton, CA 92324

***P9. Date Recorded:** May 5, 2022

***P10. Survey Type:** (Describe) Intensive-level survey for CEQA and Section 106 compliance

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.") Tang, Bai "Tom," Deirdre Encarnación, and Hunter O'Donnell (2022): Identification and Evaluation of Historic Properties: Buttonwillow County Water District Wastewater Treatment Plant Improvements Project, near the Community of Buttonwillow, Kern County, California

***Attachments:** ☐ NONE ☒ Location Map ☐ Continuation Sheet ☐ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Resource Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other (List):

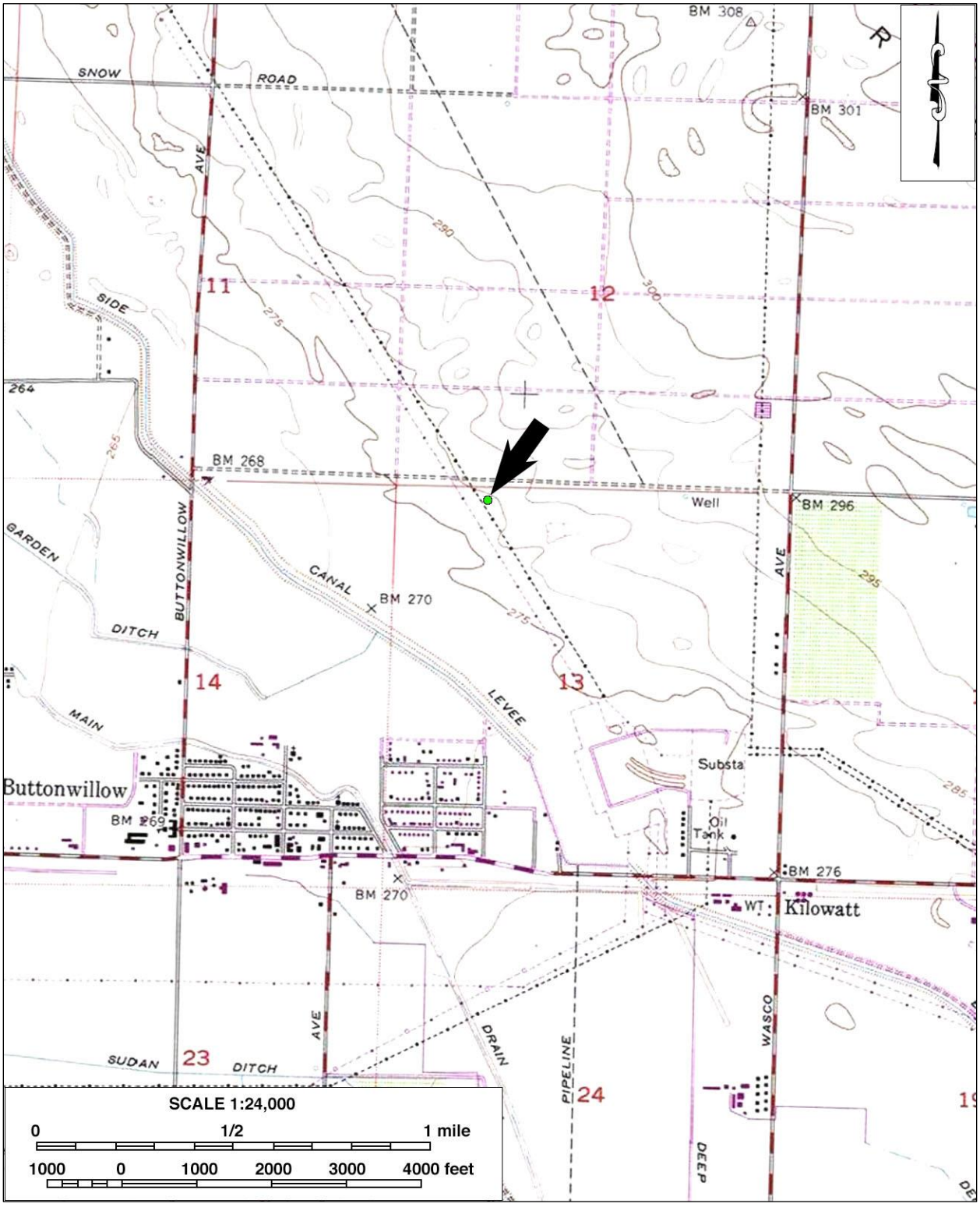
State of California--Natural Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary # _____
HRI # _____
Trinomial _____

*Resource Name or # (Assigned by recorder) CRM TECH 3856-1

*Map Name: Buttonwillow, Calif. *Scale: 1:24,000 *Date of Map: 1954/1973



*Required information

State of California--The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code 6Z
Other Listings _____
Review Code _____ Reviewer _____ Date _____

