DRAFT INITIAL STUDY
MITIGATED NEGATIVE DECLARATION
for the
Greenfield Wastewater Treatment Plant Improvement Project

CITY OF GREENFIELD
CALIFORNIA

Lead Agency:

City of Greenfield
Contact: Jamie Tugel
Public Works Director

Prepared by:

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Monterey, CA 93940

April 2024

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Abbreviations

Acronym or Abbreviation	Definition
3CE	Central Coast Community Energy
AAM	Annual Arithmetic Mean
AAQS	Ambient Air Quality Standards
AB	California Assembly Bill
ADT	Average Daily Traffic
AMBAG	Association of Monterey Bay Area Governments
APE	Area of Potential Effect
APN	Assessor Parcel Number
AQMP	2012-2015 Air Quality Management Plan
ASBS	Areas of Special Biological Significance
ASGSA	Arroyo Seco Groundwater Sustainability Agency
BAU	Business as usual
BMPs	Best Management Practices
BSC	Building Standards Commission
CAAQS	California Ambient Air Quality Standards
CalEPA	California Environmental Protection Agency
CalGreen	California Green Building Standards Code
CalRecycle	California Integrated Waste Management Board
California Register	California Register of Historical Resources
CA SRF	California State Revolving Fund
CAO	Clean-Up and Abatement Order
CARB	California Air Resources Board
CBC	California Building Code
CCAA	California Clean Air Act
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CDO	Cease and Desist Order
CEC	California Energy Commission
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CGP	Construction General Permit
CGS	California Geological Survey
City	City of Greenfield
CH_4	methane

CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNG	Compressed Natural Gas
CNPPA	California Native Plant Protection Act
CNPS	California Native Plant Society
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide-Equivalent
County	Monterey County, California
CPUC	California Public Utilities Commission
CRPR	California Rare Plant Ranks
CSCA	The Central Salinas County Area Plan
CWA	Clean Water Act
dB	Decibels
dBA	A-weighted Sound Level
DD&A	Denise Duffy & Associates
DNL/LDN	Day/Night Noise Level
DOC	The California Department of Conservation
DOT	United States Department of Transportation
DTSC	Department of Toxic Substances Control
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FCAA	Federal Clean Air Act
FEMA	Federal Emergency Management Agency
FIP	Federal Implementation Plan
FIRM	Flood Insurance Rate Maps
FMMP	Farmland Mapping and Monitoring Program
FPPA	The Farmland Protection Policy Act
FOG	Fats, Oils, and Greases
GHG	Greenhouse Gas
GOPR	Governor’s Office of Planning and Research
GSP	Groundwater Sustainability Plan
HDPE	High-Density Polyethylene
HVAC	Heating, Ventilation, and Air Conditioning
Hz	Hertz
IS/MND	Initial Study/Mitigated Negative Declaration
KW	Kilowatt
KWh/year	Kilowatt Hour Per Year
L_{eq}	Equivalent Noise Level
LAFCO	Local Agency Formation Commission

LNG	Liquified Natural Gas
LOP	Local Oversight Program
LOS	Level of Service
LUST	Leaking Underground Storage Tank
Master Plan	Wastewater Treatment Plant Master Plan
MBARD	Monterey Bay Air Resource District
MBR	Membrane Bioreactor
MBTA	Migratory Bird Treaty Act
MCC	Mechanical Control Center
MGD	Million Gallons Per Day
MG/L	Milligram Per Liter
ML/L	Milliliter Per Liter
MMT	Million Metric Tons
MTOCO$_2$e	Million Tons of Carbon Dioxide Equivalent
MOU	Memorandum of Understanding
NAAQS	National Ambient Air Quality Standards
NCCAB	North Central Coast Air Basin
NAHC	Native American Heritage Commission
NEHRP	National Earthquake Hazards Reduction Program
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NHTSA	National Highway Traffic Safety Administration
NMFS	National Marine Fisheries Service
NO$_2$	Nitrogen Dioxide
NO$_x$	Nitrogen Oxides
NOAA	National Oceanic and Atmospheric Administration
NOD	Notice of Determination
NOI	Notice of Intent
NOV	Notice of Violation
NPDES	National Pollutant Discharge Elimination System
NRHP or National Register	The National Register of Historic Places
NRCS	Natural Resources Conservation Service
NWIC	Northwest Information Center at Sonoma State University
O$_3$	Ozone
OWTS	Onsite Wastewater Treatment Systems
PCBs	Polychlorinated Biphenyls
PDR	The City of Greenfield Wastewater Treatment Plant Upgrade Project Preliminary Design Report
PG&E	Pacific Gas and Electric
PM$_{2.5}$	Fine Particulate Matter
PM$_{10}$	Inhalable Particulate Matter

Proposed Project	City of Greenfield Wastewater Treatment Plant Improvement Project
PPM	Parts Per Million
RCRA	Resources Conservation and Recovery Act
ROG	Reactive Organic Gases
RPS	Renewables Portfolio Standard
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SCADA	Supervisory Control and Data Acquisition
SF	Square Foot
SFHA	Special Flood Hazard Areas
SIP	State Implementation Plan
SMARA	The Surface Mining and Reclamation Act
SMAQMD	Sacramento Metropolitan Air Quality Management District
SO_2	Sulfur Dioxide
SPCP	Spill Prevention and Control Plan
SR	State Route
SVBGSA	Salinas Valley Basin Groundwater Sustainability Agency
SWPPP	Storm Water Pollution Prevention Plan
SWRCB/Water Board	State Water Resources Control Board
TAC	Toxic Air Contaminants
TSCA	Toxic Substances Control Act
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
UV	Ultraviolet
VdB	Vibration Velocity Level
VMT	Vehicle Miles Traveled
WAS	Waste Activated Sludge
WDR	Waste Discharge Requirements
WWTP	Wastewater Treatment Plant
$\mu g/m^3$	Micrograms Per Cubic Meter

Project Summary

1. **Project Title**: City of Greenfield Wastewater Treatment Plant Improvement Project ("Proposed Project")

2. **Lead Agency:** City of Greenfield

3. **Contact:** Jamie Tugel
   Public Works Director
   jtugel@ci.greenfield.ca.us
   (831) 674 - 2635

   City of Greenfield
   920 Walnut Avenue
   P.O. Box 127
   Greenfield, CA 93927

4. **Prepared By:** Denise Duffy and Associates, Inc ("DD&A").

5. **Date Prepared:** March 2024

6. **Project Location:** City of Greenfield, Monterey County, California

7. **Name of Property Owner/Project Proponent:** City of Greenfield

8. **Project Location:** The Proposed Project is primarily located in the City of Greenfield; however, a portion of the Project site is in unincorporated Monterey County, California ("County"). The City of Greenfield is in the Salinas Valley and is 35 miles south of the City of Salinas, and 17 miles north of King City. The Proposed Project would be primarily located at the existing Wastewater Treatment Plant ("WWTP") site located on Walnut Avenue on Assessor Parcel Number ("APN") 109-031-005-000. Potable and recycled water pipelines would be constructed within the right-of-way of Walnut Avenue west towards Thorp Avenue. The Proposed Project would also construct a recycled water pump station and additional pipeline located in the existing effluent disposal site (APN 109-031-005-000). Existing agricultural fields adjacent to the WWTP would receive recycled water from the WWTP.

9. **Assessor's Parcel Number(s):** 109-031-005-000

10. **Acreage of Parcel(s):** 68.89-acres

11. **Project Description:** The Proposed Project consists of the construction of a new WWTP facility, and the subsequent demolition of the existing WWTP. Additionally, potable and recycled water pipelines would be constructed within the right-of-way of Walnut Avenue west towards Thorp Avenue. The Proposed Project would construct additional recycled water pipeline located in the access road between the WWTP and effluent disposal site; a recycled water pump station would be constructed on the existing effluent disposal site. The Proposed Project would improve utilities onsite and in portions of Walnut Avenue west towards Thorp Avenue and the access road between the WWTP and existing effluent disposal site. The Proposed Project would improve the performance of the existing

WWTP to ensure the facility can accommodate future flows, comply with current water quality standards, decrease reliance on groundwater supplies, and improve performance.

12. **General Plan Designation:** Farmlands/Rivers; Water Bodies and Farmlands

13. **Zoning District:** Public and Quasi Public and Farmland

Chapter 1. Introduction and Project Description

1.1 INTRODUCTION

The City of Greenfield ("City") prepared this Initial Study/Mitigated Negative Declaration ("IS/MND") to evaluate the potential environmental effects associated with the City of Greenfield Wastewater Treatment Plant Improvement Project, located in the City of Greenfield, in Monterey County, California. The City prepared this document in accordance with the California Environmental Quality Act ("CEQA"), Public Resources Code Section 21000 et. Seq., and the State CEQA Guidelines, California Code of Regulations ("CCR") Section 15000 et. Seq. The purpose of this IS/MND is to provide objective information regarding the environmental consequences of the Proposed Project to the decision makers considering the Project.

The City is acting as the Lead Agency pursuant to CEQA Guidelines Section 15050(a). As the Lead Agency, the City prepared this IS/MND pursuant to CEQA Guidelines Section 15063, Section 15070, and Section 15152. The City will circulate this IS/MND for agency and public review during a 30-day public review period, as required pursuant to CEQA Guidelines Section 15073. The City will consider all comments raising a substantive environmental issue under CEQA as part of the deliberative process in accordance with CEQA Guidelines Section 15074.

The City is applying for California Safe Drinking Water State Revolving Fund ("CA SRF") funding through the State Water Resources Control Board ("SWRCB") for the Proposed Project. Therefore, the Proposed Project requires a CEQA Plus review. CEQA Plus incorporates federal National Environmental Policy Act ("NEPA") cross-cutting environmental regulations in addition to the standard CEQA requirements. The Proposed Project must, therefore, comply with the following federal environmental laws: Endangered Species Act; Magnuson-Stevens Fishery Conservation and Management Act, National Historic Preservation Act; Clean Air Act; Clean Water Act; Wetland Protection Executive Order 11990; Farmland Protection Policy Act; Coastal Zone Management Act; Coastal Barriers Resources Act, Wild and Scenic Rivers Act; Floodplain Management EO 11988; Migratory Bird Treaty Act, Safe Drinking Water Act, and applicable Environmental Justice regulations.

Publication of this IS/MND marks the beginning of a 30-day public review and comment period. During this period, the IS/MND will be available to local, state, and federal agencies and to interested organizations and individuals for review. Written comments concerning the environmental review contained in this IS/MND during the 30-day public review period should be sent to:

City of Greenfield
599 El Camino Road
Greenfield, CA 93927
Attn: Jamie Tugel, Public Works Director

This IS/MND and all documents referenced in it are available for public review at the Department of Public Works at the above address. Following the conclusion of the public review period, the City will consider the adoption of the IS/MND for the Project at a regularly scheduled public hearing. The City shall consider the IS/MND together with any comments received during the public review process. Upon adoption of the IS/MND, the City may proceed with Project approval actions. If the City approves the Project, the City will file a Notice of Determination ("NOD"), which will be available for public inspection and posted in 24 hours of receipt at the County Clerk's Office for 30 days. The filing of the NOD starts a 30-day statute of limitations on court challenges to the approval under CEQA (CEQA Guidelines Section 15075(g)).

The City prepared the following section consistent with the requirements of CEQA Guidelines Section 15124 to the extent that it applies to the Project. Additionally, the information contained in this section has also been prepared to satisfy the applicable CEQA Plus requirements. This section contains a detailed description of the Project background, including current use of the Project site, Project components, and relevant Project characteristics.

1.2 BACKGROUND

The City owns and operates an existing WWTP. The WWTP was originally constructed in the 1950's and over the course of several decades has been upgraded and expanded to receive, treat, and dispose of municipal wastewater (City of Greenfield and Carollo Engineers, 2021). Currently, the WWTP is designed and permitted to receive two (2.0) million gallons per day ("mgd") of wastewater, and serves a population of 18,937 (HydroScience, 2023, and RWQCB, 2022). Wastewater is collected through approximately 21 miles of collection system pipelines, and six (6) sewer lift stations (Ibid.) The existing WWTP consists of a headworks, primary clarifiers, secondary biological treatment provided by aerated ponds, and effluent disposal provided by percolation ponds and disposal fields (Wallace, 2018).

In 2017, the City made improvements to the aeration ponds to reliably allow for the treatment of two (2) mgd of wastewater. However, the effluent disposal site illustrated signs of overloading due to compromised percolation rates, which suggested the existing disposal fields could not adequately serve the existing and future disposal capacity of the WWTP (Ibid). In 2018, the disposal field berm failed. As a result, effluent spilled onto adjacent City-owned property and caused the Regional Water Quality Control Board ("RWQCB") Central Coast Region to issue a Notice of Violation ("NOV"). As part of the NOV, the RWQCB required that the City prepare a Compliance Workplan to:

- Evaluate the cause(s) of the disposal system failures;
- Develop a plan to prevent such failures from occurring again;
- Detail a schedule of specific actions that the City will take to correct and prevent future violations;
- Summarize wastewater treatment plant design parameters and disposal system capacity; and
- Discuss treatment plant and disposal system performance leading up to and during ponding (of effluent) violations.

To comply with the NOV, the City contracted the Wallace Group. The Wallace Group prepared a detailed workplan entitled *Effluent Disposal Study and Compliance Work Plan in Response to Notice of Violation (2018)* to address the NOV. The Wallace Group identified that the percolation capacity had been significantly diminished due to clogging of the upper soil layer from discharged solids. To meet the discharge quality requirements, Wallace Group recommended de-servicing the disposal fields (drying, ripping, and disking) to prepare them for restoration, acquiring additional land for expanded effluent disposal, and developing a facilities management plan to address long-range wastewater needs. Since the publication of the Wallace Group report, the City has implemented a number of recommendations to improve operational efficiency of the existing WWTP and effluent disposal fields.

Since the development of the *Effluent Disposal Capacity Study and Workplan*, the City retained Carollo Engineers, Inc. to develop a WWTP Master Plan to identify performance and capacity constraints at the existing WWTP. The Master Plan also identified measures to comply with current and future regulatory requirements related to the operation of the WWTP. In 2020, the RWQCB adopted updated General Waste Discharge Requirements ("WDR").[1] The WDR permits the WWTP to treat an average monthly design flow of 1.5 mgd, and a maximum day flow of 2.0 mgd. Additionally, the WDR sets effluent limitations based on the type of treatment technology in use at the plant.[2] As previously mentioned, the WWTP utilizes effluent disposal ponds or "treatment ponds," **Table 1.2-1** illustrates the effluent limitations for the plant.

Table 1.2-1. Effluent Limitations: Treatment Ponds (in 24 months)

Constituent	Units	30-Day Average	7-Day Average	Sample Maximum
Biochemical Oxygen Demand, 5-Day	mg/L[1]	45	65	Not Applicable
Total Suspended Solids	mg/L	45	65	Not Applicable
Settleable Solids	mg/L[2]	0.3	Not Applicable	0.5
pH	pH units	Between 6.5 and 8.4	Not Applicable	Not Applicable

Notes:
[1] mg/L denotes milligram per liter.
[2] mL/L denotes milliliter per liter.
Source: RWQCB, 2022. Waste Discharge Requirement. Order No. R3-2002-0062. HydroScience, 2023. *City of Greenfield Wastewater Treatment Plant Upgrade Project Preliminary Design Report.*

Additionally, effluent limitations are set based on the underlying groundwater basin. The WWTP is located in the Salinas Valley Lower Forebay Basin. **Table 1.2-2** identifies applicable effluent limitations in the Salinas Valley Lower Forebay Basin.

Table 1.2-2. Effluent limitations
Based on – Salinas Valley Lower Forebay Objectives

Constituents	Units	25-Month Rolling Median
Total Dissolved Solids	mg/L[1]	1500
Chloride	mg/L	250
Sodium	mg/L	Not Applicable[2]
Sulfate	mg/L	850
Boron	mg/L	Not Applicable[2]
Total Nitrogen	mg/L	Not Applicable[2]

Notes:
[1] mg/L denotes milligram per liter.
[2] Groundwater monitoring is required for these constituents to demonstrate compliance with groundwater limitations.
Source: RWQCB, 2022. Waste Discharge Requirement. Order No. R3-2002-0062. HydroScience, 2023. *City of Greenfield Wastewater Treatment Plant Upgrade Project Preliminary Design Report*

As currently constructed, the existing WWTP is not able to achieve these effluent limitations with the existing treatment process. The WWTP is not designed to remove nitrogen and provides only secondary treatment of wastewater.

In May 2021, the City adopted a *Wastewater Treatment Plant Master Plan* ("Master Plan"). The Master Plan addresses the need for expanded facilities to support future development and population growth in the City and identifies new requirements from the RWQCB. Based on the 2021 Master Plan, the City

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[1] Wastewater discharged by the City is regulated by General Waste Discharge Requirements Order No. R3-2020-0020 for Discharges from Domestic Wastewater Systems with Flows Greater than 100,000 gallons per day.

[2] Additional effluent limitations exist based on the groundwater basin, and organic loading of the rapid infiltration basins.

requested that the Wallace Group separately review treatment and effluent disposal alternatives available to the City and recommended the City construct and operate a prepackaged membrane bioreactor (“MBR”) and recycled water distribution system. The Proposed Project, as more thoroughly described below, would implement several of the recommendations identified in the Master Plan, including use of recycled water on adjacent agricultural parcels, and renovating facilities to increase operational efficiency and comply with the RWQCB’s WDR.

1.3 PROJECT LOCATION

The City of Greenfield is in the Salinas Valley and is 35 miles south of the City of Salinas, and 17 miles north of King City (see **Figure 1**). The Proposed Project is primarily located in the City of Greenfield; however, a portion of the Project site is in unincorporated Monterey County, California (see **Figure 2**). The new WWTP would be located at the existing WWTP site located on Walnut Avenue on Accessor Parcel Number (“APN”) 109-031-005-000. Potable and recycled water pipeline would be constructed within the right-of-way of Walnut Avenue west towards Thorp Avenue. Additional recycled water pipeline located within the access road between the WWTP and effluent disposal site, and a recycled water pump station would be constructed in the existing effluent disposal site (APN 109-031-005-000). Existing agricultural fields adjacent to the WWTP would receive recycled water from the WWTP; a map of these agricultural areas is shown in **Figure 7**.

1.4 SURROUNDING LAND USES

The Proposed Project site is approximately two (2) miles northeast of the center of the City. The Proposed Project would construct and operate infrastructure located primarily in the jurisdiction of the City. Potable and recycled pipeline within the right-of-way of Walnut Avenue east of 2nd Street would be within unincorporated Monterey County; as would the use of recycled water would be on agricultural parcels. The City designates the portion of the Proposed Project site within their jurisdiction as *Public Quasi Public* (see **Figure 3**). The agricultural parcels within unincorporated Monterey County are designated *Farmland*. The land to the north, east, and south of the Proposed Project is in unincorporated Monterey County and these areas are designated as *Farmland* by the County. The Salinas River is east of the Proposed Project site. The remainder of the City of Greenfield is located west of the Proposed Project site.

1.5 EXISTING FACILITIES

The existing WWTP consists of approximately 21 miles of collection system pipelines with diameters ranging from four (4) to 24 inches and six (6) sewer lift stations. The existing WWTP consists of a headworks, an aerobic digester for primary sludge treatment, sludge drying beds for drying of digested sludge, three (3) primary clarifiers for primary treatment, three (3) aerated ponds for secondary treatment, and rapid infiltration basins for effluent disposal (City of Greenfield and Carollo Engineers, 2021). **Figure 4** illustrates the existing facilities. Other facilities associated with the WWTP include an onsite non-potable well and two (2) stormwater basins. Three (3) employees operate the existing facility. The *City of Greenfield Wastewater Treatment Plant Upgrade Project Preliminary Design Report* (“PDR”) prepared by HydroScience Engineers (HydroScience, 2023) provides a detailed description of existing facilities. For more information concerning existing facilities, please refer to that report.[3]

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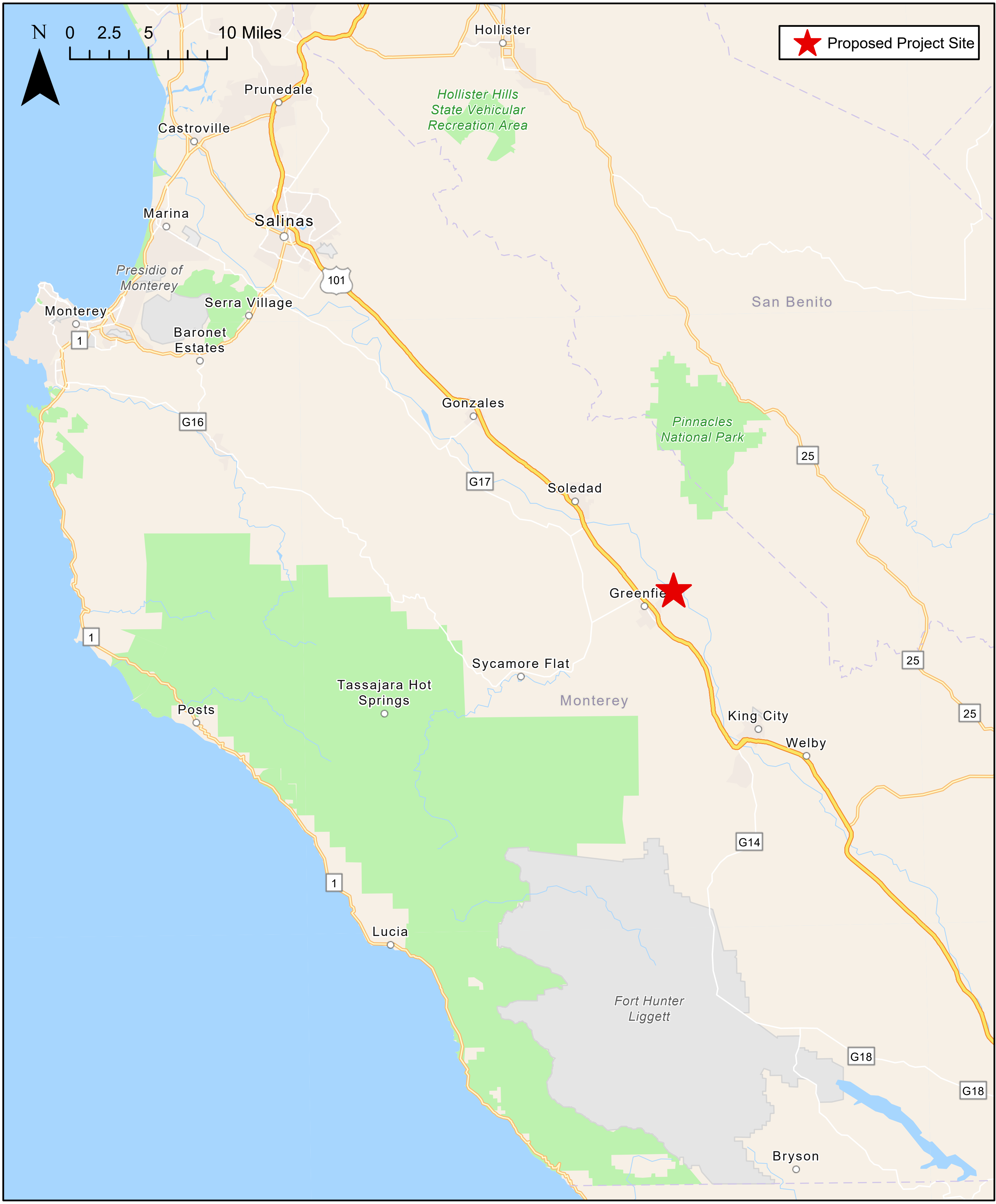
[3] Consistent with CEQA Guidelines Section 15150, the City of Greenfield Wastewater Treatment Plant Upgrade and Project Preliminary Design Report is incorporated by reference. The Preliminary Design Report is available for public review at: City of Greenfield Wastewater Treatment Plant Improvement Project | Greenfield, CA



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Regional Map	Date 2/14/2024 Scale 1 in = 8 miles	DENISE DUFFY & ASSOCIATES, INC. Planning and Environmental Consulting	Figure 1

Vicinity Map

Date
11/3/2023

Scale
1 in = 0.4 mi

DENISE DUFFY & ASSOCIATES, INC.
Planning and Environmental Consulting

Figure
2

Note: Please refer to Figure 7, which illustrates the adjacent agricultural fields that will receive recycled water in the future.