Page 1 of 2 *Resource Name or # (Assigned by recorder) CRM TECH 3856-2

P1. Other Identifier:
***P2. Location:** √ Not for Publication ___ Unrestricted

***a. County** Kern **and** (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad** Buttonwillow, Calif. **Date** 1954/1973
T29S; **R**23E; NE **1/4 of** NW **1/4 of Sec** 13 ; M.D. **B.M.**

c. Address N/A **City** Buttonwillow **Zip** _____

d. UTM: (Give more than one for large and/or linear resources) **Zone** 11 ; 276,566 **mE/** 3,921,563 **mN**
UTM Derivation: √ USGS Quad ___ GPS (NAD 83)

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, decimal degrees, etc., as appropriate) APN 101-060-12; approximately 94 meters south from Sullivan Road, near the unpaved extension of Meadow Street

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries) A single piece of mottled orange-light brown chert debitage measuring 3.3 x 1.7 x 1.5 cm, with multiple flake scars on its surface.

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects.)

***P3b.Resource Attributes:** (List attributes and codes) AP16: Other (isolated lithic flake)

***P4. Resources Present:** ☐ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☒ Other (Isolates, etc.)

P5b. Description of Photo: (view, date, accession #) May 5, 2022

***P6. Date Constructed/Age and Source:** ☐ Historic ☒ Prehistoric ☐ Both

***P7. Owner and Address:** Buttonwillow County Water District, 289 North Main Street, Buttonwillow, CA 93206

***P8. Recorded by:** (Name, affiliation, and address) Hunter O'Donnell, CRM TECH, 1016 East Cooley Drive, Suite A/B, Colton, CA 92324

***P9. Date Recorded:** May 5, 2022

***P10. Survey Type:** (Describe) Intensive-level survey for CEQA and Section 106 compliance

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.") Tang, Bai "Tom," Deirdre Encarnación, and Hunter O'Donnell (2022): Identification and Evaluation of Historic Properties: Buttonwillow County Water District Wastewater Treatment Plant Improvements Project, near the Community of Buttonwillow, Kern County, California

***Attachments:** ☐ NONE ☒ Location Map ☐ Continuation Sheet ☐ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Resource Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other (List): _____

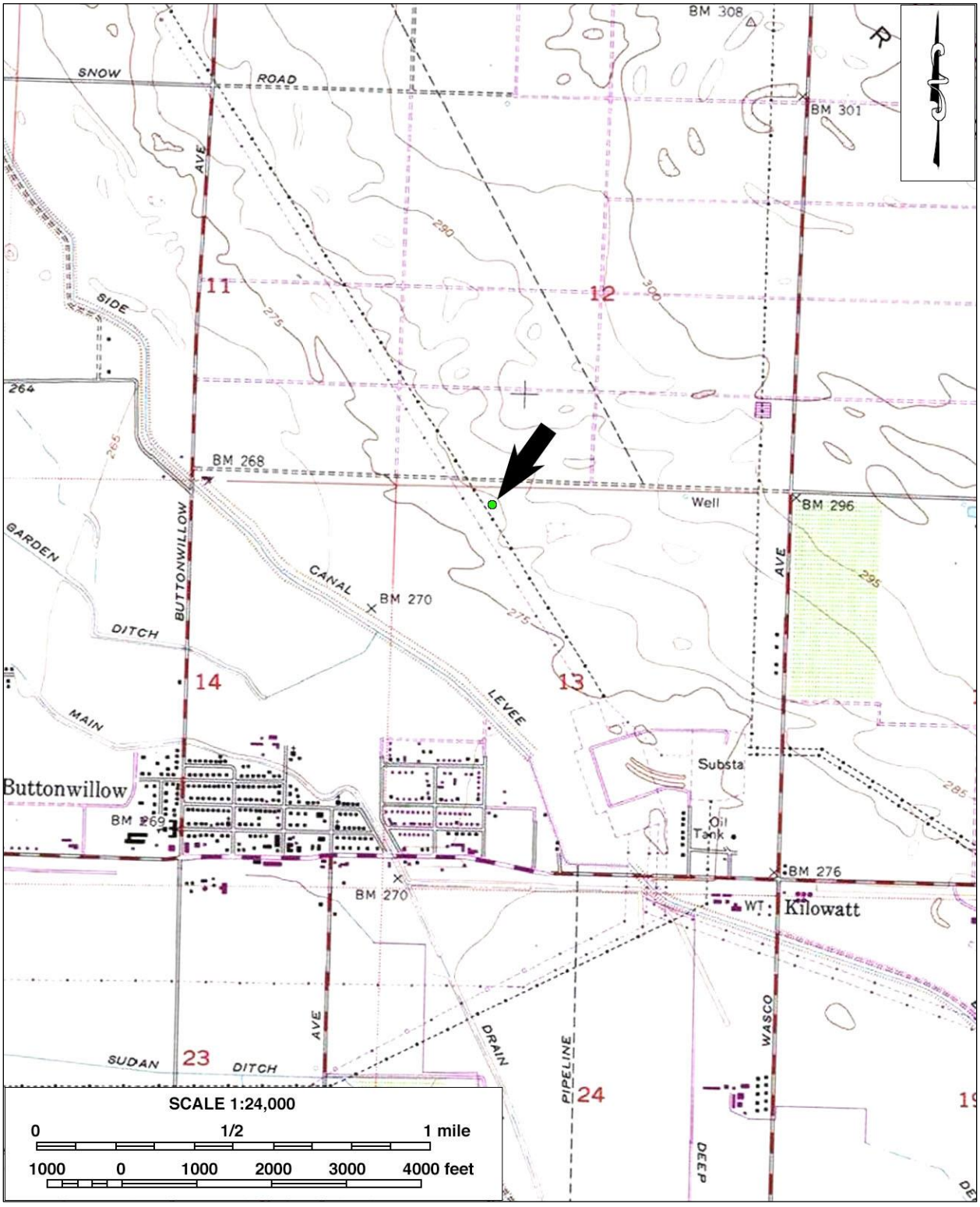
State of California--Natural Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary # _____
HRI # _____
Trinomial _____

*Resource Name or # (Assigned by recorder) CRM TECH 3856-2

*Map Name: Buttonwillow, Calif. *Scale: 1:24,000 *Date of Map: 1954/1973



*Required information

State of California--The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code 6Z
Other Listings
Review Code Reviewer Date

Page 1 of 2 *Resource Name or # (Assigned by recorder) CRM TECH 3856-3

P1. Other Identifier:

***P2. Location:** √ **Not for Publication** ___ **Unrestricted**

***a. County** Kern **and** (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad** Buttonwillow, Calif. **Date** 1954/1973
T29S; **R**23E; NE **1/4 of** NW **1/4 of Sec** 13 ; M.D. **B.M.**

c. Address N/A **City** Buttonwillow **Zip**

d. UTM: (Give more than one for large and/or linear resources) **Zone** 11 ; 276,567 **mE/** 3,921,262 **mN**
UTM Derivation: √ USGS Quad ___ GPS (NAD 83)

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, decimal degrees, etc., as appropriate) APN 101-060-12; approximately 400 meters south from Sullivan Road, near the unpaved extension of Meadow Street

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries) A single piece of mottled orange-light brown chert debitage measuring 4.2 x 2.6 x 1.8 cm, with multiple flake scars on its surface.

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects.)

***P3b.Resource Attributes:** (List attributes and codes) AP16: Other (isolated lithic flake)

***P4. Resources Present:** ☐ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☒ Other (Isolates, etc.)

P5b. Description of Photo: (view, date, accession #) May 5, 2022

***P6. Date Constructed/Age and Source:** ☐ Historic ☒ Prehistoric ☐ Both

***P7. Owner and Address:** Buttonwillow County Water District, 289 North Main Street, Buttonwillow, CA 93206

***P8. Recorded by:** (Name, affiliation, and address) Hunter O'Donnell, CRM TECH, 1016 East Cooley Drive, Suite A/B, Colton, CA 92324

***P9. Date Recorded:** May 5, 2022

***P10. Survey Type:** (Describe) Intensive-level survey for CEQA and Section 106 compliance

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.") Tang, Bai "Tom," Deirdre Encarnación, and Hunter O'Donnell (2022): Identification and Evaluation of Historic Properties: Buttonwillow County Water District Wastewater Treatment Plant Improvements Project, near the Community of Buttonwillow, Kern County, California

***Attachments:** ☐ NONE ☒ Location Map ☐ Continuation Sheet ☐ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Resource Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other (List):