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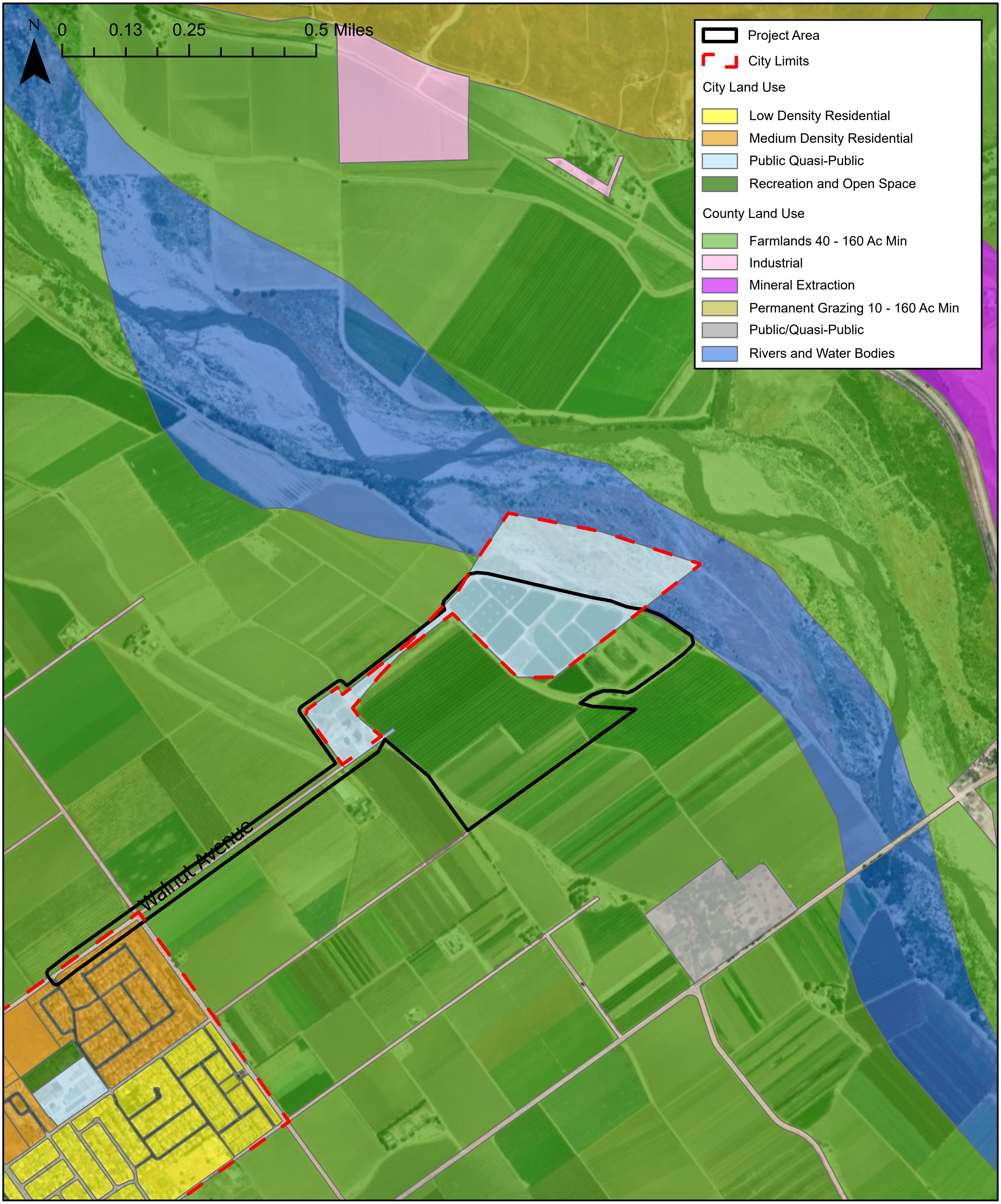

Land Use Map

Date
4/2/2024

Scale
N/A

DENISE DUFFY & ASSOCIATES, INC.
Planning and Environmental Consulting

Figure
3

Source: HydroScience. September 2023. Wastewater Upgrade Project Preliminary Design Report.

Existing Facilites

Date
04/02/2024

Scale
N/A

Denise Duffy & Associates, Inc.
PLANNING AND ENVIRONMENTAL CONSULTING

Figure
4

1.6 PROPOSED PROJECT

The Proposed Project would improve the performance of the existing WWTP to ensure the facility can accommodate future flows and comply with current water quality standards. The Proposed Project consists of improvements to the existing WWTP, and installation of recycled water infrastructure as recommended by the Wallace Group and the Master Plan, and detailed in the PDR (**Figure 5 – 5d**). The following discussion includes a description of each component of the Proposed Project as described in the PDR.

Wastewater Treatment Plant

The Proposed Project would include the construction of a new WWTP (see **Figure 5a–5d**) and the subsequent demolition of the existing WWTP (see **Figure 6a-6b**).[4] The new WWTP would consist of the following:

- Prefabricated Membrane Bioreactor Treatment Plant ("MBR")
- Equalization basin
- Pumpstation and hydro-pneumatic tank
- Effluent pump station
- Ultraviolet ("UV") disinfection system
- Fine Screen platform
- Plant water return pump station
- Influent pump station
- Electrical service transformer
- Dual packaged sludge dewatering system
- Storm water retention basin
- Dual coarse screen
- Parshall flume
- Vortex grit system
- Plant drain pump station
- Equipment storage/parking
- Equipment wash down area
- Retaining wall
- Standby generator
- 2,268 square foot electrical/chemical building
- 1,871 square foot maintenance/storage building
- 3,233 square foot administrative/operation building

A brief description of the primary WWTP components is provided below. For more information, please refer to the PDR.

Headworks

The Proposed Project includes the construction of new headworks involving coarse screening, a vortex grit chamber with fats, oils, and grease ("FOG") removal, and a parshall flume. The screening facility will include a fully redundant coarse screen, with each screen sized to treat the maximum instantaneous flow expected through the WWTP maximum flow of 6 mgd. The screenings removed will be washed and compacted and then deposited into a roll-off bin for disposal off-site.

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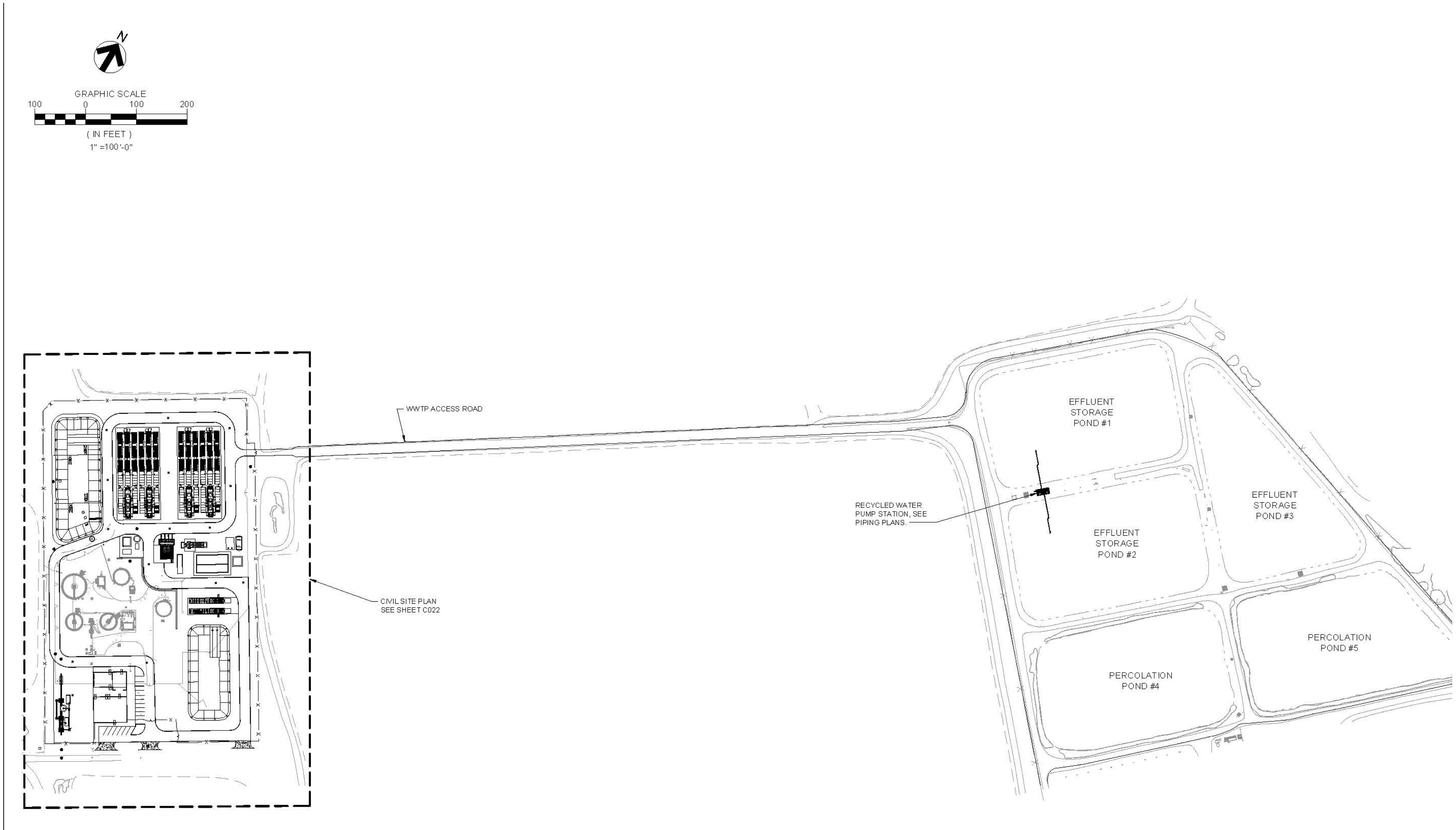
[4] As discussed in Section 2.7 Construction, the goal of Project construction is for all the existing WWTP to continue to operate while the new WWTP is constructed.



OVERALL CIVIL SITE PLAN

NOT FOR CONSTRUCTIO

Source: HydroScience. June 2023. Wastewater Upgrade Project Preliminary Design Report.

Proposed Project Site Plan

Date
11/03/2023

Scale
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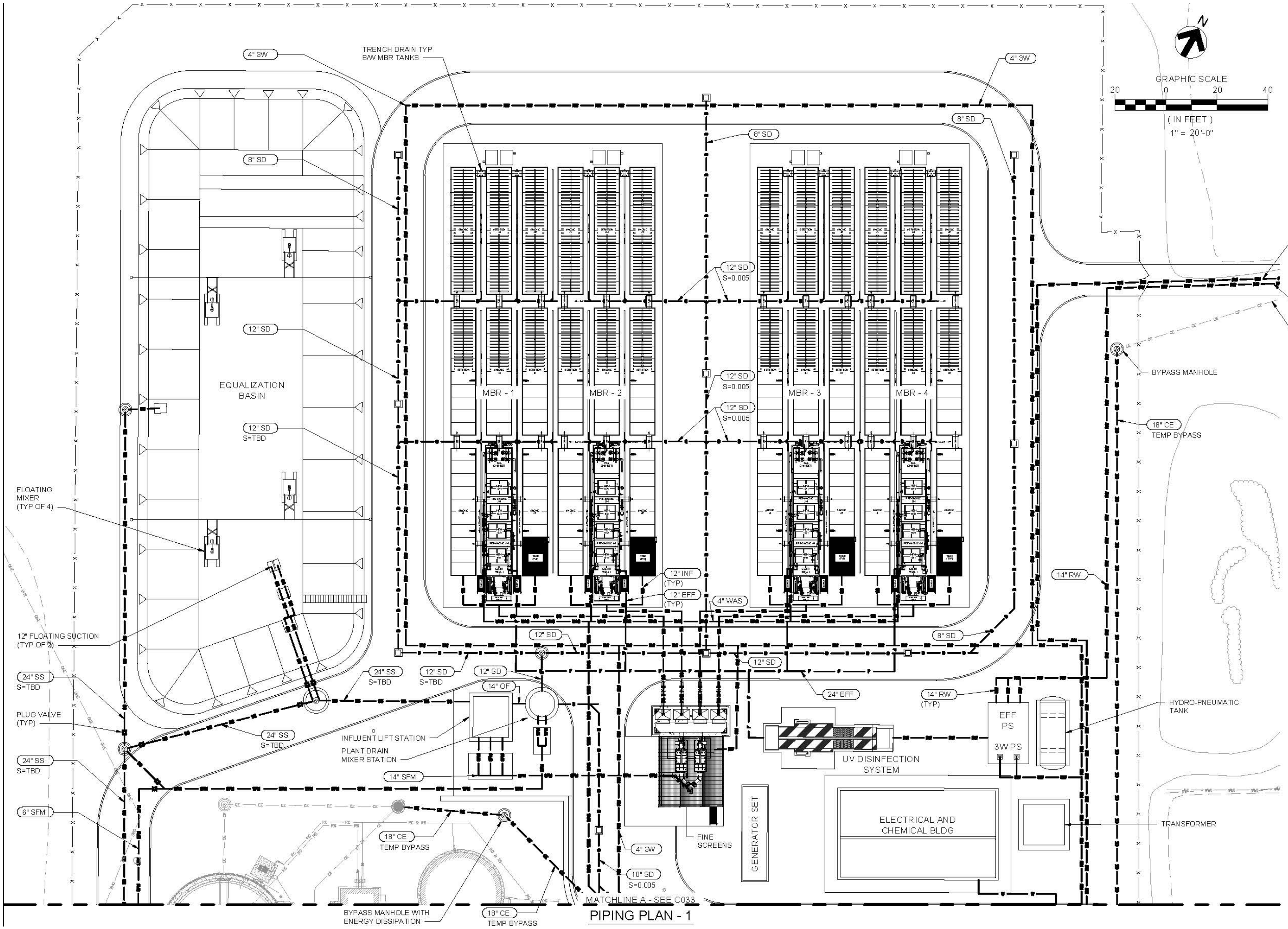
Figure
5a



Source: HydroScience. June 2023. Wastewater Upgrade Project Preliminary Design Report.

Proposed Project Piping Plan

Date
11/03/2023

Scale
N/A

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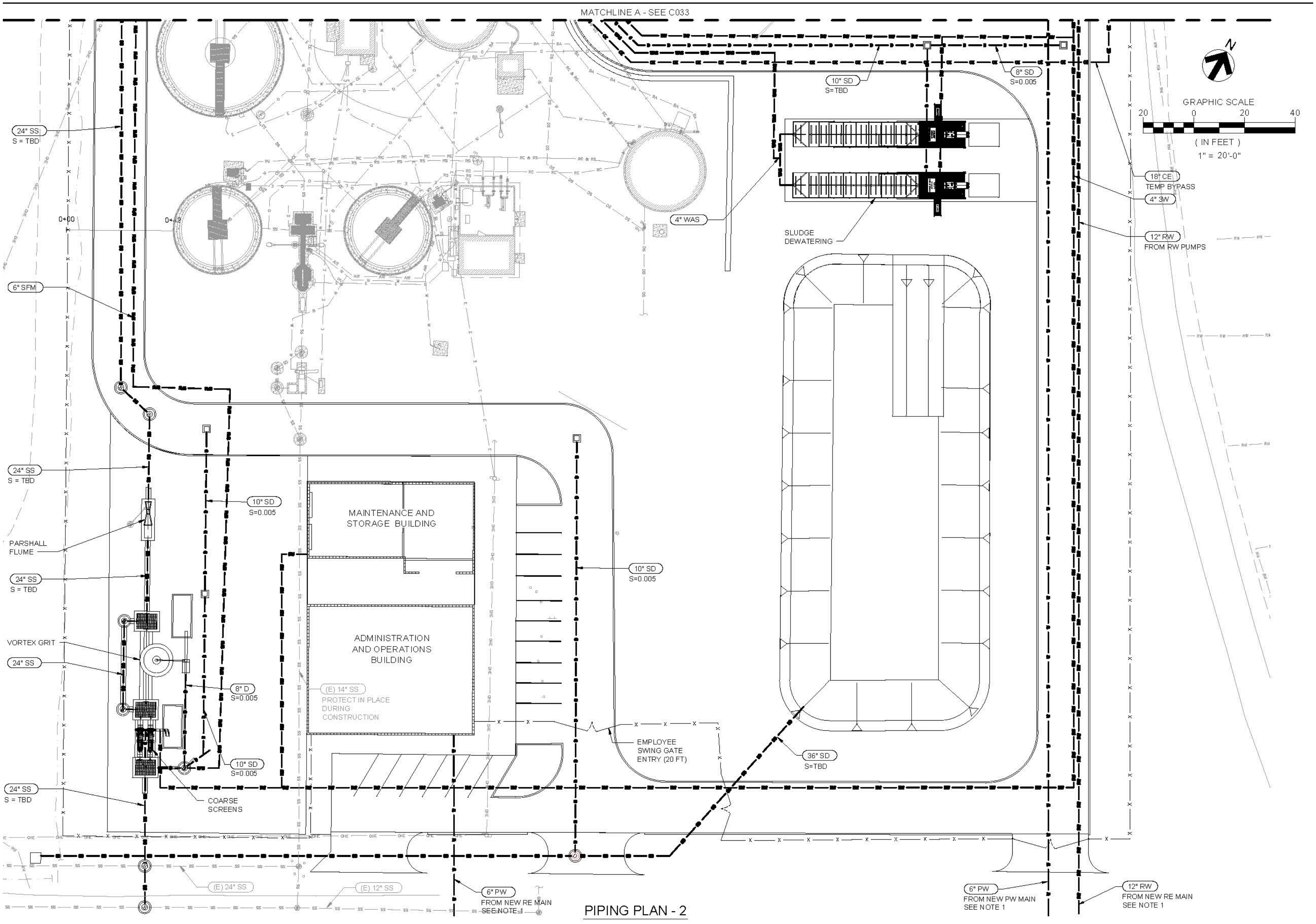
Figure
5b



Source: HydroScience. June 2023. Wastewater Upgrade Project Preliminary Design Report.

Proposed Project Piping Plan

Date
11/03/2023

Scale
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Denise Duffy & Associates, Inc.
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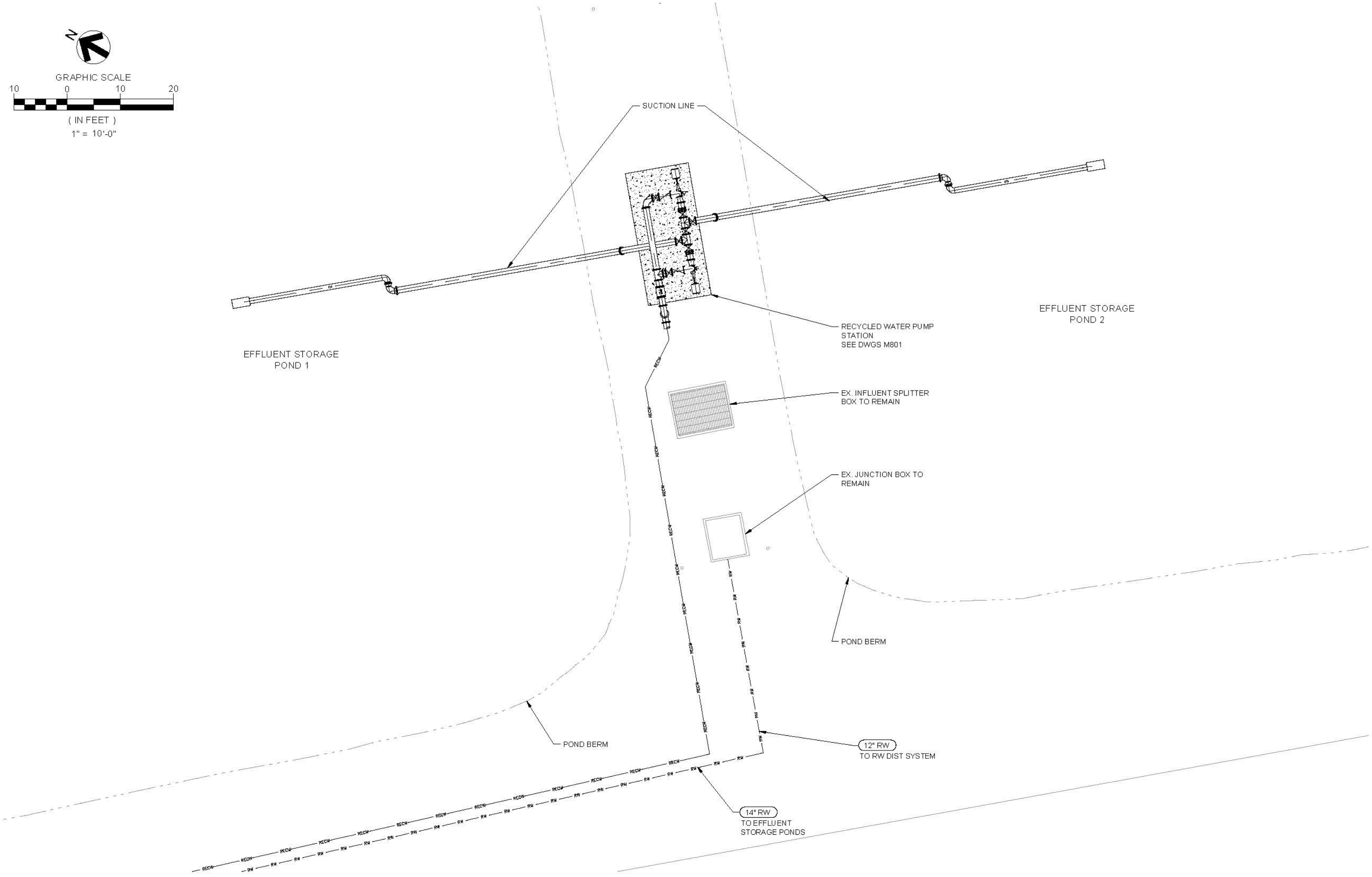
Figure
5c



RECYCLED WATER PUMP STATION PIPING PLAN

Source: HydroScience. June 2023. Wastewater Upgrade Project Preliminary Design Report.

Proposed Project Piping Plan

Date
11/03/2023

Scale
N/A

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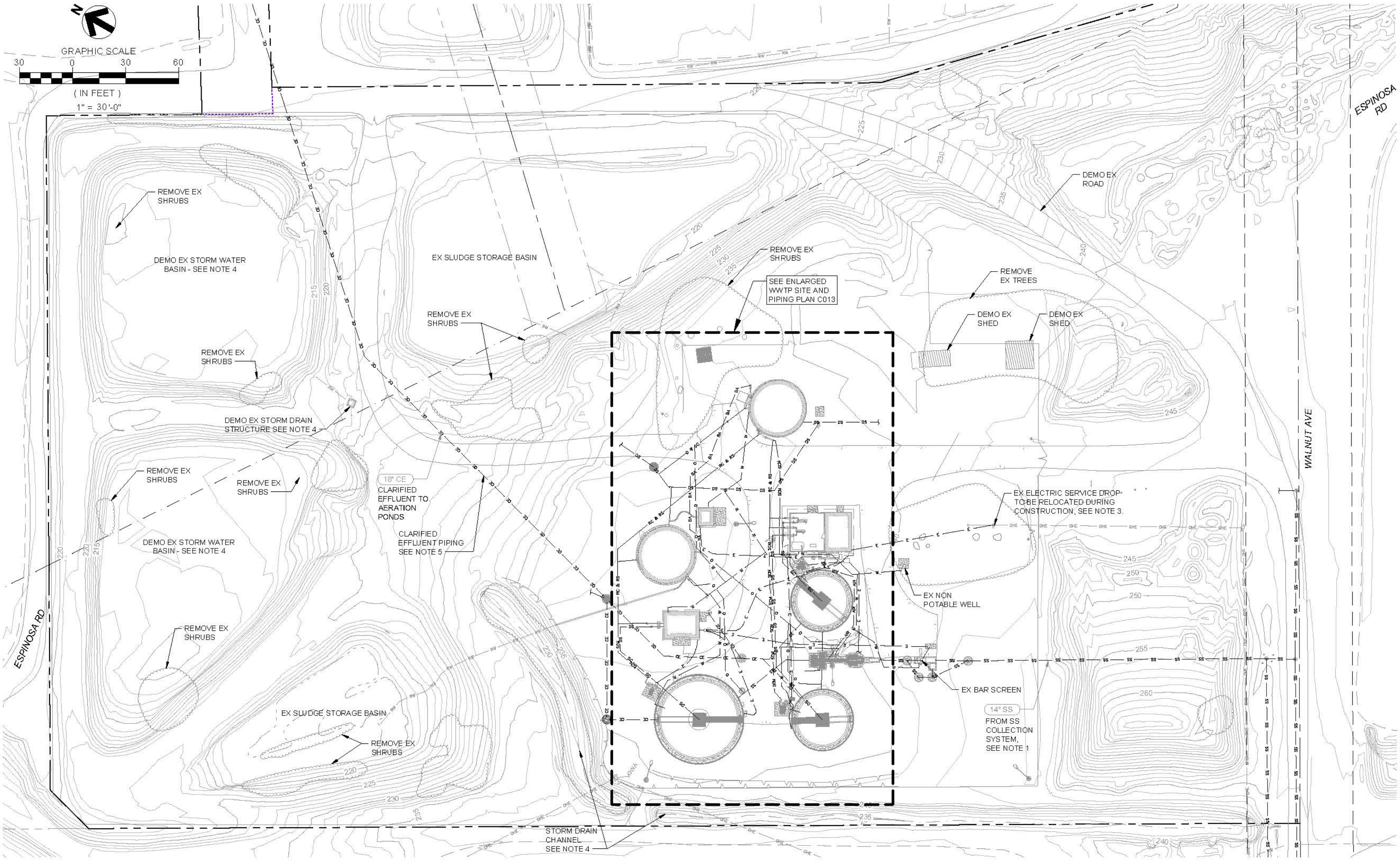
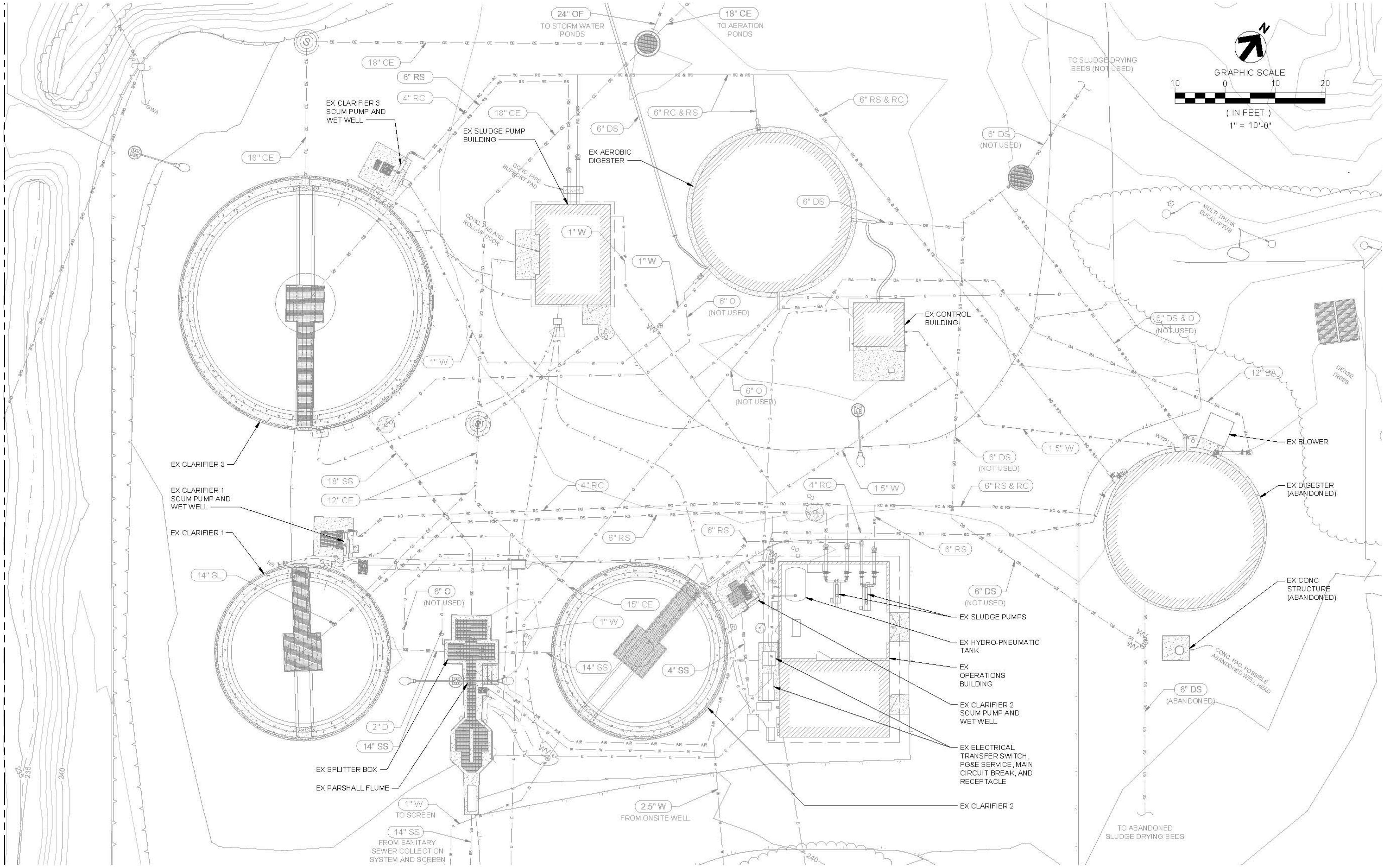
Figure
5d



EXISTING WWTP SITE, PIPING AND DEMOLITION PLAN

Source: HydroScience. June 2023. Wastewater Upgrade Project Preliminary Design Report.

Existing Site Demolition Plan	Date 11/03/2023 Scale N/A	**Denise Duffy & Associates, Inc.** PLANNING AND ENVIRONMENTAL CONSULTING	Figure 6a



ENLARGED WWTP SITE AND PIPING PLAN

Source: HydroScience. June 2023. Wastewater Upgrade Project Preliminary Design Report.

Existing Site Demolition Plan

Date
11/03/2023

Scale
N/A

DD&A

Denise Duffy & Associates, Inc.

PLANNING AND ENVIRONMENTAL CONSULTING

Figure
6b

Grit and FOG will be removed in a vortex grit chamber. Located inside of a rectangular concrete tank, influent flows in a vortex flow pattern through the chamber, which causes grit to settle out in the grit chamber. At the top of the vortex grit chamber, a FOG removal system will use a scum skimmer trough and scum sprayers to collect FOG which will overflow into the trough. The FOG is dewatered prior to disposal in a small rotary fine screen.

Equalization Basin

Flow from the headworks will flow by gravity into a new into a lined influent equalization basin. The liner material is made of an impermeable High-Density Polyethylene ("HDPE") liner to retain influent in the pond. The equalization basin would have a surface area of approximately 12,640 square feet, a depth of 10 feet, and can hold 940,000 gallons. The equalization basin would include surface mixers and direct drive surface mixers to reduce odors associated with the screened influent.

Influent Pump Station

The influent pump station will pump influent from the equalization basin to the fine screens. Flow will enter the pipe leading to the pump station through a floating suction, which will rise and lower based on water level in the pond. The wet well will be a 14 feet by 16 feet cast-in-place concrete structure sized to fit the triplex submersible pump configuration. The capacity of the influent pump station will be four (4) mgd.

Fine Screens and Splitter Box

To protect the membranes in the MBR treatment process, the Proposed Project includes the construction of an incline rotary drum screen with 2-mm screen openings. Each screen would be sized for peak biological flow to the MBR. The fine screens will be located on an elevated steel platform to allow gravity flow into the MBR splitter box downstream of the screens. Each screen will be mounted in a separate stainless-steel tank provided by the screen manufacturer. Flanged connections in the tanks will connect the upstream and downstream ends to the influent pump station force main and the MBR splitter box feed pipe, respectively.

Downstream of the fine screens, four (4) adjustable overflow weirs will regulate flow to each of the four MBR trains. Downstream of the weirs, four (4) separate pipelines will route flow to the MBR trains that are in service. This pipeline will have a low point when it crosses the roadway; a drain connection will be included to allow the operator to drain this line when not in use or for maintenance purposes.

Primary, Secondary, Tertiary Filtration

A prepackaged MBR treatment plant would be installed and include a biological nutrient removal system consisting of anoxic and aeration tanks, membranes immersed in membrane tanks, permeate pumps, recirculation systems, blowers, waste-activated sludge ("WAS") pumps, and electrical instrumentation.

Packaged treatment plants are proprietary systems manufactured to be fully functional, compact, and ready for production of tertiary effluent from plant influent upon delivery. These systems are specifically engineered to meet the volumetric requirements of the biological process and come fully equipped with tanks, mechanical equipment and piping, electrical systems, controls, pumps, handrails, catwalks, and staircases. Packaged treatment systems are factory-assembled systems that are semi-customizable based upon the influent flow and loading parameters and limited by the spatial constraints of delivery vehicles.

The final configuration of the MBR would be based on the manufacturer specifications, which would be identified during the selection and procurement process.

UV Disinfection

Permeate from the MBR would be disinfected using a UV disinfection process. UV disinfection would be designed using low pressure high intensity lamps in an open channel system. UV disinfection would be designed to produce disinfected tertiary recycled water, which would meet Title 22 requirements for unrestricted reuse. The system would include an inlet distribution box, two UV disinfection open channels, and an outlet channel where the effluent pump station (discussed below) would be located. The system would also include a shade canopy.

Effluent Pump Station

The new effluent pump station would be located downstream of the UV disinfection system and would include three (3) submersible pumps that would pump effluent to the existing aerated ponds. The new effluent pump station would be approximately 10.8 feet deep, 16 feet long, and 14 feet wide.

3W Pump Station

The 3W pump station would supply water to the WWTP that could be used for washdown, cleaning, and other non-potable uses. The 3W pump station would be located in the wet well housing the effluent pump station.

Solids Handling

A byproduct of treated wastewater is WAS. Dewatering of WAS would be performed using a screw press. The screw press would come as a prepackaged unit consisting of sludge storage tanks with an aeration system, polymer dosing systems, sludge feed pumps, volute dewater screw presses, and controls mounted on an above-ground stainless steel skid mounted platform. Dewatered sludge would be collected in roll-away containers and hauled to a landfill for disposal..

Operation and Maintenance Buildings

Three (3) new buildings would be constructed and include: a 3,233 square foot (“sf”) administrative/operations building, an 1,871-sf maintenance/storage building, and a 2,268-sf electrical/chemical building. The administrative building would provide a separate lobby with a single ADA compliant restroom, reception area with a greeting counter, and private office and conference space. This building would also contain a laboratory and the controls for the WWTP. The maintenance building would provide a workshop for servicing equipment, storage of tools, locker rooms and restroom, and an office space.

The electrical building would house the plants’ mechanical equipment and a chemical room. The electrical room will house the mechanical control center (“MCC”) and other miscellaneous equipment for the

WWTP. The chemical room would be used for chemical storage and pumping (metering) chemicals to plant areas.

Miscellaneous Improvements

The existing WWTP does not have potable water, rather all water currently used by the WWTP originates from an onsite groundwater well. The Proposed Project would connect to the existing potable water supply distribution system owned and operated by the City. Construction of the potable water connection would include new piping in the WWTP site and 3,700 linear feet of new potable water supply piping in the right-of-way of Walnut Avenue. Pipeline would extend west along Walnut Avenue to Thorp Avenue. The onsite groundwater well would then be abandoned. The potable water line would be sized to provide sufficient domestic water supply and fire flow to the WWTP. Upon completion of improvements in the right-of-way of Walnut Avenue and Thorp Avenue, and the access road between the WWTP and disposal fields, roads would be paved and/or re-paved. Additional improvements would include a new electrical system and installation of a 1250-kilowatt ("kW") standby generator,[5] arc flash consideration and safety protections, and a Supervisory Control and Data Acquisition ("SCADA") system.

Recycled Water Infrastructure

The Proposed Project would also include construction of recycled water infrastructure, including distribution pipelines, a recycled water pump station, and the use of the three existing aerated ponds as recycled water storage basins (see **Figure 5d**). More specifically, the existing aeration ponds #1, 2, and 3 would be converted into recycled water storage basins. The pump station would be constructed between effluent storage ponds #1 and #2 on an above grade concrete pad. This component also includes 5,150 linear feet of recycled water pipelines, which would be constructed in the existing right-of-way of Walnut Avenue and the existing access road connecting the WWTP with the existing effluent disposal site.

As discussed in the PDR, the City proposes to provide recycled water to agricultural fields adjacent to the WWTP in the future.

Recycled Water Use

Currently, the City disposes of treated effluent via a series of aerated ponds, percolation ponds, and disposal fields (i.e., spray fields). Due to concerns regarding percolation capacity and water quality impacts related to the use of the existing spray fields, the City has identified the adjacent agricultural parcels as suitable areas to provide recycled water for irrigation purposes (see **Figure 7**).

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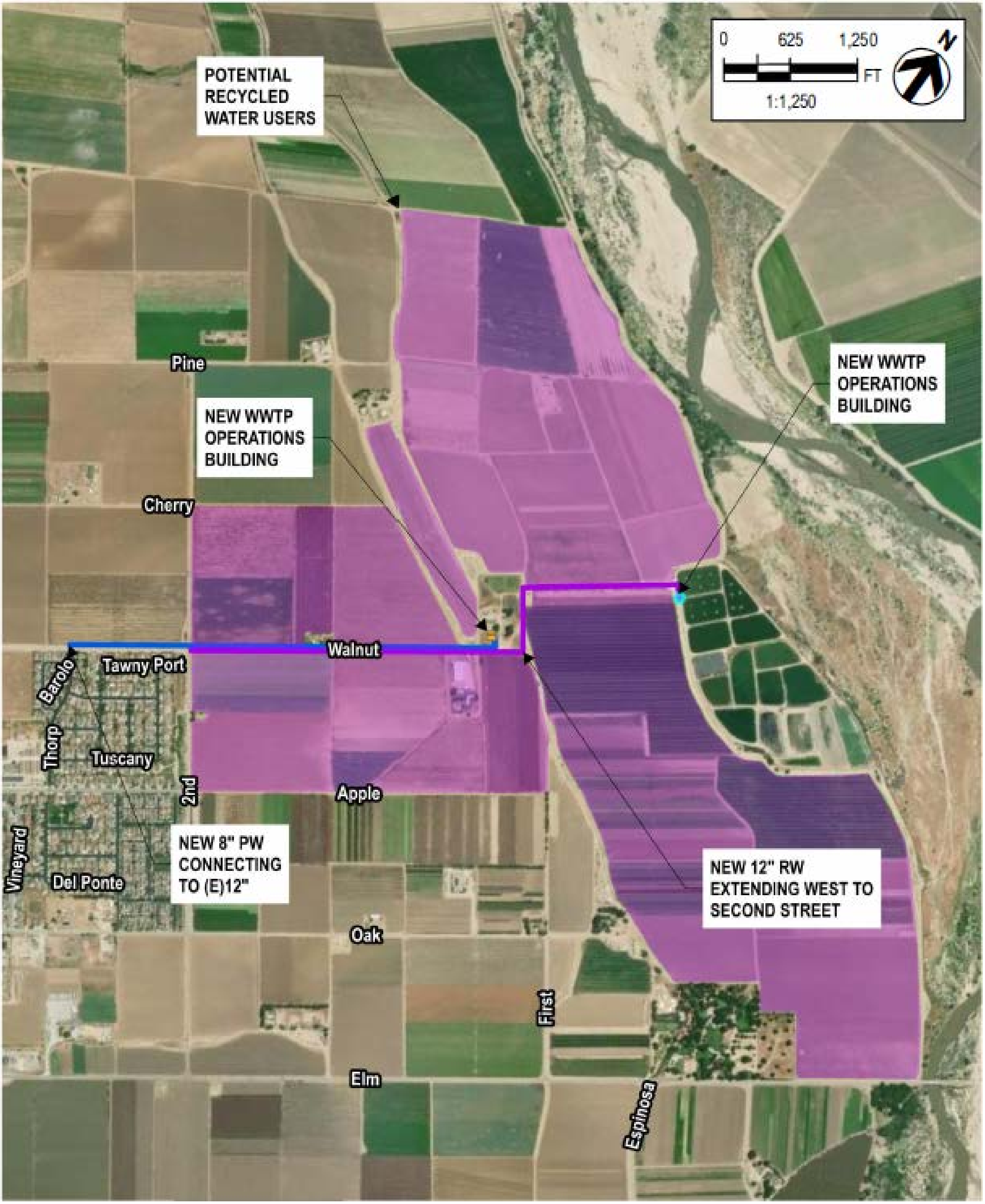
[5] The generator would be equipped with a below ground fuel tank capable of providing 24-hour operation at full power output. The generator would be located next to the electrical building and enclosed in a sound-attenuated and weather-protected housing unit.



Source: HydroScience. September 2023. Wastewater Upgrade Project Preliminary Design Report.

Recycled Water Distribution

Recycled Water Distribution	Date 04/02/2024 Scale N/A	DD&A **Denise Duffy & Associates, Inc.** Planning and Environmental Consulting	Figure 7

1.7 DRAINAGE

The Proposed Project also includes drainage improvements, including a stormwater basin, a new drain pump station, and storm drains. Drainage onsite would direct surface water around the WWTP to stormwater drains that eventually flow, or are pumped, to the headworks (see **Figure 8**). Where stormwater would not potentially be contaminated with wastewater, water would drain directly into the stormwater basins. The Proposed Project would include a plant drain pump station to collect stormwater flow from onsite buildings, onsite sewers, process drains, and all other stormwater drains. The plant drain pump station would be located in a 10-foot diameter pre-cast wet well. The wet well would have an overflow to direct excess water to the influent pump station wet well and equalization basin.

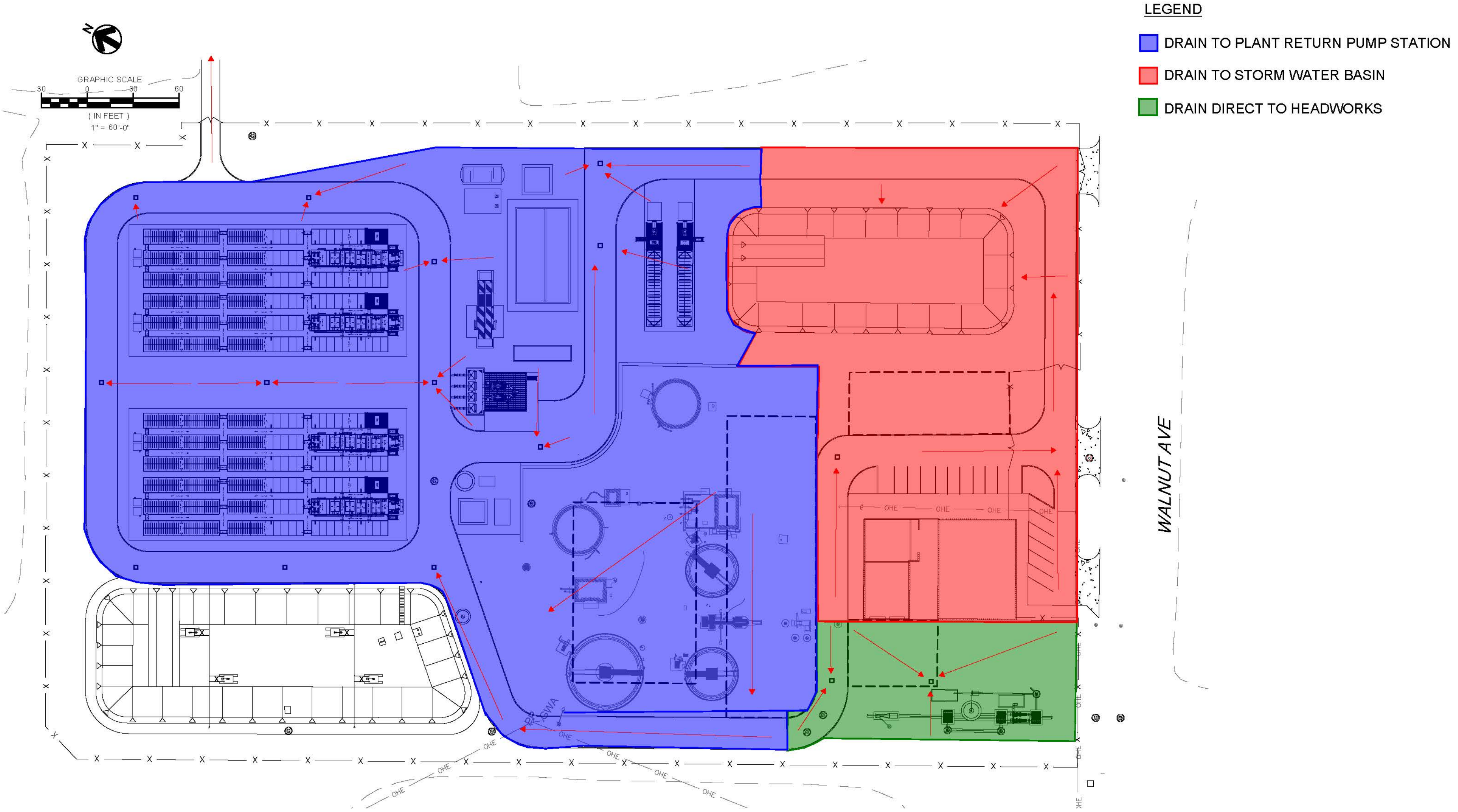
1.8 PROJECT CONSTRUCTION

The estimated number of construction workers on-site at any one time to complete the infrastructure improvements is approximately 10 – 50 workers. Construction would typically occur from 7:00 AM to 7:00 PM, Monday through Friday, and between 9:00 AM and 5:00 PM on Saturday and Sunday (City of Greenfield Municipal Code 9.28.030D). No construction would occur on Sundays or holidays. Nighttime construction may be necessary and would be reviewed and approved prior to initiation by the City of Greenfield Public Works Director. The start of construction depends on the project approval date, seasonal factors, market conditions, and the contractor’s schedule. However, construction is anticipated to begin Spring 2025 and end in Spring 2027. Construction would be phased, and this approach would enable the City to achieve the goal of constructing the Proposed Project while maintaining operation of the existing facilities. The PDR provides a preliminary construction schedule. This schedule is also listed, in order, below.

1. Stormwater Pond Relocation
2. Solids Drying Bed Abandonment
3. Site Preparation and Rough Grading
4. Construction of WWTP Improvements
5. Effluent Storage Pond Conversion and Recycled Water Pump Station
6. Power
7. Access

Site Preparation and Demolition

As previously discussed, the existing WWTP would be demolished after the new WWTP is constructed. Construction of the Proposed Project would involve tractors, backhoes, compactors, rollers, dump trucks, etc. Most of the equipment would be brought to the site at the beginning of work and remain until the completion of construction. As necessary, trucks would bring materials such as water pipes, gravel, and asphalt for the road, etc. to the site. These deliveries would take place over the course of construction of the Project. Preparation of the site would include clearing and grubbing surface features and removing or relocating utility poles, lights, fencing. Following construction of the new WWTP, the City would demolish the existing WWTP. Materials removed as a product of demolition would be collected onsite and hauled to a landfill.



Source: HydroScience. June 2023. Wastewater Upgrade Project Preliminary Design Report.

Proposed Drainage Improvements

Date
11/03/2023

Scale
N/A

DD&A

Denise Duffy & Associates, Inc.

PLANNING AND ENVIRONMENTAL CONSULTING

Figure
8

Grading

The Proposed Project would require importation of approximately 120,588 cubic yards of excavation and 82, 104 cubic yards of fill. The Proposed Project would also require approximately 11,446 cubic yards of soil stabilization material (i.e., Aggregate Base). All grading and excavation activities would be confined to an area of approximately 15-acres as illustrated in **Figure 9**. The Proposed Project is located in the 100-year floodplain. Therefore, construction of the WWTP would require modifications to the site's elevation through grading. The access roads and structures (e.g., recycled water pump station) would require grading. Excavated material would be stored in staging areas, or temporarily stored on City-owned property. Where appropriate, excavated materials would be used as backfill. All grading activities will generally be balanced and therefore should not result in a net export. The Proposed Project would require importation of engineered soil for soil stabilization.

1.9 SITE ACCESS

Regional access to the Project site is available from Highway 101. Local access to the Proposed Project site is available from Walnut Avenue. The Proposed Project would include improvements to site access through the reconstruction of Walnut Avenue, construction of new internal access roads, and public and employee parking.

1.10 OPERATION AND MAINTENANCE

Operation and maintenance of the Proposed Project would be consistent with existing facilities operation and maintenance activities. Operation of the Proposed Project would require six (6) to eight (8) full time operators/maintenance employees; an increase of three (3) to four (4) employees from existing operation staff. Material deliveries would occur on a weekly basis and could require two (2) – four (4) truck deliveries throughout the week, and increase from bi-monthly deliveries currently occurring onsite.

1.11 PROJECT-RELATED APPROVALS, PERMITS, AND CLEARANCES

The City is the lead agency with responsibility for approving the Proposed Project. This IS/MND may be relied upon for, but not limited to, approval by the following regulatory agencies:

- Federal Emergency Management Agency ("FEMA")
- California Department of Fish and Wildlife ("CDFW")
- California State Revolving Fund ("CA SRF")
- Regional Water Quality Control Board ("RWQCB")
- Monterey County Environmental Health
- Monterey County – Encroachment Permit
- Monterey Bay Air Resource District ("MBARD")

Area of Potential Effect

Date
10/25/2023

Scale
1:8,544

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Planning and Environmental Consulting

Figure
9

Path: P:\DDA Current Projects\2022-71 Greenfield Wastewater Treatment Plant Improvement Project\CEQA Plus\Administrative Draft ISMND\Figures

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Chapter 2. Environmental Factors Potentially Affected

The environmental factors checked below would be potentially affected by the Proposed Project involving at least one impact that is a "potentially significant impact," as discussed in the Initial Study analysis on the following pages.