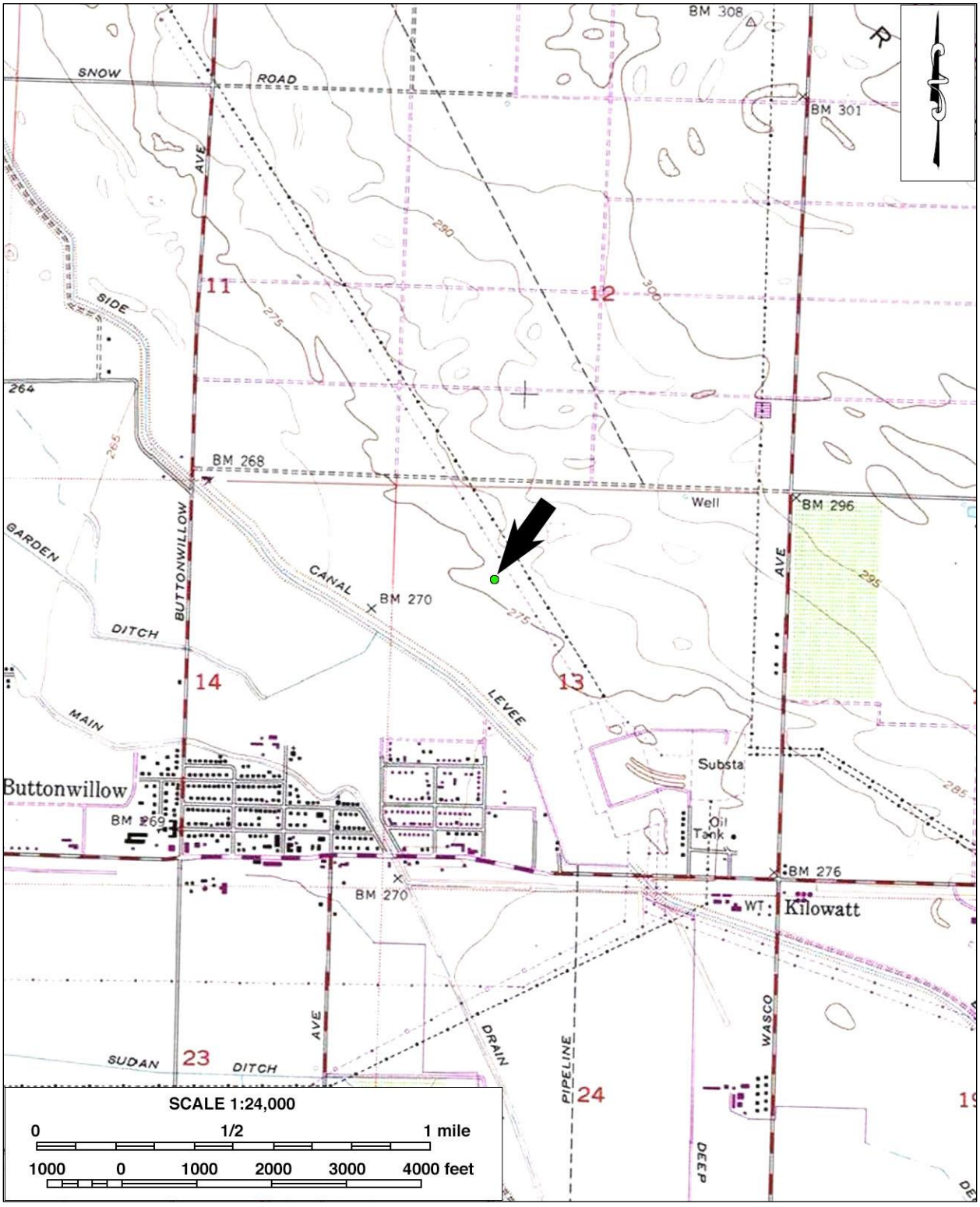
State of California--Natural Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary # _____
HRI # _____
Trinomial _____

*Resource Name or # (Assigned by recorder) CRM TECH 3856-3

*Map Name: Buttonwillow, Calif. *Scale: 1:24,000 *Date of Map: 1954/1973



State of California--The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code 6Z
Other Listings _____
Review Code _____ Reviewer _____ Date _____

*Resource Name or # (Assigned by recorder) CRM TECH 3856-4H

P1. Other Identifier: Buttonwillow Wastewater Treatment Plant (WWTP)

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** Kern

and (P2c, P2e, and P2b or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad** Buttonwillow, Calif. **Date** 1954/1973

T29S; **R**23E; NE **1/4 and** SE **1/4 of** NW **1/4 of Sec** 13 ; M.D. **B.M.**

c. Address _____ **City** Buttonwillow **Zip** 92306

d. UTM: (Give more than one for large and/or linear resources) **Zone** 11 ;
276,571 **mE/** 3,921,650 **mN** (NW corner); 276,758 **mE/** 3,921,645 **mN** (NE corner)
276,552 **mE/** 3,921,056 **mN** (SW corner); 276,741 **mE/** 3,921,050 **mN** (SE corner)
UTM Derivation: ☐ USGS Quad ☐ GIS ☒ Google Earth

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, decimal degrees, etc., as appropriate)
APN 101-020-08; on the east side of the unpaved extension of Meadow Street, approximately 0.3 miles north of the East Side Canal

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries) The Buttonwillow WWTP, the primary wastewater treatment facility for the Buttonwillow County Water District, has a permitted capacity of 0.15 million gallons per day (MGD) and a current flow of 0.091 MGD. The plant consists of both historical and modern components. The historical components include an Imhoff tank, a corrugated metal shed, a storage pond, a (*Continued on p. 5*)

***P3b. Resource Attributes:** (List attributes and codes) HP9: Public utility building

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects.)