☒ Aesthetics

☒ Biological Resources

☒ Geology/Soils

☒ Hydrology/Water Quality

☒ Noise

☐ Recreation

☒ Utilities/Service Systems

☒ Agricultural Resources

☒ Cultural Resources

☒ Greenhouse Gas Emissions

☒ Land Use/Planning

☒ Population/Housing

☒ Transportation

☐ Wildfire

☒ Air Quality

☒ Energy

☒ Hazards/Hazardous Materials

☐ Mineral Resources

☐ Public Services

☒ Tribal Cultural Resources

☐ Environmental Justice

☒ Mandatory Findings of Significance

Environmental Factors Not Affected

The following environmental resources were considered as part of the scoping and environmental analysis conducted for the Proposed Project. The potential for adverse impact to these resources were not identified. Consequently, there is no further discussion regarding these resources in this document.

<u>Mineral Resources:</u> The Surface Mining and Reclamation Act ("SMARA") of 1975 and the California Geological Survey ("CGS") defines and maps regional significant mineral resources. The Proposed Project site is located in a SMARA study area; however, no mineral resources are known to exist on the Proposed Project site (CGS, 2022). Additionally, the City of Greenfield General Plan, 2010 Monterey County General Plan, and Central Salinas Valley Area Plan do not designate the Proposed Project site as a mineral resource recovery site. For these reasons, the Proposed Project would have no impact on mineral resources. Therefore, no further discussion is necessary.

<u>Public Services:</u> The Proposed Project would not result in any potential adverse impacts resulting in the need for new or physically altered government facilities to maintain the acceptable service ratios, response times, or other performance objectives for any public services (e.g., fire protection, police protection, schools, parks, other public facilities). The Proposed Project would replace the existing WWTP and construct recycled water infrastructure. The Proposed Project would improve performance, accommodate future flows, and comply with current water quality standards. No direct impacts would occur. Indirectly, the Proposed Project could affect public services by accommodating growth in the City, however, the Proposed Project is necessary to accommodate planned growth under the City's General Plan and would not increase plant capacity beyond existing permitted levels (see **Section 4.12, Population and Housing**). The Proposed Project would improve the performance of the existing WWTP to ensure the facility can accommodate future flows and comply with current water quality standards. Recycled water generated by the Proposed Project would be used for agricultural purposes. For these reasons, the Project

would not result in a direct or indirect need for new or physically altered government facilities to maintain acceptable service ratios beyond what is currently provided or anticipated. The Greenfield Fire Department, the Greenfield Police Department, and Greenfield Unified School District currently serve the Project site. No impact would occur, and no further discussion is necessary.

Recreation: The Proposed Project would not cause a direct increase in the use of existing neighborhoods, regional parks, or other recreational facilities causing a substantial physical deterioration. The Proposed Project would not directly impact parks, trail easements, or other recreational opportunities, as the Proposed Project is not located near, or would not contain, recreational facilities. The Proposed Project could potentially result in indirect impacts to recreational facilities by accommodating future growth. However, the Proposed Project would not indirectly facilitate growth beyond existing levels identified in the City of Greenfield's General Plan and current Housing Element, please refer to the discussion above. Therefore, no impacts would occur, no further discussion is necessary.

Wildland Fire: The Proposed Project is not located in or near a state responsibility area or lands classified as a very high fire hazard severity zone. The Proposed Project would not substantially impair an adopted emergency response plan or emergency evacuation plan. The Proposed Project would not exacerbate wildfire risk due to slope or prevailing winds, and thus the Proposed Project would not expose occupants to pollutant concentrations from a wildfire or spread of a wildfire. The Proposed Project would not require the installation or maintenance of infrastructure that may exacerbate fire risk. For these reasons, the Proposed Project would have no impact on wildland fire.

Environmental Justice: California Government Code §65040.12 defines environmental justice as the "fair treatment of people of all races, cultures and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies." The Council on Environmental Quality ("CEQ") provides guidance for incorporating environmental justice into NEPA documentation. CEQ defines minority and low-income populations where the percentage of minority or low-income individuals is greater than 50 percent, or "meaningfully greater" than that of the general population. While the City of Greenfield does contain a population of minority or low-income individuals greater than 50 percent, the Proposed Project would not adversely affect minority or low-income populations (EPA, 2023). The Proposed Project is necessary to improve water quality, accommodate future flows, and reduce potential groundwater pumping by providing recycled water. The Proposed Project costs would not adversely affect any minority or low-income populations and/or adversely alter the socioeconomic conditions of populations that reside in the City. The Proposed Project would not include features that would result in a disproportionate adverse human health or environmental effect, have any physical effects on minority or low-income populations. For these reasons, the Proposed Project would have a net beneficial effect and would not result in any adverse impacts related to environmental justice considerations.

Chapter 3. Determination

On the basis of this initial evaluation:

☐ I find that the Proposed Project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the Proposed Project could have a significant effect on the environment there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the Proposed Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the Proposed Project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 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.

☐ I find that although the Proposed Project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the Proposed Project, nothing further is required.

Jamie Tugel ______________________ April 4, 2024 ______

Signature Date

Jamie Tugel, Public Works Director, City of Greenfield

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Chapter 4. Environmental Setting and Impacts

The following chapter assesses the environmental impacts associated with the Proposed Project and identifies mitigation measures to reduce potentially significant impacts to less than significant, as appropriate.

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 project-specific screening analysis).
2. All answers must consider the whole action involved, including offsite 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.
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 in 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 information sources for potential impacts (e.g., general plans, zoning ordinances) into the checklist references. 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.

4.1. Aesthetics

Environmental Setting

The Proposed Project site is in the northeast corner of the City of Greenfield, Monterey County, California. The Proposed Project is located in the Salinas Valley in Monterey, County. The Salinas Valley is identified as a prominent scenic feature in the Monterey County General Plan (Monterey County, 2010), and the City of Greenfield identifies agricultural and other open spaces, in addition to views of the Santa Lucia Mountains and Gabilan Mountain Ranges as scenic resources (City of Greenfield, 2005). The topography of the region varies from flat, farmed areas, to rolling hills with broad valleys, to steep slopes, rugged canyons, and prominent ridges of the Santa Lucia and Gabilan Ranges.

The existing visual character of the Proposed Project site is comprised of views of distant mountain ranges (Santa Lucia and Gabilan Mountains), the Salinas River, agricultural lands, and residential/commercial development in the City of Greenfield. The Proposed Project site consists of the existing WWTP, effluent treatment area, portions of Walnut Ave, an existing access road, and existing agricultural land as shown in **Figure 2**. The Proposed Project site consists primarily of existing disturbed and developed areas, as well as existing agricultural fields. Existing vegetation is primarily composed of ruderal vegetation in and around the Project site. Sparse vegetation is found along the perimeter of the Proposed Project site to the north, west, and south. The eastern boundary of the Project site abuts the Salinas River.

The *Central Salinas Valley Land Use Plan Scenic Highway Corridors & Visual Sensitivity* map does not identify the Proposed Project site as being located in a visually sensitive area (Monterey County, 2010). The Proposed Project site is not located in view of a designated scenic highway. There are no locally designated scenic roads in the project area. The City of Greenfield General Plan identifies agricultural and open space lands, and views of the Santa Lucia and Gabilan Mountains as scenic resources (City of Greenfield, 2005).

Regulatory Framework

State

California Scenic Highways Program: The Legislature created the California State Scenic Highway program in 1963. This program's purpose is to preserve and protect scenic highway corridors from change that would diminish the aesthetic value of lands adjacent to highways. The program includes a list of highways that are either designated or eligible for designation as a scenic highway. The state laws governing the Scenic Highway Program are found in the Streets and Highways Code, Sections 260 through 263. A highway may be designated scenic depending upon how much of the natural landscape can be seen by travelers, the scenic quality of the landscape, and the extent to which development intrudes upon the traveler's enjoyment of the view. In Monterey County, the state only officially designates portions of State Route ("SR") 1, and Laureles Grade Road is the only County designated road (Caltrans, 2023). There are no designated or eligible State or County highways in the vicinity of the Project site.

Local

Monterey County General Plan: The 2010 Monterey County General Plan includes policies related to the preservation of the visual integrity of the area.

Goal OS-1 – Retain the character and natural beauty of Monterey County by preserving, conserving, and maintaining unique physical features, natural resources, and agricultural operations.

Monterey County Code: The County of Monterey Zoning Ordinance (Title 21) requires an evaluation of potential aesthetic-related effects and a determination of significance from common public view areas. "Common public viewing area means a public area such as a public street, road, designated vista point, or public park from which the general public ordinarily views the surrounding viewshed" (Section 21.06.195). Monterey County defines a substantial adverse visual impact as a "visual impact which, considering the condition of the existing viewshed, the proximity and duration of view when observed with normal unaided vision, causes an existing visual experience to be materially degraded" (Section 21.06.1275).

Central Salinas County Area Plan: The Central Salinas County Area Plan ("CSCA"), as one of the area plans of Monterey County, further defines the Monterey County General Plan as it is more specific due to the limited geographic focus. Policies in the CSCA are consistent with the Monterey County General Plan but are adapted to the development opportunities, constraints, and natural resources unique to that region. No policies are relevant to the Proposed Project.

City of Greenfield General Plan**:** The City's General Plan include policies adopted for the purpose of avoiding or mitigating aesthetic impacts from development projects. The following policies are applicable to the project.

Policy 2.1.5 – Promote commercial, industrial, and residential development that supports the community character of Greenfield. New development shall consider scale, building design, and exterior materials, signage, landscaping, and proximity to services, shopping, parks, and schools.

Policy 2.8.5 – Encourage the use of attractive signage and monumentation at the entrances to residential districts, commercial areas, and other appropriate locations.

Policy 7.9.A – Review development applications for discretionary actions to determine aesthetic impacts and visual compatibility with surrounding property.

Would the project:		Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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 in a state scenic highway?	☐	☐	☐	■
c)	Substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	■	☐
d)	Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	■	☐	☐

Impact Discussion

a. *Have a substantial adverse effect on a scenic vista?*

The Proposed Project would not have a substantial adverse effect on a scenic vista. For this analysis, views of the Santa Lucia Mountains, Gabilan Mountains, and agricultural or open space areas would represent a scenic vista (City of Greenfield, 2005). Obstruction of views of any of these resources would constitute a potentially significant impact.

Construction

The Proposed Project could result in temporary construction related effects. However, the Proposed Project would be located primarily in the footprint of the existing WWTP, effluent treatment site, adjacent sod field, the right-of-way of Walnut Avenue and the existing access road and surrounding agricultural areas. These areas are currently disturbed and developed. Moreover, The Proposed Project consists of the construction of a new WWTP, the subsequent demolition of the existing WWTP, construction of recycled water infrastructure, and use of recycled water on adjacent agricultural parcels as shown in **Figure 7**. The Proposed Project would improve utilities (e.g., recycled water and potable water pipelines) onsite and in portions of Walnut Avenue and the access road between the WWTP and effluent disposal site. Construction associated with the Proposed Project would not result in additional aesthetic related impacts since the existing WWTP is developed with existing infrastructure. Additionally, construction of many of the improvements would be below ground (e.g., pipelines), and therefore would not be visible once operable. Lastly, the extension of recycled water service to adjacent agricultural parcels would not result in any potential impacts. Therefore, this impact is less than significant.

Operation

The Proposed Project would not result in a substantial adverse effect on a scenic vista due to operation. The Proposed Project, more specifically, the new WWTP and recycled water infrastructure would be located in the existing footprint of the WWTP. Additionally, other project improvements (i.e., pipelines) would be below ground in the existing road rights-of-way. The use of the Proposed Project site would not change from existing use and would be consistent with current zoning and land use. This impact would be less than significant.

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

The Proposed Project would not substantially damage scenic resources in a state scenic highway. The Proposed Project is not located near a state scenic highway or County designated scenic road. No impact would occur.

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 points). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?*

The Proposed Project would not adversely impact the existing visual character of the site or its surroundings or degrade the quality of public views of the site. The Proposed Project consists of the construction of a new WWTP, the subsequent demolition of the existing WWTP, construction of recycled water infrastructure, and use of recycled water on adjacent agricultural parcels as shown in **Figure 7**. Construction and operation of the Proposed Project would be primarily in the existing footprint of the WWTP and effluent treatment site, and portions of the right-of-way of Walnut Avenue, as well as the existing access road (see **Figure 9**). These areas are disturbed and/or currently developed. Additionally, recycled water would be used to irrigate adjacent agricultural fields as shown in **Figure 7**. The use of recycled water for irrigation purposes would not result in the construction of new infrastructure or uses that would generate an aesthetic impact. Recycled water infrastructure (i.e., pipelines) would be constructed to extend services to adjacent agricultural uses, but would not involve the construction of any above ground features that would substantially alter the existing aesthetic environment. Construction and operation of the Proposed Project would be consistent with existing development and would therefore not change the site's existing visual character. Above ground facilities and infrastructure would be designed and constructed consistent with the City's design specifications. Moreover, the Proposed Project site is located approximately two (2) miles east of the City of Greenfield city center, public views of the site are minimal due to distance. This impact is less than significant.

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

The Proposed Project would not create a new source of substantial light or glare which would adversely affect day or nighttime views of the area. The Proposed Project would potentially include exterior lighting for security and maintenance purposes. However, the lighting would be consistent with the City of Greenfield's lighting ordinances which requires that all exterior lighting be unobtrusive, harmonious with the local area, and constructed or located so that only the intended area is illuminated, and off-site glare is fully controlled (City of Greenfield Municipal Code 17.56.020). At the time that this IS/MND was prepared, *Lighting Plans* were not available for review, therefore, implementation of **Mitigation Measure AES-1** would ensure impacts related to lighting remain less than significant.

Mitigation Measure AES-1: Prior to the start of construction, a qualified lighting engineer shall prepare a comprehensive lighting plan for review and approval by the City of Greenfield Public Works Director. The lighting plan shall be prepared by a qualified lighting engineer and shall be in compliance with all applicable standards of the City's Municipal Code. The lighting plan shall address all aspects of lighting, including infrastructure, on-site driveways, safety signage and security lighting, as applicable. The lighting plan shall include, but not be limited to the following:

- Exterior on-site lighting shall be shielded, downlit, and confined in site boundaries.
- No direct rays or glare are permitted to shine onto public streets or adjacent sites.
- Parking area lighting shall include cut-off fixtures, and light standards shall not exceed 25-feet in height.
- On-site illumination shall be consistent with the standards and recommendations of the Illuminating Engineering Society of North America.
- Nighttime construction schedule and notice to residences 48 hours in advance.

4.2. Agricultural and Forestry Resources

Terminology

The California Department of Conservation ("DOC") identifies and designates important farmland throughout the State as part of the Farmland Mapping and Monitoring Program ("FMMP"). Farmland is classified as follows:

- **Prime Farmland.** Farmland with the best combination of physical and chemical features able to sustain long-term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. These are Class I and Class II soils.
- **Farmland of Statewide Importance.** Farmland similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.
- **Unique Farmland.** Farmland of lesser quality soils used to produce the state's leading agricultural crops. This land is usually irrigated but may include non-irrigated orchards or vineyards as found in some climactic zones in California.
- **Grazing Land.** Government Code §65570(b)(3) defines Grazing Land as: "...land on which the existing vegetation, whether grown naturally or through management, is suitable for grazing or browsing of livestock." The minimum mapping unit for Grazing Land is 40 acres. Grazing Land does not include land previously designated as Prime Farmland, Farmland of Statewide Importance, Unique Farmland, or Farmland of Local Importance, and heavily brushed, timbered, excessively steep, or rocky lands which restrict the access and movement of livestock.
- **Urban and Built-Up Land.** Land occupied by structures with a building density of at least one (1) unit to 1.5 acres, or approximately six (6) structures to a 10-acre parcel. This land is used for residential, industrial, commercial, construction, institutional, public administration, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes.
- **Other Land.** Land not included in any other mapping category. Common examples include low density rural developments; brush, timber, wetland, and riparian areas, not suitable for livestock grazing; confined livestock, poultry, or aquaculture facilities; strip mines, borrow pits; and water bodies smaller than 40 acres. Vacant and nonagricultural land surrounded by urban development and greater than 40 acres is mapped as Other Land.

California Public Resources Code §4526 and the California Board of Forestry and Fire Protection defines "Timberland" as land not owned by the federal government nor designated as experimental forest land, which is capable and available for growing any commercial tree species.

Environmental Setting

Agricultural activities consisting of farming and livestock grazing represent the largest industry in the County of Monterey and contribute significantly to the region's economy. The most productive farmlands in the County are located in the Salinas Valley. According to the 2017 Census of Agriculture for Monterey County, there are 1,340,142 acres designated as farmland (USDA, 2017). Monterey County's gross agricultural production in 2021 totaled 4.6 billion dollars (Monterey County Crop Report, 2021). The top crops in the County include vegetable crops, fruit, and nuts (Ibid.). The top revenue crops produced in

2021 included strawberries, leaf lettuce, head lettuce, broccoli, wine grapes, spinach, cauliflower, celery, and brussels sprouts (Ibid).

The Proposed Project is located in portions of the City of Greenfield and Monterey County. Historically agriculture has been the primary economic activity in and around the City of Greenfield (City of Greenfield, 2005). The primary crops in the surrounding area include strawberries, lettuce, and wine grapes. The FMMP designates the Proposed Project site as *Other Land, Urban and Built-up Land, Unique Farmland, Prime Farmland, and Farmland of Statewide Importance* (see **Figure 10**). The FMMP designates Land adjacent to the Proposed Project site primarily as *Prime Farmland* and *Farmland of Statewide Importance* (DOC, 2022). A portion of the Proposed Project site, specifically the existing sod field (APN 109-031-014-000), is enrolled in a Williamson Act contract. No other land under a Williamson Act contract is adjacent to the Project site.

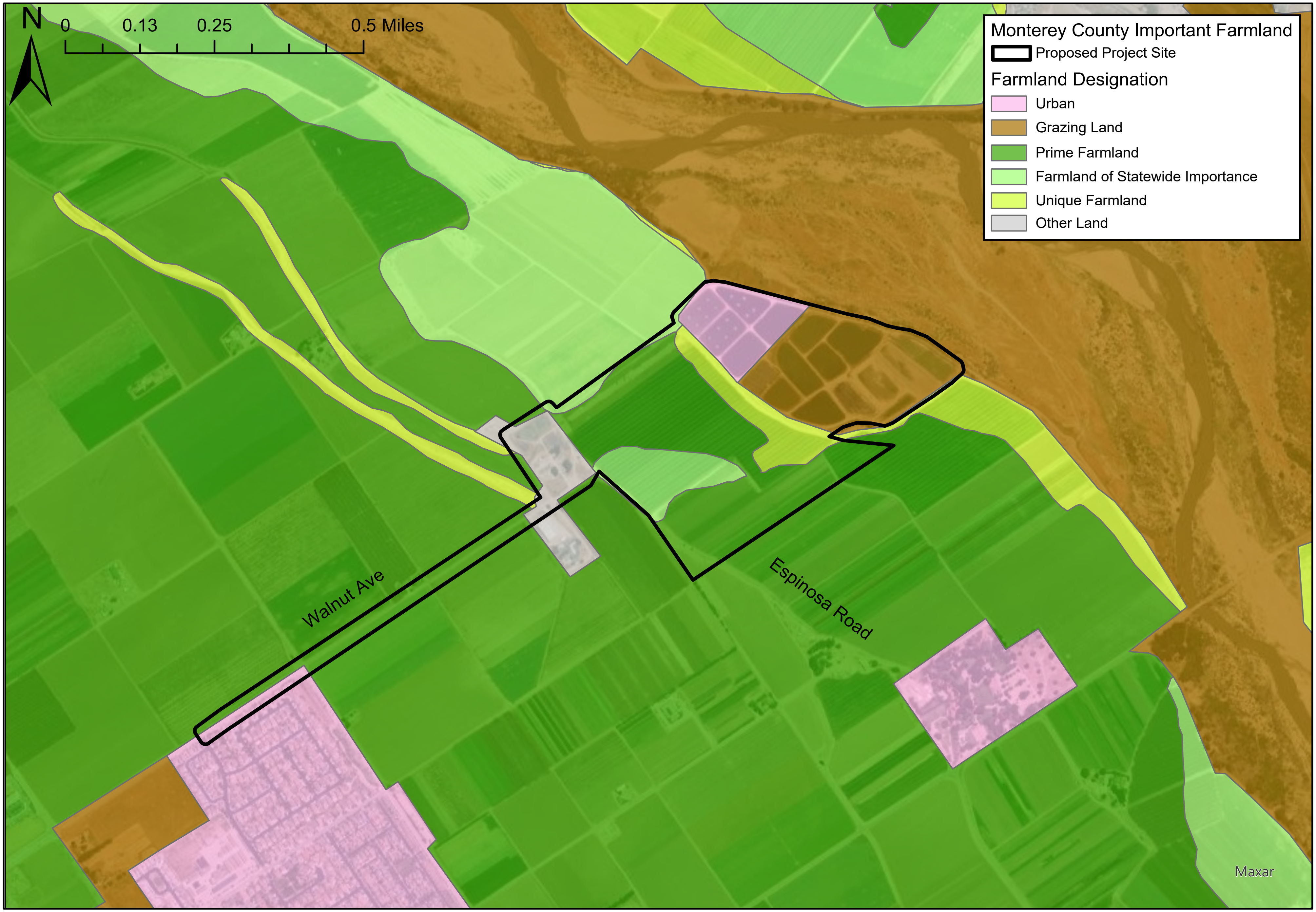
Regulatory Framework

Federal

Farmland Protection Policy Act**:** The Farmland Protection Policy Act ("FPPA") seeks to reduce federal program impacts on unnecessary and irreversible conversion of farmland to nonagricultural uses. This act requires federal agencies to develop and review policies to implement the FPPA every two years and comply with state and local programs and policies protecting farmland. The FPPA includes land such as forests, pasture, crop, or other land that may be used for farmland in the future. However, The FPPA does not include water or urban land. FPPA uses farmland classifications of "prime farmland," "unique farmland," and "land of statewide importance" (USDA 2024).

State

California Land Conservation Act of 1965 ("Williamson Act"): The California Land Conservation Act of 1965, commonly referred to as the Williamson Act, is the State's primary program aimed at conserving private land for agricultural use. The California Department of Conversation prepares countywide maps of lands enrolled in the Williamson Act contracts. The Williamson Act provides a voluntary, locally administered program offering reduced property taxes on lands whose owners place enforceable restrictions on land use through contracts between the individual landowners and local governments.



Farmland Mapping and Monitoring Map

Date
11/03/2023

Scale
N/A

Denise Duffy & Associates, Inc.
PLANNING AND ENVIRONMENTAL CONSULTING

Figure
10

Local

***Monterey County General Plan*:** None of the policies provided by the Monterey County General Plan are applicable to the Proposed Project.

***Central Salinas County Area Plan*:** None of the policies provided in the CSCA are applicable to the Proposed Project.

The City of Greenfield General Plan: The following policies are applicable to the Proposed Project.

Policy 2.1.7 – Require agricultural buffers on developments adjacent to agricultural land consistent with the Local Agency Formation Commission's ("LAFCO") requirements.

Policy 2.6.2 – Preserve agricultural lands and open space around the city to inhibit sprawl and maintain the rural community character of Greenfield.

Policy 7.1.2 – Minimize conflicts and negative impacts resulting from development that occurs in close proximity to agricultural uses.

Policy 7.1 C – New development shall provide adequate setbacks for non-agricultural structures adjacent to cultivated agriculture.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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 uses?	☐	☐	☐	■
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?	☐	☐	☐	■

Impact Discussion

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

The Proposed Project would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, to non-agricultural use. The Proposed Project would be primarily located at the existing WWTP site. The Proposed Project also includes potable and recycled water infrastructure located between Walnut Avenue and Thorp Avenue, with recycled water infrastructure located in the existing access road adjacent to the WWTP and in the existing effluent disposal site. Recycled water would supply adjacent agricultural fields as shown in **Figure 7**. Construction of the Proposed Project would be on soils not classified as FMMP soils. Operation of the Proposed Project, more specifically, the use of recycled water would also not convert FMMP soils to non-agricultural uses. Rather, the recycled water component of the Proposed Project would supply recycled water to adjacent agricultural parcels and reduce reliance on groundwater resources while providing a supplemental source of supply (see **Chapter 2. Project Description** for more detail). No proposals exist for physical changes to the sod field or adjacent agricultural uses. The sod field is designated as Prime Farmland and Farmland of Statewide Importance by the FMMP. The Proposed Project would not convert this land to non-agricultural use. No impact would occur.

b. *Conflict with existing zoning for agricultural use, or a Williamson Act contract*

The Proposed Project would not conflict with existing zoning for agricultural use, or a Williamson Act contract. A portion of the Proposed Project would occur on land currently zoned for agricultural use and under a Williamson Act Contract. However, construction and operation of the Proposed Project would not conflict with the existing zoning designation or allowable uses under the Williamson Act Contract because the Proposed Project would not change the operation of existing agricultural uses, including, but not limited to, the adjacent sod field. This impact is less than significant.