***P4. Resources Present:** ☒ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (isolates, etc.)

P5b. Description of Photo (view, date, accession number): May 5, 2022; view to the north

***P6. Date Constructed/Age and Sources:** ☒ Historic ☐ Prehistoric ☐ Both
Circa 1956-1967; expanded and upgraded in 2010

***P7. Owner and Address:** Buttonwillow County Water District, 289 North Main Street, Buttonwillow, CA 93206

***P8. Recorded by** (Name, affiliation, & address): Hunter O'Donnell, CRM TECH, 1016 East Cooley Drive, Suite A/B, Colton, CA 92324

***P9. Date Recorded:** May 5, 2022

***P10. Survey Type** (describe): Intensive-level survey for CEQA- and Section 106-compliance

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.") Bai "Tom" Tang, Deirdre Encarnación, and Hunter O'Donnell (2022): Identification and Evaluation of Historic Properties: Buttonwillow County Water District Wastewater Treatment Plant Improvements Project, near the Community of Buttonwillow, Kern County, California

***Attachments:** ☐None ☒Location Map ☒Sketch Map ☒Continuation Sheet ☒Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Resource Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐Other (List): _____

State of California--The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary #
HRI #

BUILDING, STRUCTURE, AND OBJECT RECORD

***NRHP Status Code** 6Z

***Resource Name or #** (Assigned by recorder) CRM TECH 3856-4H

B1. Historic Name: Buttonwillow WWTP
B2. Common Name: Buttonwillow WWTP
B3. Original Use: Wastewater treatment plant
B4. Present Use: Same
***B5. Architectural Style:** N/A
***B6. Construction History:** (Construction date, alterations, and date of alterations) See Item P3a.
***B7. Moved?** √ No ___Yes ___Unknown **Date:** ____ **Original Location:**
***B8. Related Features:** Chain-link fence around the perimeter
B9a. Architect: Unknown
b. Builder: Unknown
***B10. Significance: Theme** Post-World War II utility infrastructure
Area Buttonwillow
Period of Significance 1945-1970
Property Type Public utility facility
Applicable Criteria N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.) The historical components of the Buttonwillow WWTP date to the 1950s-1960s era, but the current character of the facility is dominated by the results of substantial expansion and upgrading completed in 2010. As such, the WWTP lacks sufficient historic integrity to relate to its period of origin. Furthermore, historical background research on the WWTP has uncovered no evidence that the facility is closely associated with any persons or events of recognized historic significance.

As one of the numerous late-historic-period public utility works of standard design and configuration that remain in service throughout the U.S., the Buttonwillow WWTP does not exhibit any remarkable qualities in engineering, technology, architecture, or aesthetics, nor is it known to represent an important example of any property type, period, region, and method of construction. In addition, the plant holds little promise for important historical or archaeological data for the study of public utility works in the post-WWII era, a subject that is well documented in existing literature.

In summary, Site 3856-4H does not appear to meet any of the criteria for listing the National Register of Historic Places or the California Register of Historical Resources, nor does it retain sufficient historic integrity for such listing.

B11. Additional Resource Attributes: (List attributes and codes) HP11: Engineering structure; HP46: Wall/gate/fence
***B12. References:** See Item P11.
B13. Remarks:
***B14. Evaluator:** Bai "Tom" Tang
***Date of Evaluation:** October 14, 2022

(Sketch Map with north arrow required.)

(See p. 4)

(This space reserved for official comments.)