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

The Proposed Project would not conflict with existing zoning for, or cause rezoning of, forest land. No forest or timberland is located on or in the vicinity of the Proposed Project site. No impact would occur.

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

Please refer to the discussion above. The Proposed Project would not result in the loss of forest land or conversion of forest land to non-forest use. No impact would occur.

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?*

The Proposed Project would not involve changes to the exiting environment which due to the location or nature could result in conversion of farmland to non-agricultural use or forest land to non-forest use. Moreover, construction and operation of the Proposed Project would have a net benefit to agricultural uses surrounding the site as the Proposed Project would provide recycled water and reduce reliance on groundwater resources. No impact would occur.

4.3. Air Quality

Environmental Setting

The Proposed Project is in the North Central Coast Air Basin ("NCCAB"), which encompasses Santa Cruz, San Benito, and Monterey counties. The NCCAB is under the jurisdiction of the Monterey Bay Air Resources District ("MBARD"). MBARD is responsible for producing an Air Quality Management Plan ("AQMP") that reports air quality and regulates stationary air pollution sources throughout the NCCAB. MBARD is also responsible for measuring the concentration of pollutants and comparing those concentrations against the Ambient Air Quality Standards ("AAQS"). AAQS establish levels of air quality maintenance required to protect the public from the adverse effects of air pollution and are established for "criteria air pollutants" which include ozone, carbon monoxide, particulate matter less than 10 microns in diameter, 2.5 microns in diameter, nitrogen dioxide, sulfur dioxide, and lead. MBARD is responsible for monitoring criteria pollutants to determine whether they are in attainment or not in attainment with the AQMP. **Table 4.3-1** illustrates the attainment status for criteria pollutants.

Table 4.3-1 Attainment Status for the NCCAB

Pollutants	State Designation	Federal Designation
Ozone (O_3)	Nonattainment – Transitional	Attainment
Inhalable Particulates (PM_{10})	Nonattainment	Attainment
Fine Particulates ($PM_{2.5}$)	Attainment	Attainment
Carbon Monoxide (CO)	Monterey Co. – Attainment	Attainment
	San Benito Co. – Unclassified	Attainment
	Santa Cruz Co. – Unclassified	Attainment
Nitrogen Dioxide (NO_2)	Attainment	Attainment
Sulfur Dioxide (SO_2)	Attainment	Attainment
Lead	Attainment	Attainment

Source: Monterey Bay Air Resources District, 2017. 2012 – 2015 Air Quality Management Plan

MBARD has set air quality thresholds of significance for the evaluation of projects. **Table 4.3-2** illustrates the thresholds of significance used to determine if a project would have a significant air quality effect during construction. In addition to these thresholds, MBARD has also determined a significant short-term construction generated impact would occur if more than 2.2 acres of major grading or excavation, or 8.1 acres of minimal earthmoving per day was to occur.

Table 4.3-2 Thresholds of Significance Construction Emissions

Pollutant	Threshold of Significance (lb./day)
Nitrogen Oxides (NO_x)	173
Reactive Organic Gases (ROG)	137
Respirable Particular Matter (PM_{10})	82
Fine Particulate Matter ($PM_{2.5}$)	55
Carbon Monoxide (CO)	550

Source: Monterey Bay Unified Air Pollution Control District, 2016. Guidelines for Implementing the California Environmental Quality Act.

Table 4.3-3 illustrates the thresholds of significance used to determine if a project would have a significant air quality effect on the environment during operation.

Table 4.3-3 Thresholds of Significance Operational Emissions

Pollutant	Threshold of Significance (lb./day)
Nitrogen Oxides (NO_x)	137
Reactive Organic Gases (ROG)	137
Respirable Particular Matter (PM_{10})	82
Fine Particulate Matter ($PM_{2.5}$)	55
Carbon Monoxide (CO)	550

Source: Monterey Bay Unified Air Pollution Control District, 2016. Guidelines for Implementing the California Environmental Quality Act.

The California Air Resources Board ("CARB") defines a sensitive receptor as children, elderly, asthmatic, and others who are at elevated risk of negative health outcomes due to exposure to air pollution (CARB, 2023). Pursuant to California Health and Safety Code Sec. 42705.5, a sensitive receptor includes hospitals, schools and day cares centers and such locations as the district or state board may determine. MBARD similarly defines sensitive receptors and requires any explanation of sensitive receptors to draw a relationship to the Proposed Project site and potential air quality impacts (MBARD, 2008).

Climate and Topography

Climatological conditions, an area's topography, and the quantity and type of pollutants released commonly determine ambient air quality. The NCCAB covers an area of 5,159 square miles along the central coast. The northwest sector of the NCCAB is dominated by the Santa Cruz Mountains. The Diablo Range marks the northeastern boundary. The Santa Clara Valley extends into the northeastern tip of the basin. Further south, the Santa Clara Valley becomes the San Benito Valley, which runs northwest-southeast, with the Gabilan Range as its western boundary. To the west of the Gabilan Range is the Salinas Valley, which extends from Salinas at the northwest end to south of King City. The coastal Santa Lucia Range defines the western side of the valley.

Climate, or the average weather condition, affects air quality in several ways. Wind patterns can remove or add air pollutants emitted by either stationary or mobile sources. Inversion, a condition where warm air traps cooler air underneath it, can hold pollutants near the ground by limiting upward mixing (dilution). Communities with cold climates may burn wood or other fuels for residential heating, whereas areas with hot climates may have higher emissions or some pollutants from automobiles. Topography also plays a part, and valleys often trap emissions by limiting lateral dispersal.

A semi-permanent high-pressure cell in the eastern Pacific, the Pacific High, is the basic controlling factor in the climate of the NCCAB. In the summer, the high-pressure cell is dominant and causes persistent west and northwest winds over the entire coast. Air descends in the Pacific High, forming a stable temperature inversion of hot air over a cool coastal layer of air. The onshore air currents pass over cool ocean waters to bring fog and relatively cool air into the coastal valleys. The warmer air aloft acts as a lid to inhibit vertical air movement. During the winter, the Pacific High migrates southward and has less influence on the NCCAB. Air frequently flows in a southeasterly direction out of the Salinas and San Benito Valleys, especially during night and morning hours. The general absence of deep, persistent inversions and the occasional storm systems usually result in good air quality for the basin in winter and early spring.

Regulatory Framework

Federal

***U.S. Environmental Protection Agency ("EPA")*:** At the federal level, the U.S. EPA implements national air quality programs. The Federal Clean Air Act ("FCAA"), signed in 1970, provides air quality mandates used by the U.S. EPA. Congress amended the FCAA in 1977 and again in 1990.

***Federal Clean Air Act*:** The FCAA required the U.S. EPA to establish National Ambient Air Quality Standards ("NAAQS") and set deadlines for their attainment. Two (2) types of NAAQS exist: primary standards, which protect public health, and secondary standards, which protect public welfare from non-health-related adverse effects, such as visibility restrictions. The FCAA allows states to adopt additional or more health-protective standards. **Table 4.3-4** summarizes the California Ambient Air Quality Standards and the NAAQS.

Table 4.3-4
Summary of Ambient Air Quality Standards

Pollutant	Averaging Time	California Standard*	National Standards (Primary)
Ozone	1-Hour	0.09 ppm	- -
	8-Hour	0.07 ppm	0.070 ppm
PM_{10}	AAM	20 µg/m^3	- -
	24-Hour	50 µg/m^3	150 µg/m^3
$PM_{2.5}$	AAM	12 µg/m^3	12 µg/m^3
	24-Hour	No standard	35 µg/m^3
Carbon Monoxide	1-Hour	20 ppm	35 ppm
	8-Hour	9.0 ppm	9 ppm
Nitrogen Dioxide	AAM	0.030 ppm	0.053 ppm
	1-Hour	0.18 ppm	100 ppm
Sulfur Dioxide	AAM	- -	0.03 ppm
	24-Hour	0.04 ppm	0.14 ppm
	3-Hour	- -	0.5 ppm (1300 µg/m^3) **
	1-Hour	0.25 ppm	75 ppm
Lead	30- day	1.5 µg/m^3	- -
	Calendar quarter	- -	1.5 µg/m^3
	Rolling 3-month	- -	0.15 µg/m^3
Sulfate	24-Hour	25 µg/m3	No Federal Standards
Hydrogen Sulfide	1-Hour	0.03 ppm (42 µg/m^3)	
Vinyl Chloride	24-Hour	0.01 ppm (26 µg/m^3)	
Visibility Reducing Particles	8-hours	Extinction coefficient of 0.23 per kilometer —visibility of ten miles or more (0.07 — 30 miles or more for Lake Tahoe) due to particles when relative humidity is < 70%.	

Source: https://ww2.arb.ca.gov/sites/default/files/2020-07/aaqs2.pdf (September 30, 2021)
ppm = Parts per Million; µg/m^3 = Micrograms per Cubic Meter; AAM = Annual Arithmetic Mean
* For more information on standards visit :http//www.arb.ca.gov.research/aaqs/aaqs2.pdf
**Secondary Standard
Source: CARB 2018c

The FCAA also required each state to prepare an air quality control plan referred to as a State Implementation Plan ("SIP"). The 1990 FCAA Amendments required states with non-attainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is periodically modified to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. The U.S. EPA has the responsibility to review all state SIPs to determine conformance with the mandates of the FCAA and FCAA amendments. The U.S. EPA also determines if implementation will achieve air quality goals. If the U.S. EPA determines a SIP to be inadequate, a Federal Implementation Plan ("FIP") may be prepared for the non-attainment area that imposes additional control measures.

Pursuant to California Clean Air Act ("CCAA") and CCAA amendments, a region must participate in the SIP if the state designates it as a maintenance region. The most recent Federal Plan prepared by MBARD to maintain the 1-hour ozone NAAQS is the 2007 Federal Maintenance Plan for Maintaining the National Ozone Standard in the Monterey Bay Region and adopted rules and regulations.[6]

State

California Air Resources Board**:** CARB is the agency responsible for coordinating and overseeing state and local air pollution control programs in California and implementing the CCAA of 1988. Other CARB duties include monitoring air quality (in conjunction with air monitoring networks maintained by air pollution control districts and air quality management districts, establishing California Ambient Air Quality Standards ("CAAQS"), which in many cases are more stringent than the NAAQS, and setting emissions standards for new motor vehicles.[7] **Table 5.3-5** summarizes the CAAQS above.

California Clean Air Act**:** The CCAA requires all air districts in the state to endeavor to achieve and maintain CAAQS for Ozone, CO, SO_2, and NO_2 by the earliest practical date. The CCAA specifies that districts focus particular attention on reducing emissions from transportation and area-wide emission sources, and the act provides districts with authority to regulate indirect sources of emissions. Each district plan is required to either (1) achieve a five (5) percent annual reduction, averaged over consecutive 3-year periods, in district-wide emissions of each nonattainment pollutant or its precursors, or (2) provide for the implementation of all feasible measures to reduce emissions. Any planning effort for air quality attainment would thus need to consider both state and federal planning requirements.

Assembly Bills 1807 & 2588 - Toxic Air Contaminants**:** California Assembly Bill ("AB") 1807 (Tanner Air Toxics Act) and AB 2588 (Air Toxics Hot Spots Information and Assessment Act of 1987) primarily regulate Toxic Air Contaminants ("TACs"). The Tanner Air Toxics Act sets forth a formal procedure for CARB to designate substances as TACs. This procedure includes research, public participation, and scientific peer review before CARB designates a substance as a TAC. Existing sources of TACs that are subject to the Air Toxics Hot Spots Information and Assessment Act are required to: (1) prepare a toxic emissions inventory; (2) prepare a risk assessment if emissions are significant; (3) notify the public of significant risk levels; and (4) prepare and implement risk reduction measures.

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[7] The emission standards established for motor vehicles differ depending on various factors including the model year, and the type of vehicle, fuel, and engine used.

Local

***Monterey Bay Air Resources District*:** MBARD is the agency primarily responsible for ensuring that NAAQS and CAAQS are not exceeded and that air quality conditions are maintained in the NCCAB. Responsibilities of the MBARD include, but are not limited to, preparing plans for the attainment of ambient air quality standards, adopting, and enforcing rules and regulations concerning sources of air pollution, issuing permits for stationary sources of air pollution, inspecting stationary sources of air pollution, responding to citizen complaints, monitoring ambient air quality and meteorological conditions, and implementing programs and regulations required by the FCAA and the CCAA. To achieve NAAQS and CAAQS and maintain air quality, the MBARD has most recently completed the 2012-2015 AQMP for achieving the state ozone standards and the 2007 Federal Maintenance Plan for maintaining federal ozone standards (MBARD 2017).

To achieve and maintain ambient air quality standards, the MBARD has adopted various rules and regulations for the control of airborne pollutants. The applicable MBARD rules and regulations to the Proposed Project include, but are not limited to, the following:

- **Rule 402 (Nuisances).** The purpose of this rule is to prohibit emissions that may create a public nuisance. Applies to any source operation that emits or may emit air contaminants or other materials.
- **Rule 426 (Architectural Coatings).** The purpose of this rule is to limit emissions of volatile organic compounds from architectural coatings.
- **Rule 425 (Use of Cutback Asphalt).** The purpose of this rule is to limit emissions of vapors of organic compounds from the use of cutback and emulsified asphalt. This rule applies to the manufacture and use of cutback, slow cure, and emulsified asphalt during paving and maintenance operations.
- **Rule 424 (NESHAP-Asbestos).** Rule 424 adopts the National Emissions Standards for Hazardous Air Pollutants contained in the Code of Federal Regulations (40 CFR Part 61) pertaining to asbestos removal and building demolitions.

***Monterey County General Plan*:** None of the policies provided by the Monterey County General Plan are applicable to the Proposed Project.

***Central Salinas County Area Plan*:** None of the policies provided in the CSCA are applicable to the Proposed Project.

***City of Greenfield General* Plan:** The City of Greenfield has adopted General Plan policies for the purpose of avoiding or mitigating air quality impacts from development projects. The following policies are applicable to the Project:

Policy 8.5.1 – Support the reduction of air pollutants through land use, transportation, and energy use planning.

Policy 8.5.2 – Encourage transportation modes that minimize contaminant emissions from motor vehicle use.

Policy 8.5.3 – Implement the General Plan to be consistent with the pollution reduction goals of the Air Quality Management Plan for the Monterey Bay Region, as periodically updated.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	☐	■	☐

Impact Discussion

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

CEQA Guidelines Section 15125(b) requires that a project be evaluated for consistency with applicable regional plans, including the AQMP. The most recent AQMP update was approved in March 2017. This plan addresses attainment of the State ozone standards and federal air quality standard. The AQMP accommodates growth by projecting growth in emissions based on population forecasts prepared by the Association of Monterey Bay Area Governments ("AMBAG"). Consistency determinations are issued for commercial, industrial, residential, and infrastructure-related projects that have the potential to induce population growth. A project is inconsistent with the AQMP if it has not been accommodated in the forecast projections considered in the AQMP.

The Proposed Project was identified in the City of Greenfield's General Plan as necessary to accommodate growth under the General Plan. Moreover, the Proposed Project would not exceed the permitted treatment capacity (i.e., 2.0 mgd) as detailed in the existing WDR. Because the Proposed Project is necessary to address existing water quality issues associated with the existing WWTP and would not induce additional population growth beyond the levels contemplated in the City's General Plan, the Proposed Project would not conflict with and/or otherwise obstruct implementation of the AQMP. For these reasons, this impact is less than significant.

b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?

The MBARD 2016 CEQA Air Quality Guidelines contain standards of significance for evaluating potential air quality effects of projects subject to the requirements of CEQA. According to MBARD, a project would violate an air quality standard and/or contribute to an existing or projected violation if it would emit (from all sources, including exhaust and fugitive dust) less than:

- 137 pounds per day of oxides of nitrogen (NO_x),
- 137 pounds per day of reactive organic gases (ROG),
- 82 pounds per day of respirable particulate matter (PM_{10}),
- 55 pounds per day of fine particulate matter ($PM_{2.5}$), and
- 550 pounds per day carbon monoxide (CO).

Potential air quality effects were quantified using CalEEMod. Air quality calculations are provided in **Appendix A**, **CalEEMod Results**.

Construction

Construction of the Proposed Project would require substantial grading and excavation (approximately 120,588 cubic yards of excavation, 82,104 cubic yards of backfill, and 11,446 cubic yards of aggregate base for soil stabilization). Ground disturbing activities would occur in approximately 15 acres as illustrated in **Figure 9**. Construction would require equipment such as tractors, backhoes, excavators, loading trucks, and pickup trucks. Construction related emissions would come from sources such as exhaust or fugitive dust. Air quality effects were quantified using CalEEMod, **Table 4.3-5**, illustrates the emissions generated by construction.

Table 4.3-5 Construction Air Quality Emissions

	Emissions in Pounds/Day				
	NO_x	**$PM_{2.5}$**	**PM_{10}**	**ROG**	**CO**
Significance Thresholds (MBARD)	137	55	82	137	550
Emissions Generated by the Proposed Project	31.7	5.2	34	10	30.9
Exceed Threshold?	No	No	No	No	No

Source: Emissions Source: Appendix A, CalEEMod Air Quality and GHG Calculations Spreadsheets
Significance Threshold Source: MBARD, 2016

Based on the CalEEMod analysis, construction of the Proposed Project would not exceed MBARD daily emission thresholds. Furthermore, construction of the Proposed Project would implement standard Best Management Practices ("BMPs") to ensure emissions are minimized. BMPs include but are not limited to:

- Reduce the amount of the disturbed area where possible;
- Use of water trucks or sprinkler systems in sufficient quantities to prevent airborne dust from leaving the site. Increased watering frequency would be required whenever wind speeds exceed 15 mph. Reclaimed (non-potable) water shall be used whenever possible;
- All dirt stockpile areas shall be sprayed daily as needed;
- Permanent dust control measures identified in the approved project re-vegetation and landscape plans shall be implemented as soon as possible following completion of any soil disturbing activities;
- Exposed ground areas that are planned to be reworked at dates greater than one month after initial grading shall be sown with a fast germinating, non-invasive grass seed and watered until vegetation is established;
- All disturbed soil areas not subject to re-vegetation shall be stabilized using chemical soil binders, jute netting, or other methods approved in advance by the MBARD;
- All trucks hauling dirt, sand, soil, or other loose materials are to be covered or shall maintain at least two feet of freeboard (minimum vertical distance between top of load and top of trailer) in accordance with CVC Section 23114;

- Install track-out control devices where vehicles enter and exit unpaved roads onto streets, or wash off trucks and equipment leaving the site;
- Use of water trucks or sprinkler systems in sufficient quantities to prevent airborne dust from leaving the site. Increased watering frequency would be required whenever wind speeds exceed 15 mph. Reclaimed (non-potable) water shall be used whenever possible;
- All dirt stock pile areas shall be sprayed daily as needed;
- Permanent dust control measures identified in the approved project re-vegetation and landscape plans shall be implemented as soon as possible following completion of any soil disturbing activities;
- Exposed ground areas that are planned to be reworked at dates greater than one month after initial grading shall be sown with a fast germinating, non-invasive grass seed and watered until vegetation is established;
- All disturbed soil areas not subject to re-vegetation shall be stabilized using chemical soil binders, jute netting, or other methods approved in advance by the MBARD;
- All trucks hauling dirt, sand, soil, or other loose materials are to be covered or shall maintain at least two feet of freeboard (minimum vertical distance between top of load and top of trailer) in accordance with CVC Section 23114;
- Install track-out control devices where vehicles enter and exit unpaved roads onto streets, or wash off trucks and equipment leaving the site;
- Sweep paved/unpaved roadways boundaries (e.g.) project entrance roadways) at the end of each day if visible soil material is carried onto adjacent paved roads. Water sweepers with reclaimed water shall be used where feasible;
- Maintain all construction equipment in proper tune according to manufacturer’s specifications;
- Fuel all off-road and portable diesel-powered equipment with CARB certified motor vehicle diesel fuel (non-taxed version suitable for use off-road);
- Use diesel construction equipment over 25 horsepower meeting CARB's Tier 2 certified engines or cleaner off-road heavy-duty diesel engines and comply with the State Off-Road Regulation. If Tier 2 equipment is not available, then documentation shall be maintained demonstrating equipment non-availability for verification;
- Use on-road heavy-duty trucks on-site that meet the CARB’s 2007 or cleaner certification standard for on-road heavy-duty diesel engines, and comply with the State On-Road Regulation;
- Construction or trucking companies with fleets that do not have engines in their fleet that meet the engine standards identified in the above two measures (e.g. captive or NO_X exempt area fleets) may be eligible by proving alternative compliance;
- All on- and off-road diesel equipment shall not idle for more than five minutes. Signs shall be posted in the designated staging areas and at the project entrance to remind drivers and operators of the five-minute idling limit;
- Diesel idling in 1,000 feet of sensitive receptors is not permitted (applicable only along the northernmost edge of the project site);
- Electrify equipment when feasible;
- Substitute gasoline-powered in place of diesel-powered equipment, where feasible; and
- Use alternatively fueled construction equipment on-site where feasible, such as compressed natural gas (“CNG”), liquefied natural gas (“LNG”), propane or biodiesel.
- Implement Idling Restrictions Near Sensitive Receptors for Both On and off-Road Equipment

In addition to BMPs, the Proposed Project would be required to prepare a Storm Water Pollution Prevention Plan ("SWPPP") which includes requirements for dust suppression. Furthermore, the Proposed Project would be required to comply with MBARDs Rule 439. Rule 439 includes *Demolition and Deconstruction Notes* on the construction plans that address mechanisms for reducing air pollution during demolition. As discussed in **Chapter 2. Project Description**, construction of the Proposed Project would occur in phases over two (2) years. Therefore, the Proposed Project would result in intermittent ground-disturbing activities and would not likely exceed MBARD's daily ground disturbing thresholds for excavation (2.2 acres per day) or grading (8.1 acres per day). To ensure MBARD's daily thresholds of significance are not exceeded, the Proposed Project would implement **Mitigation Measure AQ-1**, below.

Operation

The Project would result in operational emissions due to operational energy use and traffic. Operation of the Proposed Project would require substantially more energy than the existing WWTP. More specifically, the Proposed Project would increase energy use by approximately 2,000 - percent as compared to existing WWTP energy use. The increase in operational energy demand could result in potential operational air quality emissions. For more detail regarding energy, please see **Section 4.6, Energy**.

While the Proposed Project would increase operational energy demand, the Proposed Project would not significantly increase traffic trips beyond those associated with existing facility operations (see **Section 4.13, Transportation** for a more detail discussion). The Proposed Project would result in an increase in operational employees. The City of Greenfield anticipates that six (6) to eight (8) employees are necessary for operations. This would represent a minimal increase in existing employees. Therefore, there would not be a significant increase in operational emissions associated with traffic-related impacts.

Based on the CalEEMod analysis, operation of the Proposed Project would not exceed daily MBARD thresholds, see **Table 4.3-6** below.

Table 4.3-6 Operational Air Quality Emissions

	Emissions in Pounds/Day				
	NO_x	$PM_{2.5}$	PM_{10}	ROG	CO
Significance Thresholds (MBARD)	137	55	82	137	550
Emissions Generated by the Proposed Project	0.3	2.1	20.6	1.0	2.93
Exceed Threshold?	No	No	No	No	No

Source: Emissions Source: Appendix A, CalEEMod Air Quality and GHG Calculations Spreadsheets
Significance Threshold Source: MBARD, 2016

The results of the air quality modeling indicate that the Proposed Project would not exceed any of the applicable MBARD thresholds of significance identified above. As a result, the Proposed Project would result in a less than significant impact to air quality during operation.

> **Mitigation Measure AQ-1:** Prior to start of construction, the contractor shall prepare a Construction Phasing Plan that limits daily ground disturbing activities to no more than 2.2 acres per day of major earth moving or 8.1 acres per day of minimal earth moving. The Construction Phasing Plan shall be included as part of the final grading plans prepared for the Proposed Project and shall also identify applicable BMPs to be implemented during construction to ensure that fugitive dust emissions are minimized. The Construction Phasing Plan shall be submitted to the City of Greenfield Director of Public Works for review and approval prior to the start of construction.

c. Expose sensitive receptors to substantial pollutant concentrations?