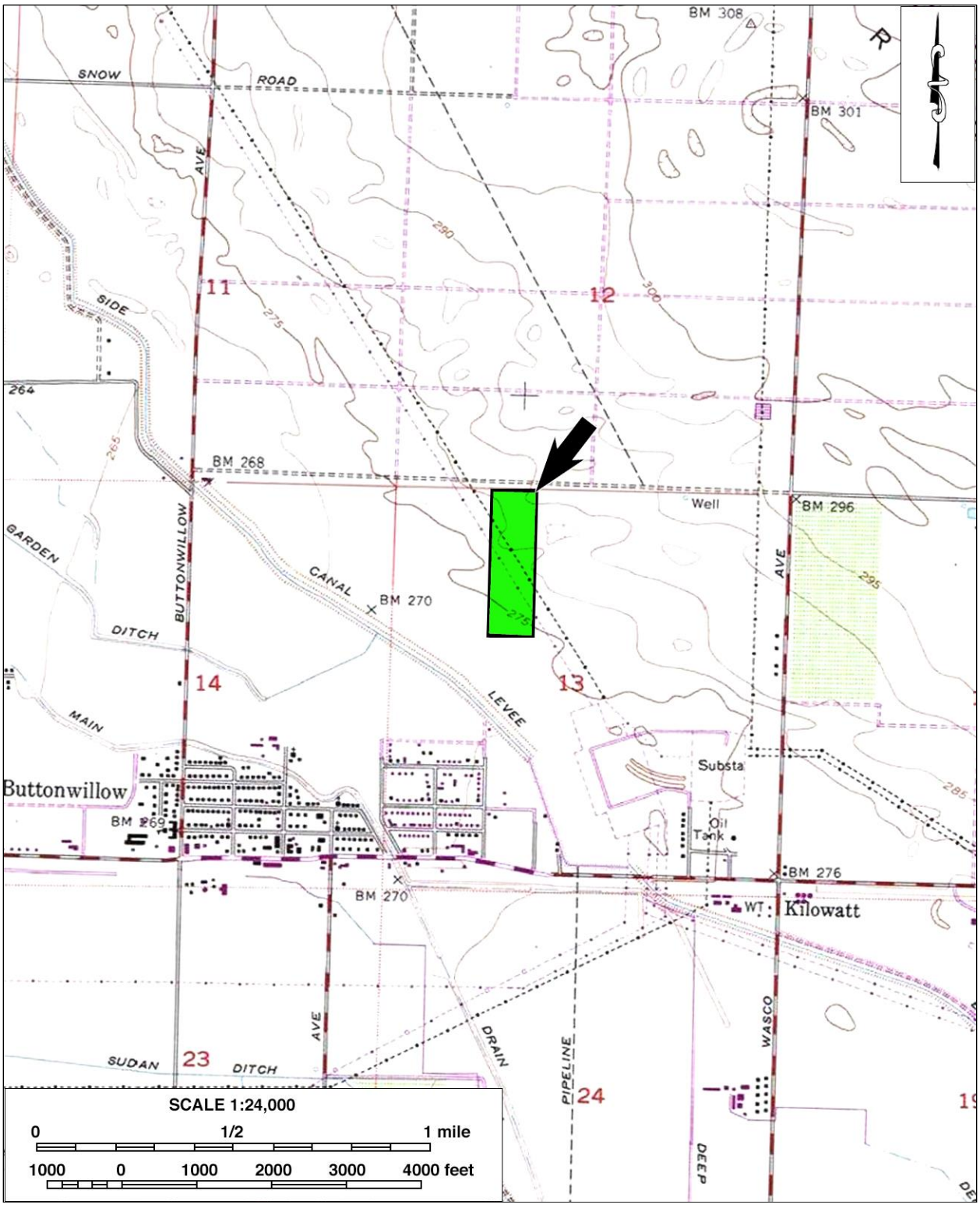
State of California--The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary # _____
HRI # _____
Trinomial _____

Page 3 of 10 *Resource Name or # (Assigned by recorder) CRM TECH 3856-4H

*Map Name: Buttonwillow, Calif. *Scale: 1:24,000 *Date of Map: 1954/1973



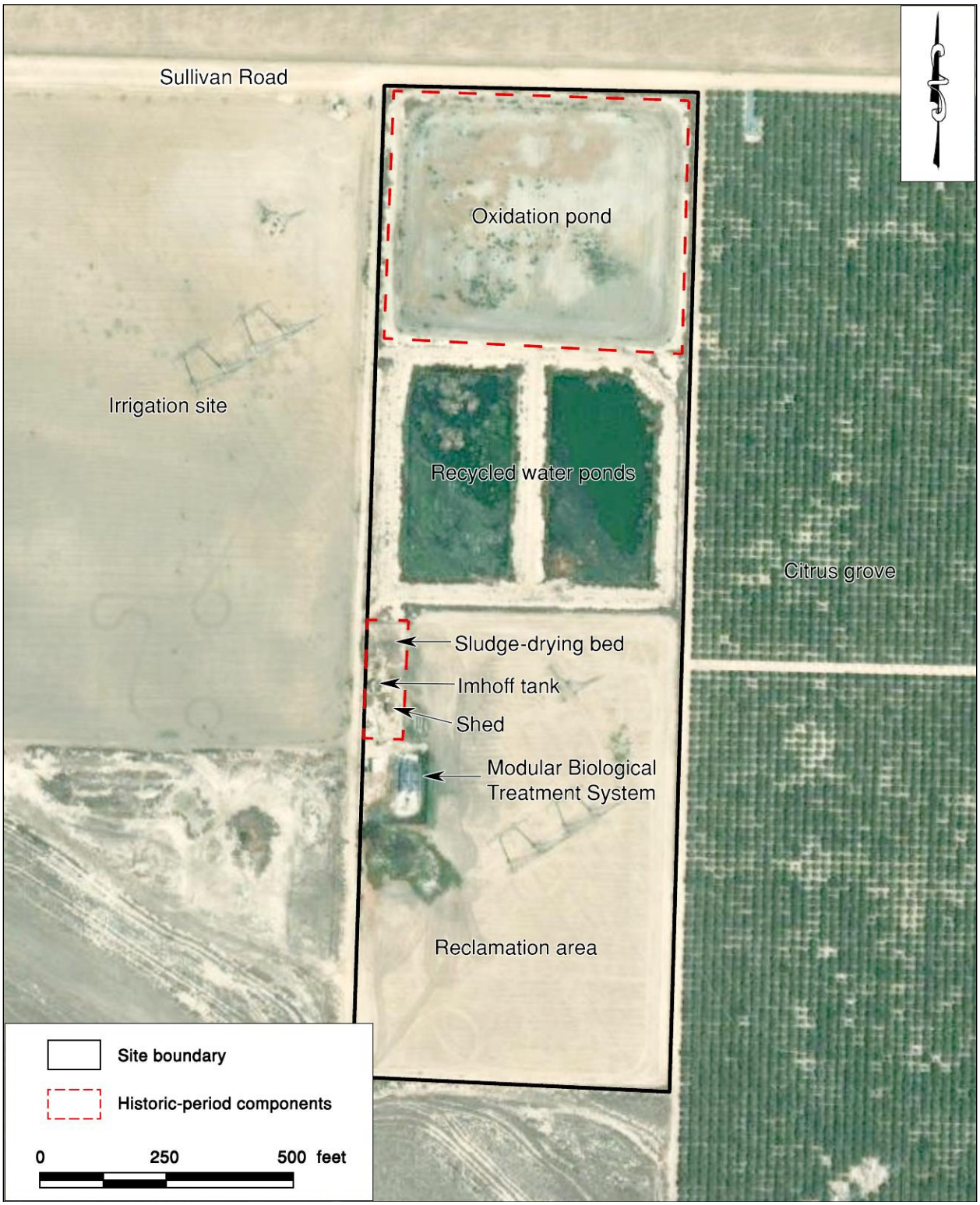
State of California--The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
SKETCH MAP

Primary #
HRI #
Trinomial

***Resource Name or #** (Assigned by recorder) CRM TECH 3856-4H

***Drawn by:** Daniel Ballester

***Date:** October 13, 2022



Recorded by: Hunter O'Donnell ***Date:** May 5, 2022 √ Continuation Update

***P3a. Description (**continued**):** sludge-drying bed, and a cluster of standpipes, all built between 1956 and 1967. The tank measures approximately 12 feet in diameter and 25 feet tall, the shed is approximately 17 feet by 16 feet, the storage pond is approximately 540 feet by 470 feet, and the sludge-drying bed is approximately 50 feet by 50 feet.

The modern components include a lift station, mechanical bar screen, two equalization tanks, two bio-tanks, two membrane tanks, two aerated sludge tanks, three concrete-lined sludge drying beds, and two 22.5-acre-foot unlined storage ponds, which were added to the facility in 2010. As is typical for public utility establishments like this, all of the structures and other features at the plant are of standard design and utilitarian character. Due to the alterations and additions since 1967, the overall appearance of the facility is predominantly modern.

Imhoff tank constructed between 1956 and 1967; view to the west

Electrical shed constructed between 1956 and 1967; view to the southwest

Standpipe cluster constructed between 1956 and 1967; view to the northwest

Sludge basin constructed between 1956 and 1967; view to the north

Pre-engineered modular biological treatment systems installed in 2010; view to the southeast

Modern shed; view to the southeast

Recorded by: Hunter O'Donnell ***Date:** May 5, 2022 √ Continuation Update

Modern 22.5-acre-foot storage pond; view to the southeast

Storage pond constructed between 1956 and 1967,
now used as an oxidation pond; view to the north

APPENDIX 5

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 11. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC–3, #9202
1315 East–West Highway
Silver Spring, MD 20910–3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713–3242,** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was derived from USDA –Farm Service Agency –Aerial Photography Field Office dated 2005 and from U.S. Geological Survey Digital Orthophoto Quadrangles produced at a scale of 1:12,000 from photography dated 1992 or later.