Construction

The Proposed Project could expose sensitive receptors to substantial pollutant concentrations. The nearest sensitive receptors are residences located at the western edge of the Proposed Project site, at the intersection of Walnut and Thorp Street. Construction activities could occur in 25-feet of these residences. Construction near these residences would be required for installation of pipelines in the road right-of-way and would be temporary in nature. More extensive construction activities would occur at the existing WWTP site. The nearest sensitive receptor is 700 feet south of the WWTP site. Other groups that may be impacted by construction in the rest of the Proposed Project site include agricultural workers.

Air quality emissions generated from construction activities would be temporary in nature and would be minimized through the implementation of standard BMPs, and **Mitigation Measures AQ-1**. In addition to construction generated emissions, the City of Greenfield General Plan identified the Proposed Project area to be subject to naturally occurring asbestos. Asbestos is a fibrous silicate mineral that occurs in soil and when disturbed can become airborne. Exposure to asbestos can cause health problems such as lung cancer or lung disease. Implementation of BMPs, as listed above, would minimize exposure through dust suppression requirements.

Operation

Please refer to impact discussion 4.3(a), the Proposed Project could result in increased emissions during operation, however any increase in emissions would be below MBARD thresholds. No sensitive receptor would be exposed to a substantial pollutant concentration. This impact is less than significant.

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

The Proposed Project could generate intermittent odors from construction associated with diesel exhaust that could be noticeable at times. However, given the temporary nature of construction and the phased approach to construction, these potential intermittent odors are not anticipated to result in impacts nor affect a substantial number of people. Any odors generated during construction activities would cease upon completion. The Proposed Project would also generate operational odors associated with wastewater treatment that could be noticeable at times; however, such odors would be consistent with, if not less than, existing odors associated with the operation of the existing WWTP. This impact is less than significant.

4.4. Biological Resources

Terminology

Special-Status Species

Special-status species are those plants and animals that have been formally listed or proposed for listing as endangered or threatened or are candidates for such listing under the Federal Endangered Species Act ("ESA") or the California Endangered Species Act ("CESA"). Listed species are afforded legal protection under the ESA and CESA. Species that meet the definition of rare or endangered under the CEQA Section 15380 are also considered special-status species. Animals on the CDFW's list of "species of special concern" (most of which are species whose breeding populations in California may face extirpation if current population trends continue) meet this definition and are typically provided management consideration through the CEQA process, although they are not legally protected under the ESA or CESA. Additionally, the CDFW also includes some animal species that are not assigned any of the other status designations on their "Special Animals" list; however, these species have no legal or protection status.

Plants listed as rare under the California Native Plant Protection Act ("CNPPA") or included in the California Native Plant Society ("CNPS") California Rare Plant Ranks ("CRPR") 1A, 1B, 2A, and 2B are also treated as special-status species as they meet the definitions of Sections 2062 and 2067 of the CESA and in accordance with CEQA Guidelines Section 15380. In general, the CDFW requires that plant species on CRPR 1A (Plants presumed extirpated in California and Either Rare or Extinct Elsewhere), CRPR 1B (Plants rare, threatened, or endangered in California and elsewhere), CRPR 2A (Plants presumed extirpated in California, but more common elsewhere); and CRPR 2B (Plants rare, threatened, or endangered in California, but more common elsewhere) of the CNPS *Inventory of Rare and Endangered Vascular Plants of California* (CNPS, 2023) be fully considered during the preparation of environmental documents relating to CEQA. CNPS' CRPR 4 species (plants of limited distribution) may, but generally do not, meet the definitions of Sections 2062 and 2067 of the CESA, and are not typically considered in environmental documents relating to CEQA. While other species (i.e., CRPR 3 or 4 species) are sometimes found in database searches or in the literature, these were not included in the analysis as they did not meet the definitions of Section 2062 and 2067 of the CESA.

Fish and Game Code Section 3503.5 protects raptors (e.g., eagles, hawks, and owls) and their nests in California. Section 3503.5 states that it is "unlawful to take, possess, or destroy the nest or eggs of any such bird except otherwise provided by this code or any regulation adopted pursuant thereto." Additionally, fully protected species under the Fish and Game Code Section 3511 (birds), Section 4700 (mammals), Section 5515 (fish), and Section 5050 (reptiles and amphibians) are also considered special-status animal species. Species with no formal special-status designation but thought by experts to be rare or in serious decline may also be considered special-status animal species in some cases, depending on project-specific analysis and relevant, localized conservation needs or precedence.

Sensitive Habitats

Sensitive habitats include riparian corridors, wetlands, habitats for legally protected species, areas of high biological diversity, areas supporting rare or special-status wildlife habitat, and unusual or regionally restricted vegetation types. Vegetation types considered sensitive include those listed on CDFW's *California Natural Communities List* (i.e., those habitats that are rare or endangered in the borders of California) (CDFW, 2023), those that are occupied by species listed under the ESA or are critical habitat in accordance with the ESA, and those that are defined as Environmentally Sensitive Habitat Areas under the California Coastal Act. Specific habitats may also be identified as sensitive in city or county general plans or ordinances. Sensitive habitats are regulated under federal regulations (such as the Clean Water Act and Executive Order 11990 – Protection of Wetlands), state regulations (such as CEQA and the CDFW Streambed Alteration Program), or local ordinances or policies (such as city or county tree ordinances and general plan policies).

Environmental Setting

The Proposed Project site is located in the Salinas Valley which is bounded by the Santa Lucia Mountains to the west, and the Gabilan Mountains to the east. The Proposed Project site is previously disturbed in connection with the existing WWTP and associated infrastructure, existing roads, and agricultural uses.

Survey Methodology

DD&A conducted a site reconnaissance and biological survey of the Proposed Project site on May 17, 2023. Survey methods included walking the Proposed Project site and immediately adjacent areas (an area approximately 142.7 acres) and using aerial maps and GPS to identify general habitat types and potential sensitive habitat types. DD&A used survey data to assess the environmental conditions of the Proposed Project site and the area immediately adjacent to the site and evaluate environmental constraints at the site and in the local vicinity. A biological resources report was developed and provides a basis for recommendations to minimize and avoid impacts, see **Appendix B**.

DD&A surveyed the Proposed Project site for botanical resources following the applicable guidelines outlined in *Guidelines for Conducting and Reporting Botanical Inventories for Federally listed, Proposed and Candidate Plants* (U.S. Fish and Wildlife Service [“Service”], 2000), *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFW, 2018), and CNPS *Botanical Survey Guidelines* (CNPS, 2001). The primary literature and data sources reviewed to determine the occurrence or potential for occurrence of special-status species in the Proposed Project site are as follows:

- Current agency status information from the Service and CDFW for species listed, proposed for listing, or candidates for listing as threatened or endangered under the ESA or CESA, and those considered CDFW “species of special concern”, including:
    - California Natural Diversity Database (“CNDDB”) occurrences reports from the Greenfield quadrangle and the eight surrounding quadrangles, including Soledad, North Chalone Peak, Topo Valley, Paraiso Springs, Pinalito Canyon, Reliz Canyon, Thompson Canyon, and San Lucas (CDFW, 2023; Appendix A); and
    - Service IPaC Resource List (Service, 2023a; Appendix B).
- The CNPS *Inventory of Rare and Endangered Vascular Plants of California* (CNPS, 2023);
- The U.S. Department of Agriculture (“USDA”) Natural Resources Conservation Service (“NRCS”) Web Soil Survey (USDA-NRCS, 2023); and
- The National Wetlands Inventory Wetlands Mapper (Service, 2023b).

From these resources, DD&A generated a list of special-status plant and wildlife species known or with the potential to occur in or adjacent to the Proposed Project site.

Habitat Classification

Active Agriculture: Approximately 72.7 acres (50 – percent of the survey area) of active agriculture occurs in the survey area (**Figure 11**). Active agriculture operations include row crops and sod. Agricultural areas have low biological value due to the constant disturbance regime associated with agricultural activities.

Ruderal/Disturbed: Approximately 62.2 acres (43 – percent of the survey area) of ruderal habitat consisting of dirt roads, the effluent disposal site, and surrounding facilities, and the existing WWTP, was present in the survey area (**Figure 11**). Ruderal/disturbed areas are those areas which have been developed or have been subject to historic and ongoing disturbance by human activities and are devoid of vegetation or dominated by non-native and/or invasive weed species. Dominant plant species along the edges of the Walnut Avenue, the access road, and wastewater treatment facilities include sow thistle (*Silybum marianum*), wild mustard (*Brassica* sp.), cheeseweed (*Malva parviflora*), long-beaked filaree (*Erodium botrys*), red-stemmed filaree (*Erodium cicutarium*), horseweed (*Erigeron canadensis*), poison hemlock (*Conium maculatum*), sweet clover (*Melilotus* sp.*)*, and annual non-native grasses. Blue gum eucalyptus (*Eucalyptus globulus)* and Peruvian pepper trees (*Schinus molle*) were present along the margins of the agricultural roads.

Ruderal areas are considered to have low biological value as they are generally dominated by non-native plant species and consist of relatively low-quality habitat from a wildlife perspective. However, common wildlife species which do well in urbanized and disturbed areas, such as the American crow (*Corvus brachyrhynchos*), California ground squirrel (*Otospermophilus beecheyi*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), western scrub jay (*Aphelocoma californica*), European starling (*Sturnus vulgaris*), western fence lizard (*Sceloporus occidentalis*), and rock pigeon (*Columba livia*), may forage in ruderal habitat in the survey area.

Scrub: Approximately 2.2 acres (.01 percent of the survey area) of scrub habitat is present in the survey area (**Figure 11**).The structure of plant associations that comprise scrub habitat typically consist of low to moderate-sized shrubs with sclerophyllous leaves, flexible branches, semi-woody stems growing from a woody base, and a shallow root system. Scrub vegetation is present along the northern boundary of the survey area as the survey area nears the Salinas River floodplain. The dominant plant species in the scrub habitat include coyote brush (*Baccharis pilularis*), wild mustard (*Brassica* sp.), and English ivy (*Hedera helix*) as well as non-native annual grasses including slender wild oat (*Avena barbata*) and rip-gut brome (*Bromus diandrus*). Non dominant plant species include arroyo willow trees (*Salix lasiolepis*), narrow leaf willow (*Salix exigua*), blue elder (*Sambucus cerulea*), and California poppies (*Eschscholzia californica*).
Though vegetative productivity is low in scrub habitat, scrub habitat appears to support several of wildlife species (Stebbins, 1978). Common wildlife observed in scrub habitat include scrub jay, chestnut-backed chickadee (*Poecile rufescens*), western fence lizard, and brush rabbit (*Sylvilagus bachmani*). Scrub habitat in the survey area may provide habitat for San Joaquin whipsnake, and nesting habitat for white-tailed kite.

Sensitive Habitats: No sensitive habitats were identified in the survey area.

Special-Status Species

No special-status plant species were observed or have the potential to occur in the project parcel. Two special-status wildlife species have a moderate potential to occur in or immediately adjacent to the Project site. These species are detailed below. In addition, raptors and other protected avian species have the potential to nest in trees present in the Project site. All other species are unlikely to occur or have a low potential to occur and are therefore unlikely to be impacted by the project and are not discussed further.

Habitat Map

Date
11/29/2023

Scale
1 in = 703 ft

DENISE DUFFY & ASSOCIATES, INC.
Planning and Environmental Consulting

Figure
11

Path: P:\DDA Current Projects\2022-71 Greenfield Wastewater Treatment Plant Improvement Project\Technical Reports\Biological Resources\Figures

San Joaquin Whipsnake: The San Joaquin whipsnake is a CDFW species of special concern. Whipsnakes seek cover in rodent burrows, bushes, trees, and rock piles. This species hibernates in soil or sand approximately 0.3 meter (1 foot) below the surface, sometimes at the bases of plants. Little is known about nest sites. Open terrestrial habitats are preferred, but whipsnakes will occasionally climb trees and bushes to bask, seek prey, or take cover. Mating occurs in April and May, eggs are laid in June and July, and the first young appear in late August to early September.

The CNDDB reports three (3) occurrences of San Joaquin whipsnake in the quadrangles evaluated. The nearest occurrence is 4.3 miles from the survey area. Habitat quality for San Joaquin whipsnake in the survey area is low. Most of the site is ruderal, agriculture, or developed habitat that does not provide appropriate cover or habitat conditions for San Joaquin whipsnake. However, the 2.2 acres of open scrub habitat in the survey area may provide suitable habitat for San Joaquin whipsnake. As discussed below, this habitat type is in the survey area but outside of the Proposed Project impact area (see **Figure 11**).

White-Tailed Kite: The white-tailed kite is a California fully protected species and is protected by the Migratory Bird Treaty Act ("MBTA"). This raptor species is a common to uncommon, year-long resident in coastal and valley lowlands. White-tailed kite utilizes herbaceous lowlands with variable tree growth and an associated high population density of voles (*Microtus californicus*). Nests are made of loosely piled sticks and twigs and lined with grass, straw, or rootlets. Nests are generally placed near the top of dense oak (*Quercus* sp.), willow, or other tree stands (usually 6-20 meters [20-100 feet] above ground) and are often located near an open foraging area. Breeding occurs from February to October with peak activity occurring from May to August. This species preys predominantly on voles and other small mammals, but also takes birds, insects, reptiles, and amphibians. Foraging occurs in undisturbed open grasslands, meadows, farmlands, and emergent wetlands.

The survey area is in the known breeding range of the white-tailed kite. The CNDDB reports 4 occurrences of the white-tailed kite in the quadrangles reviewed. The nearest CNDDB occurrence is located approximately 1.9 miles from the survey area. This species was not observed during the May 2023 reconnaissance-level survey, but the survey area provides suitable habitat for foraging and nesting. Therefore, white-tailed kite has moderate potential to occur in the survey area.

Protected Avian Species

The California Fish and Game Code protects raptors and other nesting birds. While the life histories of these species vary, overlapping nesting and foraging similarities allow for their concurrent discussion. Most raptors are breeding residents throughout most of the wooded portions of the state. Stands of live oak, riparian deciduous, or other forest habitats, as well as open grasslands, are used most frequently for nesting. Smaller avian species may also nest in scrub habitats and urban areas. Breeding occurs February through September, with peak activity May through July. Various avian species, such as California scrub jay (*Aphelocoma californica*), dark-eyed junco (*Junco hyemalis*), mourning dove (*Zenaida macroura*), and sparrows (*Zonotrichia* sp.), have a potential to nest in the trees present in the survey area.

Regulatory Environment

Federal

Federal Endangered Species Act: Provisions of the ESA of 1973 (16 USC 1532 et seq., as amended) protect federally listed threatened or endangered species and their habitats from unlawful take. Listed species include those for which proposed and final rules are published in the Federal Register. The ESA is administered by the Service or National Oceanic and Atmospheric Administration ("NOAA") National Marine Fisheries Service ("NMFS"). In general, NMFS is responsible for the protection of ESA-listed marine species and anadromous fish, whereas other listed species are under Service jurisdiction.

Section 9 of ESA prohibits the take of any fish or wildlife species listed under ESA as endangered or threatened. Take, as defined by ESA, is “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct.” The ESA defines harm as “any act that kills or injures the fish or wildlife…including significant habitat modification or degradation that significantly impairs essential behavioral patterns of fish or wildlife.” Additionally, Section 9 prohibits removing, digging up, and maliciously damaging or destroying federally listed plants on sites under federal jurisdiction. Section 9 does not prohibit the take of federally listed plants on sites not under federal jurisdiction. If there is the potential for incidental take of a federally listed fish or wildlife species, take of listed species can be authorized through either the Section 7 consultation process for federal actions or a Section 10 incidental take permit process for non-federal actions. Federal agency actions include activities on federal land, conducted by a federal agency, funded by a federal agency, or authorized by a federal agency (including issuance of federal permits).

***Clean Water Act*.** The U.S. Army Corps of Engineers (“USACE”) and U.S. EPA regulate discharge of dredged and fill material into waters of the U.S. under Section 404 of the Clean Water Act (“CWA”). Waters of the U.S. are defined broadly as waters susceptible to use in commerce (including waters subject to tides, interstate waters, and interstate wetlands) and other waters (such as interstate lakes, rivers, streams, mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds) (33 CFR 328.3). Potential wetland areas are identified 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 soils conditions.”

Under Section 401 of the CWA, any applicant receiving a Section 404 permit from the USACE must also obtain a Section 401 Water Quality Certification from the RWQCB. A Section 401 Water Quality Certification is issued when a project is demonstrated to comply with state water quality standards and other aquatic resource protection requirements.

State

***California Endangered Species Act*:** The CESA was enacted in 1984. The California Code of Regulations (Title 14, §670.5) lists animal species considered endangered or threatened by the state. Sec. 2090 of CESA requires state agencies to comply with endangered species protection and recovery and to promote conservation of these species. Sec. 2080 of the Fish and Game Code prohibits "take" of any species the commission determines to be an endangered species or a threatened species. Sec. 86 of the Fish and Game Code defines “take” as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." Section 2081 Incidental Take Permit from the CDFW may be obtained to authorize “take” of any state listed species.

***California Native Plant Protection Act*:** The CNPPA of 1977 directed CDFW to conduct the legislature’s intent to “preserve, protect and enhance rare and Endangered plants in the State." The CNPPA prohibits importing rare and Endangered plants into California, taking rare and Endangered plants, and selling rare and Endangered plants. The CESA and CNPPA authorized the Fish and Game Commission to designate endangered, threatened, and rare species and to regulate the taking of these species (Sec. 2050-2098, Fish and Game Code). Plants listed as *rare* under the CNPPA are not protected under CESA; however, these plants may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research.

***California Fish and Game Code*:** Sec. 3503 of the Fish and Game Code states that it is “unlawful to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto.” Sec. 3503.5 prohibits the killing, possession, or destruction of any birds in the orders Falconiformes or Strigiformes (birds-of-prey). Sec. 3511 prohibits the take or possession of fully protected birds. Sec. 3513 prohibits the take or possession of any migratory nongame birds designated under the federal Migratory Bird Treaty Act. Sec. 3800 prohibits the take of nongame birds.

The classification of Fully Protected was the state's initial effort in the 1960's to identify and provide additional protection to those animals that were rare or faced extinction. Lists were created for fish (Sec. 5515), mammals (Sec.4700), amphibians and reptiles (Sec.5050), and birds (Sec.3511). Most Fully Protected species have also been listed as threatened or endangered species under the more recent endangered species laws and regulations. Fully Protected species may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock.

The CDFW also maintains a list of wildlife “species of special concern.” Although these species have no legal status, the CDFW recommends considering these species during analysis of project impacts to protect declining populations and avoid the need to list them as endangered in the future.

Local

***Monterey County General Plan*:** Relevant policies are listed below.

Policy OS-4.1: Federal and State listed native marine and freshwater species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant shall be protected. Species designated in Area Plans shall also be protected.

Policy OS-4.2*:* Direct and indirect discharges of harmful substances into marine waters, rivers or streams shall not exceed state or federal standards.

Policy OS-4.3*:* Estuaries, salt and freshwater marshes, tide pools, wetlands, sloughs, river and stream mouth areas, plus all waterways that drain and have impact on State designated Areas of Special Biological Significance (“ASBS”) shall be protected, maintained, and preserved in accordance with state and federal water quality regulations.

Policy OS-5.3*:* Development shall be carefully planned to provide for the conservation and maintenance of critical habitat.

Policy OS-5.4*:* Development shall avoid, minimize, and mitigate impacts to listed species and critical habitat to the extent feasible. Measures may include but are not limited to:

a. clustering lots for development to avoid critical habitat areas,

b. dedications of permanent conservation easements; or
c. other appropriate means.

If development may affect listed species, consultation with United States Fish and Wildlife Service ("USFWS") and California Department of Fish and Game ("CDFG") may be required and impacts may be mitigated by expanding the resource elsewhere on-site or in close proximity off-site. Final mitigation requirements would be determined as required by law.

Monterey County Code. Section 16.16.050 (K) of the Monterey County Code identifies that the following standards of construction are required for areas in 200 feet of a river or in 50 feet of a watercourse:

- A setback of two hundred (200) feet from the top of the bank of a river and fifty (50) feet from the top of the bank of a watercourse will be established where encroachment will be prohibited unless it can be proven to the satisfaction of the Monterey County Water Resources Agency that:
  1. The proposed development will not significantly reduce the capacity of existing rivers or watercourses or otherwise adversely affect any other properties by increasing stream velocities or depths, or diverting the flow; and
  2. The proposed new development will be safe from flow related erosion and will not cause flow related erosion hazards or otherwise aggravate flow related erosion hazards.

***Central Salinas County Area Plan*:** None of the policies provided in the CSCA are applicable to the Proposed Project.

***City of Greenfield General Plan*:** Policies in the City's General Plan have been adopted for the purpose of avoiding or mitigating biological resource impacts from development projects. The following policies are applicable to the Project.

Policy 7.5.2*:* Encourage preservation of portions of important wildlife habitats that would be disturbed by major development.

Policy 7.5.4: Development in sensitive habitat areas should be avoided or mitigated to the maximum extent possible.

- *Program 7.5.A* Prior to development, areas with potential wildlife habitat shall be surveyed for special status plant and/or animal species. If any special status plant or animal species are found in areas proposed for development, the appropriate resource agencies shall be contacted and species-specific management strategies established to ensure the protection of the particular species.
- *Program 7.5.B* Participate with regional, state, and federal agencies and organizations to establish and preserve open space that provides habitat for local wildlife.
- *Program 7.5.C* At the discretion of the City, development proposals will be required to submit detailed biological resource assessments as part of the application or CEQA review process. Projects shall demonstrate compliance with the recommendations of those assessments.
- *Program 7.5.D* The City shall explore the feasibility of a citywide habitat mitigation fee as an alternative to site-specific mitigation requirements.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	■	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☐	☐	■
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	■
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?	☐	☐	☐	■

Impact Discussion

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

The Proposed Project could 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 CDFW or USFWS. DD&A identified that the Proposed Project site includes suitable habitat for two (2) special-status wildlife species, San Joaquin Whipsnake and White-Tailed Kite. As a result, the Proposed Project could, directly or indirectly, affect special-status species. Moreover, construction activities associated with the recycled water infrastructure (see **Chapter 2, Project Description**) could result in direct mortality of this species if they were to disperse from the adjacent scrub habitat. This impact would be potentially significant. However, this impact can be reduced to a less-than-significant level with implementation of **Mitigation Measure BIO-1** and **Mitigation Measure BIO-2**.

Raptors and other protected avian species, including the white-tailed kite, have the potential to occur in the Proposed Project site (particularly in the agricultural fields [foraging habitat], and near the effluent spray fields [nesting habitat]). Construction activities, including vegetation removal and excavation, during the breeding and nesting seasons could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment in the survey area. This impact would be potentially significant but could be reduced to a less-than-significant level with implementation of **Mitigation Measure BIO-1** and **Mitigation Measure BIO-3**.

For these reasons, the Proposed Project could have a significant impact on species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service, such affects would be minimized through mitigation measures identified below.

Operation

The Proposed Project would not have a substantial adverse effect on any species identified as a candidate, sensitive, or special status species because of operation. Operation of the Proposed Project would not likely result in an impact as use of the site would not change from existing use.

> **Mitigation Measure BIO-1:** Prior to construction activities, the City of Greenfield or their designated representative shall retain a qualified biologist to conduct an Employee Education Program for the construction crew. The biologist shall meet with the construction crew at the Proposed Project site at the onset of construction to educate the construction crew on the following: a) a review of the project boundaries; b) all special-status species that may be present, their habitat, and proper identification; c) the specific mitigation measures that will be incorporated into the construction effort; d) the general provisions and protections afforded by the regulatory agencies; and e) the proper procedures if a special-status animal is encountered in the Proposed Project site.
>
> **Mitigation Measure BIO-2:** Prior to ground disturbing activities in the effluent disposal site adjacent to scrub habitat, a qualified biologist shall conduct a clearance survey in suitable habitat for San Joaquin whipsnake. If San Joaquin whipsnake is observed during construction, measures will be taken to avoid the individual(s) and the species will be allowed to leave on its own volition or will be relocated outside of the survey area by the qualified biologist.
>
> **Mitigation Measure BIO-3:** Construction activities that may directly (e.g., vegetation removal) or indirectly affect (e.g., noise/ground disturbance) nesting raptors and other protected avian species shall be timed to avoid the breeding and nesting seasons (February 1 through September 15).
>
> If construction activities must occur during the breeding and nesting season (February 1 through September 15), a qualified biologist shall conduct pre-construction surveys for nesting raptors and other protected avian species in 300 feet of the proposed construction activities. Pre-construction surveys should be conducted no more than 7 days prior to the start of the construction activities during the early part of the breeding season (February through April) and no more than 14 days prior to the initiation of these activities during the late part of the breeding season (May through August).