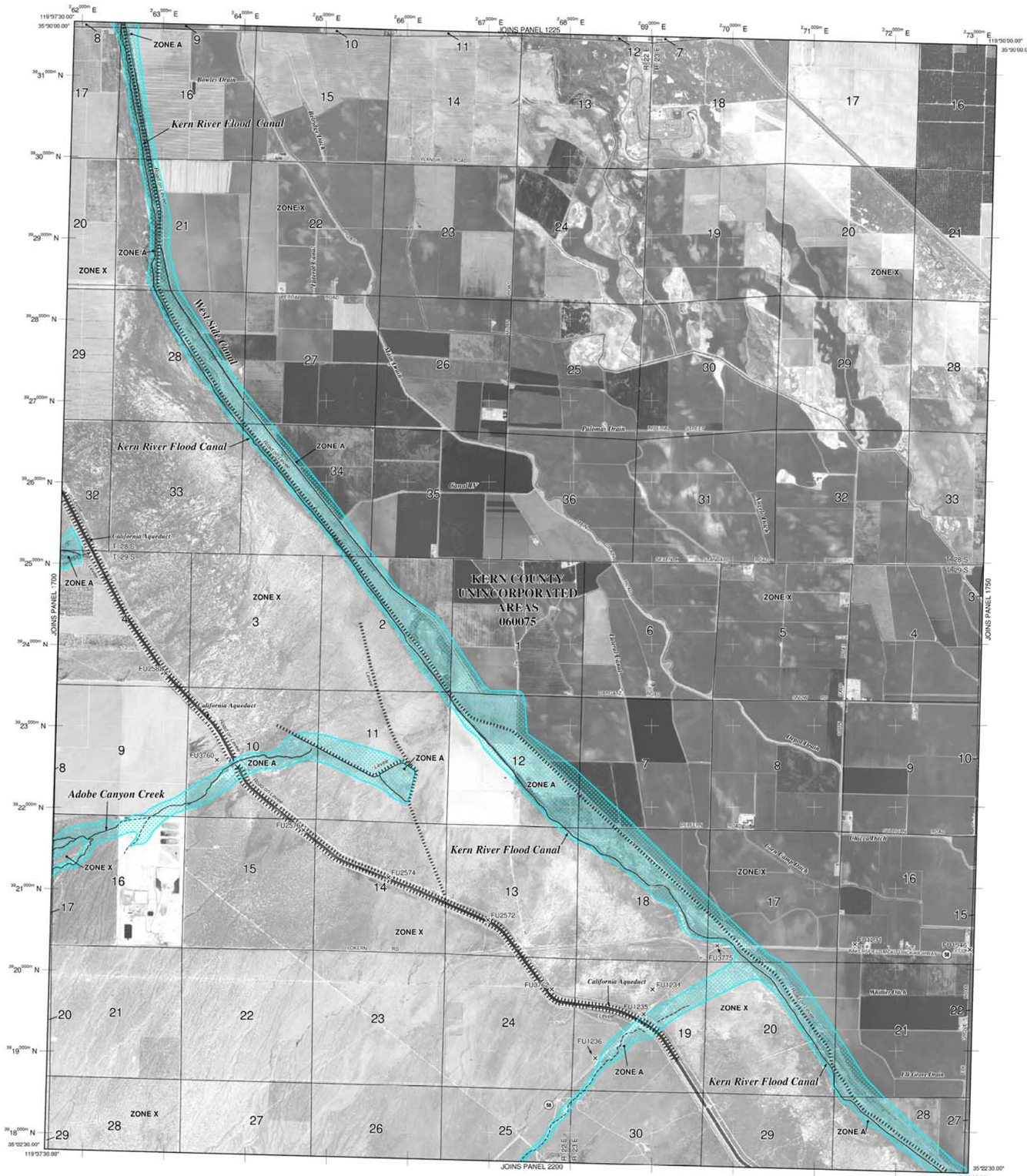
This map reflects more detailed and up–to–date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de–annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses: and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1–800–358–9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, *a Flood Insurance Study report,* and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1–800–358–9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1–877–FEMA MAP** (1–877–336–2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- A — A — Cross section line
- 23 — 23 — Transect line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4275000m N — 1000-meter Universal Transverse Mercator grid ticks, zone 11
- 6000000 M — 5000-foot grid ticks: California State Plane coordinate system, V zone (FIPSZONE 0405), Lambert Conformal Conic
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
September 26, 2008
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1–800–638–6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
600 0 600 1200 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 1725E

FIRM
FLOOD INSURANCE RATE MAP
KERN COUNTY, CALIFORNIA
AND INCORPORATED AREAS

PANEL 1725 OF 4125
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
KERN COUNTY	060075	1725	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06029C1725E

EFFECTIVE DATE
SEPTEMBER 26, 2008

Federal Emergency Management Agency