If raptors or other protected avian nests are identified during the pre-construction surveys, the qualified biologist would notify the contractor and an appropriate no-disturbance buffer would be imposed in which no construction activities or disturbance would take place (generally 300 feet in all directions for raptors; other avian species may have species-specific requirements) until the young of the year have fledged and are no longer reliant upon the nest or parental care for survival, as determined by a qualified biologist.

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

The Proposed Project would not have a substantial adverse effect on any riparian habitat or other sensitive natural community as the Proposed Project site does not contain any riparian habitat or sensitive natural communities. The Proposed Project site is located adjacent to the Salinas River. However, construction of the Proposed Project would be confined to previously disturbed areas of the existing WWTP, effluent disposal site, and road rights-of-way (see **Figure 9**). Construction activities are not anticipated to impact riparian habitat. Therefore, the Proposed Project would not result in a substantial adverse effect to any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the CDFW or USFWS. No Impact would occur.

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

The Proposed Project would not have a substantial adverse effect on any federally protected wetland as the Proposed Project site does not contain any wetlands, and therefore, the Project would not adversely affect federally protected wetlands as defined by Section 404 of the Clean Water Act. No Impact would occur.

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?*

The Proposed Project would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites. The Proposed Project site is adjacent to the historic Salinas River flood bank (Earth Systems, 2023). The Proposed Project would result in improvements in existing disturbed areas. Improvements or use of the Proposed Project site would be consistent with existing WWTP infrastructure and use (i.e., the Proposed Project would not change the existing use of the site or surrounding areas). Additionally, the Proposed Project site would not require the development of additional roads or structures for access that would disconnect, fragment, or otherwise impede wildlife movement in the area. Infrastructure would be located in exiting disturbed areas or areas currently used for agricultural purposes. Therefore, this impact is less than significant, and no mitigation is required.

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

The Proposed Project would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance because the project will not require tree removal.

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

The Proposed Project would not conflict with an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan because the survey area is not located in any such plan area. No impact would occur.

4.5 Cultural Resources

Albion Environmental , Inc. ("Albion") prepared a Phase I Cultural Resource Inventory for the Proposed Project in March 2024. The Phase 1 Cultural Resource Inventory includes the results of background research and field reconnaissance of the Proposed Project's Area of Potential Effect ("APE") (See **Figure 9**). Background research consisted of a records search from the Northwest Information Center at Sonoma State University ("NWIC"), a Sacred Lands File search with the Native American Heritage Commission ("NAHC"), and Native American consultation in support of consultation under NHPA Section 106 and AB 52. The field reconnaissance consisted of a pedestrian survey of the APE on November 15, 2023, which investigated three (3) survey areas within the APE for cultural and Tribal cultural resources.

Environmental Setting

In 1840, the Mexican government conveyed Rancho Arroyo Seco, which includes the area of Greenfield, to Joaquín de la Torre. By 1858, a new settlement known as Three Mile Flat had formed in what is now Greenfield. A map from 1883 indicated the Proposed Project site was undeveloped, consisting mostly of willow trees along the Salinas River (Albion, 2024).

The City of Greenfield has numerous historic resources, most dating from the period of the City's growth and development from 1901 to 1955. The most notable concentration of historic resources is located in the downtown area and are composed of commercial, institutional, and residential buildings. While the City of Greenfield contains historic resources, the 2005 General Plan states that many need official recognition (City of Greenfield, 2005).

The proximity of the Proposed Project site to the Salinas River suggests the area is generally sensitive to "precolonial habitation sites" (Albion, 2024). However, records do not indicate the presence of precolonial habitation sites in the vicinity of the Proposed Project site. The Cultural Resource Inventory identified only one (1) previous archeological study within Proposed Project site and two (2) studies occurring within a 1/2-mile radius. Each study identified no cultural resources as having been discovered within a 1/2-mile radius of the Project site (Albion, 2024). Archival research identified aerial photographs from 1956 which show only 30 percent of the Project site under cultivation, and by 1971, 60 percent of this area was under cultivation. Archival research determined that development of structures on the site did not occur before 1956 (Albion, 2024). Therefore, historic-era resources are unlikely to be found. A 2023 pedestrian survey also did not identify any archaeological resources (Albion, 2024). Albion's investigation identified 17 previous archaeological surveys and one (1) previously recorded site. While the entire area has not been surveyed, the Sacred Lands search did not identify any Native American resources in the area.

Native American Consultation

The City of Greenfield, and Albion on behalf of the City, sent letters containing a brief project description and maps of the APE to the following groups identified by the NAHC in December 2023: the Amah Mutsun Tribal Band, Costanoan Rumsen Carmel Tribe, Amah Mutsun Tribal Band of Mission San Juan Bautista, Ohlone/Costanoan-Esselen Nation, Salinan Tribe of Monterey and San Luis Obispo Counties, Esselen Tribe of Monterey County, Indian Canyon Mutsun Band of Costanoan, Rumsen Am:a Tur:ataj Ohlone, Wuksache Indian Tribe/Eshom Valley Band, and Xolon-Salinan Tribe. Request for consultation were received from the Esselen Tribe of Monterey County, Salinan Tribe of Monterey, Ohlone/Costoanoan-Esselen Nation, and Indian Canyon Band of Costanoan Ohlone People for consultation in January 2024.

Both the Esselen Tribe of Monterey County and the Indian Canyon Band of Costanoan Ohlone People requested that preconstruction training and tribal monitoring for both on-site and off-site ground disturbance be included in the Proposed Project. And, requested that cultural sensitivity training be provided at the start of construction. The Xolon-Salinan Tribe requested additional information about the Project which included a copy of the final archaeological report and project coordinates.

Albion sent follow up emails to all contacted Tribes on January 18, 2024, and again on March 8, 2024 to coordinate in-person (or virtual) consultation meetings as requested. No responses were received. At the request of the City, consultation pursuant to Section 106 and AB 52 concluded on March 13, 2024.

Regulatory Environment

Federal

National Historic Preservation Act. Section 106 of the National Historic Preservation Act of 1966 (54 U.S.C. § 300301 et seq.), as amended, requires that a federal agency with direct or indirect jurisdiction over a proposed federal or federally assisted undertaking, or issuing licenses or permits, consider the effect of the proposed undertaking on historic properties. A historic property may include a prehistoric or historic-era building, structure, object, site or district included in, or eligible for inclusion in, the National Register maintained by the U.S. Secretary of the Interior. Federal agencies must also allow the ACHP to comment on the proposed undertaking and its potential effects on historic properties. The implementing regulations for Section 106 of the NHPA (36 CFR 800) require consultation with the SHPO, the ACHP, federally recognized Indian tribes and other Native Americans, and interested members of the public throughout the compliance process. The four (4) principal steps are:

- Initiate the Section 106 process, including consultation with interested parties (36 CFR 800.3);
- Identify historic properties, i.e., resources included in or eligible for inclusion in the National Register (36 CFR 800.4);
- Assess the effects of the undertaking on historic properties within the area of potential effect (36 CFR 800.5); and
- Resolve adverse effects (36 CFR 800.6).

Adverse effects on historic properties are often resolved through preparation of a Memorandum of Agreement or Programmatic Agreement developed in consultation between the federal agency, the

SHPO, Indian tribes, and interested members of the public. The ACHP is also invited to participate. The agreement describes stipulations to mitigate adverse effects on historic properties listed in or eligible for the National Register (36 CFR 60).

National Register of Historic Places. The National Historic Preservation Act established the National Register as “an authoritative guide to be used by federal, state, and local governments, private groups and citizens to identify the Nation’s historic resources and to indicate what properties should be considered for protection from destruction or impairment” (36 CFR Section 60.2). The National Register recognizes both historic-era and prehistoric archaeological properties that are significant at the national, state, and local levels.

To be eligible for listing in the National Register, a resource must be significant in American history, architecture, archaeology, engineering, or culture. Buildings, structures, objects, sites or districts of potential significance must meet one or more of the following four established criteria (NPS, 1990):

A. Are associated with events that have made a significant contribution to the broad patterns of our history;
B. Are associated with the lives of persons significant in our past;
C. 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. Have yielded, or may be likely to yield, information important in prehistory or history.

Unless the property possesses exceptional significance, it must be at least 50 years old to be eligible for National Register listing (NPS, 1990). In addition to meeting the criteria of significance, a property must have integrity. Integrity is defined as “the ability of a property to convey its significance” (NPS, 1990). The National Register recognizes seven qualities that, in various combinations, define integrity. To retain historic integrity a property must possess several, and usually most, of these seven (7) aspects. Thus, the retention of the specific aspects of integrity is paramount for a property to convey its significance. The seven factors that define integrity are location, design, setting, materials, workmanship, feeling, and association.

Although the National Register standards for historic integrity are high, the National Register accepts that a property “must also be judged with reference to the particular criteria under which a resource is proposed for eligibility.” Most archaeological properties are evaluated under Criterion D; the most applicable qualities of integrity under this criterion are those of location, materials, and association.

Integrity also defines the research potential of a resource. To possess research potential, archaeological data must have integrity in the form of what has been called “focus” (Deetz, 1977). Focus, in this context, means the accuracy with which the archaeological remains represent a situation or condition. When focus is absent or inadequate because of disturbance, a resource does not retain integrity. Remains that represent several activities or have materials that cannot be separated from one another into discrete contexts may also lack focus and therefore integrity.

State

California Environmental Quality Act: CEQA requires regulatory compliance for projects involving historic resources throughout the State. Under CEQA, public agencies must consider the effects of their actions on historic resources (Public Resources Code, Section 21084.1). The CEQA Guidelines define a significant resource as any resource listed in or determined to be eligible for listing in the California Register of Historical Resources ("California Register") [see Public Resources Code, Section 21084.1 and CEQA Guidelines Section 15064.5 (a) and (b)].

California Public Resources Code: Several sections of the California PRC protect cultural resources located on public land. Under PRC Section 5097.5, no person shall knowingly and willfully excavate upon, or remove, destroy, injure, or deface, any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site (including fossilized footprints), inscriptions made by human agency, rock art, or any other archaeological, paleontological, or historical feature situated on public lands, except with the express permission of the public agency that has jurisdiction over the lands. Violation of this section is a misdemeanor.

PRC Section 5097.98 states that if Native American human remains are identified within a project area, the landowner must work with the Native American Most Likely Descendant as identified by the NAHC to develop a plan for the treatment or disposition of the human remains and any items associated with Native American burials with appropriate dignity. These procedures are also addressed in Section 15064.5 of the State CEQA Guidelines. California Health and Safety Code Section 7050.5 prohibits disinterring, disturbing, or removing human remains from a location other than a dedicated cemetery. Section 30244 of the PRC requires reasonable mitigation for impacts on paleontological and archaeological resources that occur because of development on public lands.

California Health and Safety Code: California Health and Safety Code Section 7050.5 regulates the treatment of human remains. In the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site, or any nearby area reasonably suspected to overlie adjacent remains until the coroner of the county in which the human remains are discovered has determined that the remains are not subject to his or her authority. If the coroner recognizes the human remains to be those of a Native American or has reason to believe that they are those of a Native American, he or she shall contact the NAHC by telephone within 24 hours.

California Assembly Bill 52: AB 52, in effect since July 2015, provides CEQA protections for Tribal cultural resources. All lead agencies approving projects under CEQA are required, if formally requested by a culturally affiliated California Native American Tribe, to consult with such Tribe regarding the potential impact of a project on tribal cultural resources before releasing an environmental document. Under California Public Resources Code Sec. 21074, tribal cultural resources include site features, places, cultural landscapes, sacred places, or objects that are of cultural value to a Tribe and that are eligible for or listed on the California Register of Historic Resources or a local historic register, or that the lead agency has determined to be of significant tribal cultural value.

Local

Monterey County General Plan**:** The following policies are applicable to the Proposed Project.

Policy OS-7.1*:* Important representative and unique paleontological sites and features shall be identified and protected. Developers shall be required to complete Phase I (reconnaissance level) paleontological reviews in any formation known to yield important elements of the fossil record. If significant fossil deposits are found during grading activities, data recovery shall be required to obtain a sample of materials from such deposits prior to their systematic destruction.

Policy OS-7.4*:* Development proposed in low sensitivity zones are not required to have a paleontological survey unless there is specific additional information that suggests paleontological resources are present.

Policy OS-8.1*:* Unique burial sites shall be identified and protected. All Native Californian cemeteries, burials, shrine sites, and sacred place locations shall be preserved in place to the greatest extent possible and as permitted by law. In cases where such sites and locations cannot be retained in place without modification, governing requirements in the Government Code, Health and Safety Code, California Environmental Quality Act and Native American Religious Freedom Act shall be taken into account in consulting with local Native Californian Tribal Groups with documented aboriginal ties to the study area and shall be carried out, as necessary, with the assistance and input of the California Native American Heritage Commission. Documentation of descent shall be based on Genealogical Proof Standards.

Policy OS-8.3*:* Development proposed at sites where known burials or human cemeteries are located shall in no case modify, disturb, excavate, or develop in such locations until all steps in compliance with CEQA, Native American Heritage Commission, Health and Safety Code and Government Code, and in accordance with any completed MOU with a local Tribe, have been completed. Routine and Ongoing Agricultural Activities are exempted from this policy in so far as allowed by state or federal law. In the case of any conflict of interpretation, state requirements for the protection of burial sites are applicable and shall be implemented in good faith.

Policy OS-8.4*:* Policies and procedures shall be established that encourage development to avoid impacts to burial sites including:

a. Designing or clustering development to avoid archaeological deposits that typically contain human remains and to avoid any known cemeteries or other concentrations of human remains;
b. Requiring dedication of permanent conservation easements if subdivisions and other developments can be planned to provide for such protective easements;
c. In all cases where human remains are identified through CEQA review, archaeological research, ethnohistoric research, inadvertent grading disturbance, or historic record research, the County shall consult with the designated "most likely descendants" as identified by any Memorandum of Understanding ("MOU") adopted pursuant to Policy OS-8.7. In the event no MOU is executed, the Native American Heritage Commission shall be consulted to help determine the appropriate Tribal Group in that portion of the County where the burial remains are identified.

Policy OS-8.6*:* Tribal representatives will be consulted, consistent with state preservation law, about the location of sacred places, ancestral sites, archaeological remains of village sites, burial and cemetery sites, and other significant cultural resources during the preparation of any General Plan amendment, Master Plan, Community Plan, or Specific Plan.

Central Salinas County Area Plan**:** None of the policies provided in the CSCA are applicable to the Proposed Project.

City of Greenfield General Plan: The following policies are applicable to the Project.

Policy 7.6.1: Preserve areas that have been identifiable and important archaeological or paleontological significance.

Policy 7.6.A: Adopt the following conditions on all discretionary projects regarding the discovery of archaeological or paleontological resources:

- The Planning Department shall be notified immediately if any prehistoric archaeological, or paleontological artifact is uncovered during construction. All construction must stop and an archaeologist that meets the Secretary of the Interior's Professional Qualifications Standards in prehistoric or historical archaeology shall be retained to evaluate the finds and recommend appropriate action.
- All construction must stop, and the authorities notified in any human remains are uncovered. The County Coroner must be notified according to Section 7050.5 of the California's Health and Safety code. If the remains are determined to be Native American, the procedures outlined in CEQA Section 15064.5(d) and € shall be followed.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	■	☐	☐

Impact Discussion

a. Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5

CEQA Guidelines Sec. 15064.5 defines a historical resource as one being listed in or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources. Public Resources Code Section 21084.1 states 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. The Proposed Project would not cause a substantial change in the significance of a historical resource as defined by CEQA Guidelines Sec. 15064.5. The Proposed Project site does not contain any historic resources listed in the California Inventory of Historical Resources, California Historical Landmarks, or the National Register of Historic Places ("NRHP or National Register"). Therefore, the Proposed Project would not have an impact on a historical resource.

b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5

Section 21083.2 of the Public Resources Code requires lead agencies to assess potential impacts to archaeological resources and determine whether a project may cause a substantial adverse change in the significance of an archaeological resource. Albion conducted a records search at the NWIC, a Sacred Lands File search with the NAHC, and completed a visual inspection of the Proposed Project site. Additionally, Albion reviewed the Proposed Project site geology and soil characterizations. Albion did not observe archaeological resources, and none had been previously recorded. The review of the sites geology and soil suggested that overall, the area would not likely contain archaeological resources, as the Proposed Project site is extensively disturbed in connection with the development of existing WWTP facilities, and on-going disturbance associated with agricultural use of the areas proposed for future recycled water use. However, the adjacent Salinas River, a fresh water source, raises the possibility for discovery of "precolonial habitation sites" (Albion, 2024). Although, no evidence suggests the presence of habitation sites. Albion identified one (1) area of the Proposed Project site as archaeologically sensitive due to the presence of relatively stable floodplain deposits (Albion, 2024). Albion notes that this area would not be subject to earth disturbing activity. While unlikely, unrecorded archaeological resources could be present below ground surface and such resources could be exposed or damaged during construction. Therefore, to ensure impacts remain less than significant, the Proposed Project would implement **Mitigation Measure CUL-1**.

> **Mitigation Measure CUL-1**: To minimize potential impacts to unknown buried human remains to less than significant, the contractor will immediately halt work in the event of the discovery or recognition of any human remains. No further excavation or ground disturbing activities will occur at the site or nearby area suspected to overlie adjacent remains until the Monterey County coroner has been contacted in accordance with Section 7050.5 of the California Health and Safety Code. If the Coroner recognizes the human remains to be those of a Native American or has reason to believe that they are those of a Native American, the Coroner shall ensure that notification is provided to the NAHC within twenty-four hours of the determination, as required by California Health and Safety Code Section 7050.5(c) and PRC 5097. The NAHC shall identify the person or persons it believes to be most likely descended ("MLD") from the deceased Native American (PRC Section 5097.98). The designated MLD then has 48 hours from the time access to the property is granted to make recommendations concerning treatment of the remains (AB 2641). If the landowner does not agree with the recommendations of the MLD, the NAHC can mediate (Section 5097.94 of the Public Resources Code). If no agreement is reached, the landowner must rebury the remains where they will not be further disturbed (Section 5097.98 of the Public Resources Code). This will also include either recording the site with the NAHC or the appropriate Information Center; using an open space or conservation zoning designation or easement; or recording a document with the county in which the property is located (AB 2641). Work will not resume in the immediate area of the discovery until such time the remains have been appropriately removed from the site.

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

No known human remains, including those interred outside of formal cemeteries, are known to occur on the Proposed Project site. Additionally, Native Americans were consulted during the preparation of the Cultural Resources Report. The Proposed Project site is not a Sacred Lands site and the presence of known Native American remains were not identified during consultation. While the likelihood of human remains, including those interred outside of a formal cemetery, with the Proposed Project site is low, it is possible that previously unknown human remains may be present. Construction may impact previously unknown remains. To minimize potential impacts to less-than-significant, mitigation is necessary. The implementation of the following mitigation measure identified below would ensure potential adverse impacts would be reduced to less than significant.

> **Mitigation Measure CUL-2***:* If human remains are found at any time, work must be stopped and the Coroner must be notified immediately. If the Coroner determines that the remains are Native

American, the Native American Heritage Commission will be notified as required by law. The commission will designate a Most Likely Descendant who will be authorized to provide recommendations for management of the Native American human remains. (Ref. California Public Resources code Section 5097.98; and Health and Safety code Section 7050.5).

4.6 Energy

Environmental Setting

Pacific Gas and Electric ("PG&E") provides electricity and natural gas throughout Monterey County, and thus would be the energy utility provider of the Proposed Project site. Beginning in 2018, all PG&E customers in Monterey, San Benito, and Santa Cruz Counties were automatically enrolled in Central Coast Community Energy ("3CE"). 3CE is a locally controlled public agency providing carbon-free electricity to residents and businesses. 3CE is a joint powers authority and based on a local energy model called community choice energy. 3CE partners with PG&E, which continues to provide billing, power transmission and distribution, customer service, grid maintenance services, and natural gas services to Monterey County.

The Proposed Project would consist of the construction and operation of a new WWTP facility, and the subsequent demolition of the existing WWTP. Additionally, the Proposed Project would install recycled and water infrastructure, to store and use onsite and in the adjacent agricultural parcels. The Proposed Project would improve the performance of the existing WWTP to ensure the facility can accommodate future flows and comply with current water quality standards. **Table 4.6-1** illustrates the daily average and monthly net electricity use for the existing WWTP.

Table 4.6-1 Existing Wastewater Treatment Plant Energy Use (2023)

Month	Daily Average (kWh/day)	Net Usage (kWh)
January	1,832	54,967
February	1,600	48,020
March	1,497	47,931
April	1,573	47,217
May	1,396	10,188
June	1,307	40,539
July	1,295	40,167
August	4,475	42,777
September	1,638	52,419
October	1,799	53,977
November	1,904	55,236
December	1,904	60,516
Total (kWh/year)	**553,954**	

Source: City of Greenfield WWTP PG&E Billing.

At full utilization of the proposed WWTP and all of its infrastructure, the City could anticipate the new WWTP to require approximately 11,100,000 kilowatt hours per year ("kWh/year") (personal communication, HydroScience, February 1, 2024).

Regulatory Environment

State

***California Renewable Energy Standards*:** In 2002, California established their Renewables Portfolio Standard ("RPS") Program, with the goal of increasing the percentage of renewable energy in the State's electricity mix to 20 percent of retail sales by 2017 through enactment of Senate Bill ("SB") 1078 (CPUC, 2023). In 2006, SB 107 revised previous elements of the Public Utilities Code so the amount of renewable energy generated per year and sold to retail customers would amount to 20 percent by 2010 (SB 107, 2006). In 2008, the governor issued Executive Order S-14-08 and requires that retail sellers of electricity serve 33 percent of their load with renewable energy by 2020 (Governor Schwarzenegger, 2008). In October 2015, Governor Brown signed SB 350 to codify California's climate and clean energy goals. A key provision of SB 350 requires retail sellers and publicly owned utilities to procure 50 percent of the State's electricity from renewable sources by 2030 (CPUC, 2023).

***California Building Codes*:** At the State level, the California Legislature established the Energy Efficiency Standards for Residential and Nonresidential Buildings, as specified in Title 24, Part 6, of the California Code of Regulations (Title 24), in 1978 in response to a legislative mandate to reduce California's energy consumption. Title 24 is updated approximately every three years. Compliance with Title 24 is mandatory at the time new building permits are issued by city and county governments. The California Green Building Standards Code ("CalGreen") establishes mandatory green building standards for all buildings in California. The code covers five categories: planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and indoor environmental quality. Title 24 was last updated in 2022.

Local

Monterey County General Plan: The following policy is applicable to the Proposed Project.

Policy OS-9.6: Development shall incorporate features that reduce energy used for transportation, including pedestrian and bicycle pathways, access to transit, and roadway design as appropriate.

***Central Salinas County Area Plan*:** None of the policies provided in the CSCA are applicable to the Proposed Project.

City of Greenfield General Plan: The City of Greenfield General Plan does not address energy resources and therefore policies are not available.

***City of Greenfield Municipal Code Section 15.04.110 Green Building Policy*:** At the local level, the City has adopted the California Green Building Standards Code of Regulations, as promulgated by the California Building Standards Commission, and published by the International Code Council which sets green building standards for municipal development. These regulations are set to significantly reduce greenhouse gas emissions and energy consumption. General Plan Policies have been adopted for the purpose of avoiding or mitigating energy impacts from development projects. Policies applicable to the Project are presented below.

Policy 2.8.7 – Future development shall be encouraged to demonstrate environmental sensitivity to site planning and construction.

Policy 2.8.G – Provide developer incentives to encourage incorporation of "Green Building" technology and materials into private public projects.

Policy 8.5.1 – Support the reduction of air pollutants through land use, transportation, and energy use planning.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	■	☐	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	■	☐

Impact Discussion

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

The Proposed Project would not result in a potentially significant environmental effect due to the wasteful, inefficient, or unnecessary consumption of energy, or wasteful use of energy resources, during construction or operation of the Proposed Project. Energy use associated with the Proposed Project would not constitute an adverse effect under CEQA.

Construction

Construction of the Proposed Project would require energy for the procurement and transportation of materials and preparation of the Project site (e.g., grading, materials hauling). Petroleum-based fuels such as diesel fuel and gasoline would be the primary sources of energy for these activities. At the time this IS/MND was prepared, a construction schedule was not yet available. Therefore, construction energy was not quantifiable. However, the Proposed Project would not likely cause inefficient, wasteful, or unnecessary consumption of energy because; 1) the construction schedule and phased approach is designed to be efficient to avoid excess monetary costs, and 2) energy demand associated with construction would be temporary in nature.

Operation

The Proposed Project would generate energy demand associated with the operation of the WWTP facilities and employee vehicle traffic to and from the site. The increase demand in operational energy associated with the operation of the Proposed Project would not cause a significant impact due to wasteful, inefficient, or unnecessary consumption of energy, or wasteful use of energy resources. However, the increase in operational energy use would be substantially greater than the existing use.

The Proposed Project consists of the operation of a new WWTP that would replace the existing WWTP. The existing WWTP consumes 553,954 kWh/year of energy on average. While the new WWTP would accommodate flows between 2.52 mgd and 3.00 mgd and therefore all full operation could require approximately 11,110,000 kWh/year of energy at full utilization of the proposed WWTP facilities, 365 days a year, 24 hours a day; the City anticipates operational influent flows to be consistent with existing flow rates which range between 1.0 mgd and 1.3 mgd, and that all of the proposed WWTP facilities would be used intermittently. Moreover, the new WWTP is only permitted to receive 2.0 mgd of wastewater. Therefore, while the new WWTP could, at full operational capacity, require substantially more energy, it is more likely that it would require between 3,330,000 kWh/year to 5,550,000 kWh/year (30% to 50% of the full operational usage). Regardless of the influent flows, operation of the Proposed Project would still result in an increase to energy use. The Proposed Project would comply with applicable energy efficiency standards.

In addition to operation energy, the Proposed Project would also increase the number of employees necessary for on-going maintenance activities (a total of six (6)- eight (8) employees). The increase of employee vehicles trips would not significantly increase energy use as compared to existing operations.

While the Proposed Project would substantially increase onsite energy use beyond current levels, this increase would not constitute the wasteful, inefficient, or unnecessary consumption of energy. The energy required would be the minimum amount necessary to operate the Proposed Project. As discussed throughout this IS/MND, the Proposed Project is necessary to meet the City's wastewater needs and to ensure future flows are accommodated and water quality standards are met and maintained. Moreover, design and implementation of mitigation measures identified throughout this IS/MND would ensure impacts remain less than significant.

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

The Proposed Project would have a less than significant impact related to energy usage and efficiency. Construction and operation of the Project would be subject to existing state energy standards and would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

4.7 Geology and Soils

Environmental Setting

Earth Systems prepared a Geotechnical Engineering and Engineering Geology Report for the Proposed Project, dated March 31, 2023. The following discussion relies on Earth Systems' findings (see **Appendix C**). The geologic structure in central California is primarily the result of tectonic events during the past 30 million years. Conventional knowledge stipulates that the numerous faults in this area are due to movements along the boundary between the Pacific and North American tectonic plates. The relative motion between these two (2) tectonic plates occurs along the northwest-trending San Andreas fault system, which defines the regional boundary between the two (2) plates. Changes in sea level and tectonic uplift result in a complicated depositional environment that produced the Monterey Bay region's complex geology. Faulting and folding deformed and displaced the geologic units in the region, and the granitic basement and overlying Tertiary deposits have been juxtaposed along many of the northwest/southeast-trending faults.

The Proposed Project is primarily located in the City of Greenfield. However, a portion of the Proposed Project site is in unincorporated Monterey County, California. The Proposed Project is located in the Salinas Valley, an alluvial basin that lies between the Gabilan Mountain Range to the east and the Santa Lucia Mountain Range to the west. The City of Greenfield is in a seismically active region. As a result, the Proposed Project could be subject to seismically induced hazards during its design lifetime.

The City of Greenfield is on very flat land that gently slopes east and comprised primarily of Arroyo Seco Gravelly Sandy Loam, Cropley Silty Clay, Elder Sandy Loam, and Xerothents (City of Greenfield, 2005). The California Soil Web Map produced by the University of California Davis identifies the Proposed Project site as being composed of *Metz/Metz Complex*, *Pico*, and *Dune Land* (see **Figure 12**). *Metz/Metz Complex* is composed of finely sandy loam that form in alluvial material from sedimentary rocks. This soil type has excessive drainage characteristics, and low runoff potential. The composition of this soil type is suitable for agriculture, wastewater treatment, irrigation. *Pico* is a deep, well-drained soil type that is formed in alluvium sedimentary rocks (i.e., associated with floodplains and alluvial fans). Pico soils are primarily composed of sandy loam. Suitable use include agriculture, wastewater treatment, irrigation. *Dune Land* is composed of quartz and feldspar eolian sands that have low runoff and excessive drainage characteristics. The composition of this soil type makes it suitable for uses including, but not limited to, agriculture, irrigation, and irrigation disposal and slow rate process treatment of wastewater.

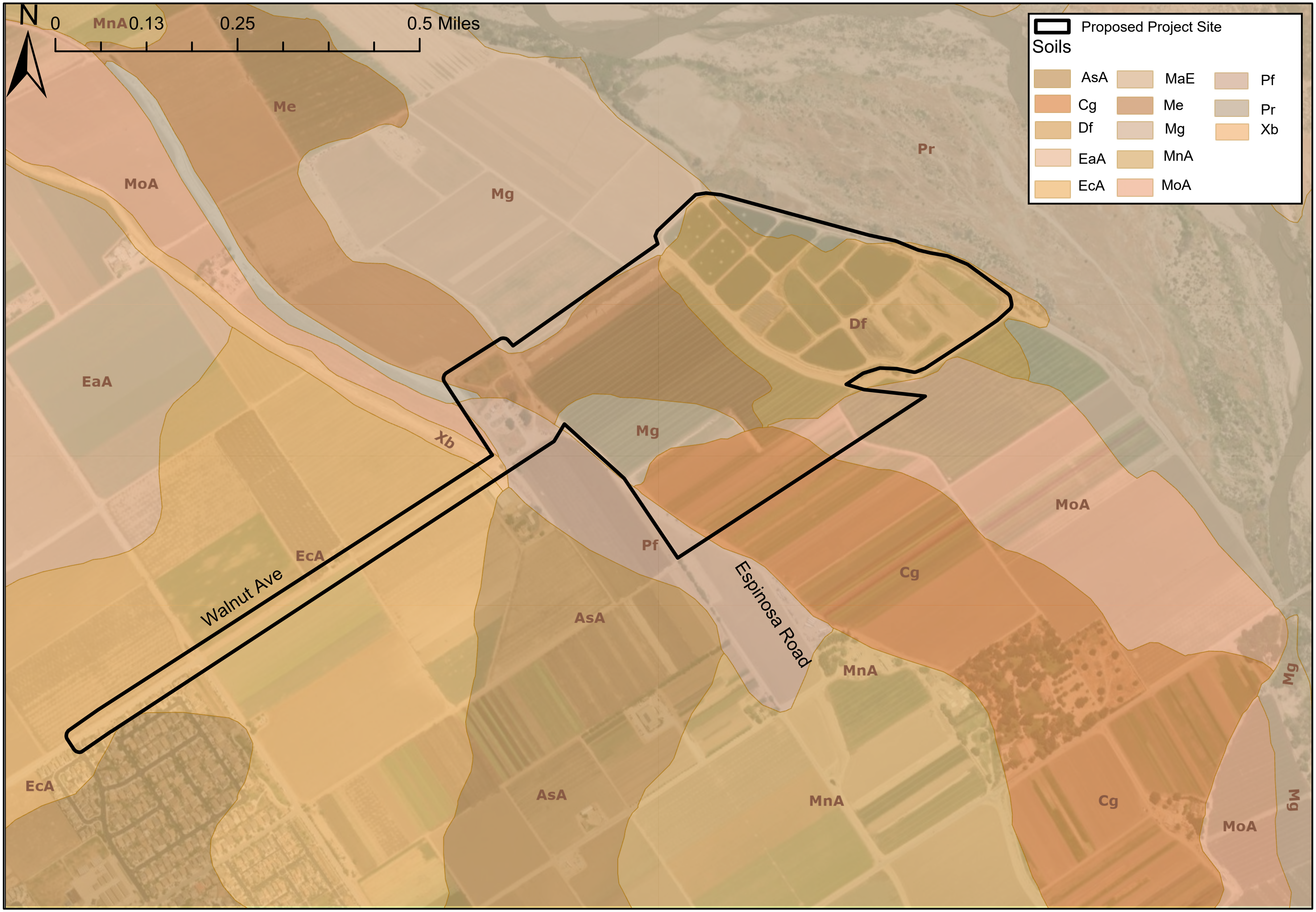
Regulatory Environment

Federal

National Earthquake Hazards Reduction Program**:** Implemented by FEMA, the National Earthquake Hazards Reduction Program (“NEHRP”) pursues research, development, and implementation of earthquake mitigation measures. Passed in 1977, NEHRP is a collaborative effort between federal, state, local governments, universities, research centers, professional societies, trade associations, and businesses. FEMA is the primary agency implementing the research and development of earthquake measures and safety materials. Implementation of these measures and materials is accomplished through the following:

- Providing federal grant programs for states and local governments to implement earthquake mitigating measures;
- engaging businesses, through the QuakeSmart program;
- providing Multi-State National Earthquake Assistance grants for public education of mitigation activities;
- collaborating with universities and non-profit organizations to encourage enforcement of building codes and use of seismic rehabilitation at a regional level;
- training for earthquake readiness and mitigation through National Earthquake Technical Assistance Program;
- providing educational materials and research reports through the FEMA Library.

NEHRP has no regulatory authority and therefore cannot enforce national earthquake standards. All the program’s provisions are incumbent upon the state, local government, and business to adopt as appropriate (FEMA, 2023; Locascio 2023).



Soil Map

Date
2/13/2024

Scale
N/A

Denise Duffy & Associates, Inc.
PLANNING AND ENVIRONMENTAL CONSULTING

Figure
12

State

***Alquist-Priolo Earthquake Fault Zoning Act*:** The Alquist-Priolo Earthquake Fault Zoning Act, passed in 1972, seeks to mitigate surface faulting's hazard to structures for human occupancy. In accordance with this act, the State Geologist established regulatory zones, called “earthquake fault zones,” around the surface traces of active faults and published maps showing these zones. In these zones, buildings for human occupancy cannot be constructed across the surface trace of active faults. Because many active faults are complex and consist of more than one branch, each earthquake fault zone extends approximately 200 to 500 feet on either side of the mapped fault trace.

Title 14 of the CCR, Section 3601(e), defines buildings intended for human occupancy as those that would be inhabited for more than 2,000 hours per year. The Proposed Project does not cross an Alquist-Priolo Earthquake Fault Zone. Therefore, these provisions of the Act do not apply to the Proposed Project.

Seismic Hazards Mapping Act: The purpose of the Seismic Hazards Mapping Act of 1990 (PRC Sections 2690–2699.6) is to reduce damage resulting from earthquakes. The Seismic Hazards Mapping Act addresses earthquake-related hazards, including strong ground shaking, liquefaction, and seismically induced landslides. The state is charged with identifying and mapping areas at risk of strong ground shaking, liquefaction, landslides, and other corollary hazards. Cities and counties are required to regulate development in mapped Seismic Hazard Zones. Under the Seismic Hazards Mapping Act, permit review is the primary mechanism for local regulation of development. Specifically, cities and counties are prohibited from issuing development permits for sites in Seismic Hazard Zones until appropriate site-specific geologic and/or geotechnical investigations have been conducted and measures to reduce potential damage have been incorporated into the development plans.

Local

***Monterey County General Plan*:** Relevant policies are listed below.

Policy S-1.3 – Site-specific geologic studies may be used to verify the presence or absence and extent of the hazard on the property proposed for new development and to identify mitigation measures for any development proposed. An ordinance including permit requirements relative to the siting and design of structures and grading relative to seismic hazards shall be established.

Policy S-1.4 – The Alquist-Priolo Earthquake Fault Zoning Act shall be enforced.

***Central Salinas County Area Plan*:** None of the policies provided in the CSCA are applicable to the Proposed Project.

***City of Greenfield General Plan*:** Policies in the City of Greenfield General Plan have been adopted for the purpose of avoiding or mitigating geologic resource impacts. The following policies are applicable to the Project.

Policy 8.1.1 – Existing and new buildings, structures, and walls in the City shall meet minimum seismic safety standards.

Policy 8.1.2 – Projects in areas of potential significant seismic activity shall provide detailed geologic, geologic-seismic and soils studies by a registered geologist, certified engineering geologist, and/or geotechnical engineer to evaluate geologic-seismic and soils conditions as well as ground shaking and liquefaction.

Policy 8.1.3 – The development of structures in areas of high liquefaction potential shall be contingent on geologic and engineering studies which 1) define and delineate potentially hazardous geologic and/or soil conditions, 2) recommend means of mitigating these adverse conditions; and 3) provide implementation of the mitigation measures.

Policy 8.1.4 – All new buildings, structures, and walls shall conform to the latest seismic and geologic safety structural standards of the California Building Code.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	☐	☐	■
ii) Strong seismic ground shaking?	☐	☐	■	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	■	☐
iv) Landslides?	☐	☐	■	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	■	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	■	☐
d) Be located on expansive soil, as defined in Chapter 18A of the 2007 California Building Code, creating substantial 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 paleontological resource or site or unique geologic feature?	☐	☐	☐	■

Impact Discussion

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

a.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?

The Proposed Project is not located in an Alquist-Priolo Earthquake Fault Zone. No impact would occur.

a.ii) Strong-seismic ground shaking?

The Proposed Project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death from strong seismic ground shaking. The Proposed Project site is in a seismically active region. The nearest active faults include the Rinconada, Reliz, and San Andreas (Earth Systems, 2023). As a result, the Proposed Project could be subject to seismically induced hazards during its design lifetime. To minimize potential seismically induced hazards, the Proposed Project would be designed to comply with all standard engineering and seismic safety design requirements and guidelines contained in the Uniform Building Code and California Building Code (Earth Systems, 2023). Additionally, the final design of the Proposed Project would be required to comply with the recommendations of a design-level geotechnical analysis. Compliance with existing building code requirements, as well as the recommendations of a design-level geotechnical report would ensure that potential impacts would be minimized. This impact is less than significant.

a.iii) Seismic-related ground failure, including liquefaction?

The Proposed Project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death from seismic-related ground failure, including liquefaction. Earth Systems concluded that surface ground rupture occurs at sites that are traversed by or lie very near to a causative fault. The Project is not located in any mapped earthquake fault zones. Therefore, there is a low potential for surface ground rupture. The County of Monterey identifies the Proposed Project site as an area of moderate to high liquefaction susceptibility, which is consistent with Earth Systems' findings. To ensure impacts because of seismic related ground failure, including liquefaction is minimized, the Proposed Project would be designed and constructed in accordance with standard engineering and seismic safety design techniques contained in the Uniform Building Code and California Building Code. Moreover, the Proposed Project would be required to comply with the recommendations of the design-level geotechnical analysis. This impact is less than significant.

a.iv) Landslides?

Landslides are common in Monterey County due to the combination of uplifting mountains, fractured and weak rocks, and periodic intense rainfall along the coast. The level of susceptibility of an area is dependent on the local geologic conditions. The Proposed Project site is in an area of low landslide susceptibility (Monterey County, 2023). As a result, the Proposed Project is unlikely to be exposed to potential landslide hazards. Regardless, the Project would be designed and constructed in accordance with standard engineering and seismic safety design techniques. Moreover, the Proposed Project would be required to comply with the recommendations design-level geotechnical analysis. Because the site is unlikely to be subject to potential landslide related hazards and final design would be completed in conformance with a design-level geotechnical analysis, this impact is less than significant.

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

The Proposed Project site has primarily low erosion potential, with areas of moderate to high erosion potential at the eastern half of the Project site (i.e., area closest to the Salinas River) (Earth Systems, 2023). Where the most intensive grading and excavation would occur, the site is classified as having low erosion susceptibility. Moreover, the soil in the western portion of the Proposed Project site (i.e., where grading and excavation would occur) is characterized as being excessively drained and having low erodibility (Earth Systems, 2023 and NRCS, 2023). To ensure impacts remain less than significant, the Proposed Project would be designed and constructed in accordance with standard engineering and seismic safety design techniques contained in the Uniform Building Code and California Building Code (Earth Systems, 2023). Moreover, the Proposed Project would be required to comply with the recommendations design-level geotechnical analysis. This impact is less than significant.

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

The Proposed Project is not located on a geologic unit or soil that is unstable, or that would become unstable because of the Proposed Project, and potentially result in on-or-off site landslide, lateral spreading, subsidence, liquification, or collapse. While the Proposed Project is located on soils with varying degrees of liquification and erosion potential, the Proposed Project would be designed and constructed in accordance with standard engineering requirements contained in the Uniform Building Code and California Building Code (Earth Systems, 2023). Moreover, the Proposed Project would be required to comply with the recommendations design-level geotechnical analysis. This impact is less than significant.

d. Be located on expansive soil, as defined in Chapter 18A of the 2007 California Building Code, creating substantial risks to life or property?

The Proposed Project would not be located on expansive soil creating substantial risks to life or property. Earth Systems evaluated the soil onsite and found it to be non-expansive. No impact would occur.

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?

The Proposed Project site does not have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal system where sewers are not available for the disposal of wastewater. The Proposed Project does not include the use of septic tanks or alternative wastewater disposal system, therefore there would be no impact. However, the Proposed Project does include the use of recycled water on adjacent agriculture fields. Pacific Crest Engineering Inc. conducted infiltration (percolation) testing on an adjacent agricultural parcel (APN 109-031-014-000) in August 2023 (see **Appendix D**). The percolation tests were conducted to ensure that soils within the surrounding agricultural parcels had sufficient infiltration rates to support the disposal of recycled water. Pacific Crest concluded that the adjacent agricultural parcels, would have soils capable of adequately supporting the use of alternative wastewater disposal systems. As depicted in **Figure 12**, the Proposed Project site and adjacent agricultural fields contain soils with moderate to excessively drained soils (NRCS, 2023). Therefore, Pacific Crest's findings of suitability would be applicable to adjacent agricultural parcels that are of similar soil composition with APN 109-031-014-000. No impact would occur.

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

The Proposed Project would not directly or indirectly destroy a paleontological resource or site or unique geologic feature. Significant paleontological resources are fossils or assemblages of fossils that are unique, unusual, rare, uncommon, and diagnostically or stratigraphically important, as well as those that add to an existing body of knowledge in specific areas, stratigraphically, taxonomically, or regionally. They include fossil remains of large to very small aquatic and terrestrial vertebrates, remains of plants and animals previously not represented in certain portions of the stratigraphy and assemblages of fossils that might aid stratigraphic correlations – particularly those offering data for the interpretation of tectonic events, geomorphologic evolution, paleoclimatology, and the relationships of aquatic and terrestrial species. Most of the fossils found in Monterey county are of marine life forms and form a record of the region's geologic history of advancing and retreating sea levels. A review of nearly 700 known fossils localities in the County was conducted in 2001; 12 fossil sites were identified as having outstanding scientific value. The Proposed Project site is not located on or near any of those sites. No impact would occur.

4.8 Greenhouse Gas Emissions

Environmental Setting

Global temperatures are affected by naturally occurring and anthropogenic-generated atmospheric gases, such as water vapor, carbon dioxide, methane, and nitrous oxide (Intergovernmental Panel on Climate Change, 2007). Gases that trap heat in the atmosphere are called greenhouse gases ("GHGs"). Solar radiation enters the earth's atmosphere from space, and a portion of the radiation is absorbed at the surface. The earth emits this radiation back toward space as infrared radiation. Greenhouse gases, which are mostly transparent to incoming solar radiation, are effective in absorbing infrared radiation and redirecting some of this back to the earth's surface. As a result, radiation that otherwise would have escaped back into space is retained, resulting in a warming of the atmosphere. This process is known as the greenhouse effect. The greenhouse effect helps maintain a habitable climate. Emissions of GHGs from human activities, such as electricity production, motor vehicle use, and agriculture, are elevating the concentration of GHGs in the atmosphere. GHG emissions from Anthropogenic sources are causing a trend of unnatural warming of the earth's climate, known as global warming or global climate change.

Climate change has a cumulative impact; a project contributes to this impact through its incremental contribution of GHG emissions combined with the cumulative increase of all other sources of GHGs. The MBARD defines their GHG threshold in terms of carbon dioxide equivalent ("CO_2e"), a metric that accounts for emissions from various GHGs based on their global warming potential. If annual emissions of GHGs exceed these threshold levels, the Proposed Project would result in a cumulatively considerable contribution of GHG emissions and must implement mitigation measures (MBARD, 2016). MBARD has not yet adopted a threshold for construction-related GHG emissions but recommends utilizing thresholds set by neighboring districts (e.g., Sacramento Metropolitan Air Quality Management District ["SMAQMD"]). SMAQMD adopted an updated threshold based on the 2030 target year in April 2020. Based on correspondence with MBARD staff, utilizing this threshold would be appropriate. Therefore, the Proposed Project would result in a significant construction GHG related impact if the Proposed Project would emit more than 1,100 metric tons of CO_2e ("$MTCO_2e$") per year (SMAQMD, 2020). Conversely, if a project emits less than 1,100 $MTCO_2e$, the Proposed Project would have a less than significant GHG related impact. The Proposed Project would result in a significant operational GHG related impact if the Proposed Project would emit more than 10,000 $MTCO_2e$.

Regulatory Environment

Federal

Federal Regulation and the Clean Air Act - Executive Order 13514**:** Executive Order 13514 is focused on reducing GHGs internally in federal agency missions, programs, and operations. Additionally, the executive order directs federal agencies to participate in the Interagency Climate Change Adaptation Task Force, which is engaged in developing a national strategy for adaptation to climate change.

On April 2, 2007, in Massachusetts v. U.S. EPA, 549 U.S. 497 (2007), the Supreme Court found that GHGs are air pollutants covered by the FCAA and that the U.S. EPA has the authority to regulate GHG. The Court held that the U.S. EPA Administrator must determine whether emissions of GHGs from new motor vehicles cause or contribute to air pollution which may be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision.

On December 7, 2009, the U.S. EPA Administrator signed two (2) distinct findings regarding GHGs under section 202(a) of the Clean Air Act:

- Endangerment Finding: The Administrator found that the current and projected concentrations of the six (6) key well-mixed GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) in the atmosphere threaten the public health and welfare of current and future generations.
- Cause or Contribute Finding: The Administrator found the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution which threatens public health and welfare.

Although these findings did not impose any requirements on industry or other entities, this action was a prerequisite to finalizing the U.S. EPA's *Proposed Greenhouse Gas Emission Standards for Light-Duty Vehicles* published on September 15, 2009. On May 7, 2010, the final *Light-Duty Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards* was published in the Federal Register.

U.S. EPA and the National Highway Traffic Safety Administration ("NHTSA") are taking coordinated steps to enable the production of a new generation of clean vehicles with reduced GHG emissions and improved fuel efficiency from on-road vehicles and engines. These next steps include developing the first-ever GHG regulations for heavy-duty engines and vehicles and additional light-duty vehicle GHG regulations. President Obama outlined these steps in a Presidential Memorandum on May 21, 2010.

The final combined U.S. EPA and NHTSA standards making up the first phase of this national program apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. The standards require these vehicles to meet an estimated combined average emissions level of 250 grams of Carbon dioxide ("CO_2") per mile (the equivalent to 35.5 miles per gallon if the automobile industry were to meet this CO_2 level solely through fuel economy improvements). Together, these standards will cut GHG emissions by an estimated 960 million metric tons ("MMT") and

1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012-2016). On August 28, 2012, U.S. EPA and NHTSA issued their joint rule to extend this national program of coordinated GHG and fuel economy standards to model years 2017 through 2025 passenger vehicles.

State

Assembly Bill 32 – California Global Warming Solutions Act: AB 32, the Global Warming Solutions Act of 2006, codifies the State of California's GHG emissions target by directing CARB to reduce the state's global warming emissions to 1990 levels by 2020. Governor Schwarzenegger signed and passed into law AB 32 on September 27, 2006. Since that time, the CARB, the California Energy Commission ("CEC"), the California Public Utilities Commission ("CPUC"), and the Building Standards Commission ("BSC") have all been developing regulations that will help meet the goals of AB 32 and Executive Order S-3-05.[8]

A Scoping Plan for AB 32 was adopted by CARB in December 2008. It contains the State of California's main strategies to reduce GHGs from business as usual ("BAU") emissions projected in 2020 back down to 1990 levels. BAU is the projected emissions in 2020, including increases in emissions caused by growth, without any GHG reduction measures. The Scoping Plan has a range of GHG reduction actions, including direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms such as a cap-and-trade system. This plan required CARB and other state agencies to develop and adopt regulations and other initiatives reducing GHGs by 2012.

As directed by AB 32, CARB has also approved a statewide GHG emissions limit. On December 6, 2007, CARB staff resolved an amount of 427 MMT of CO_2e as the total statewide GHG 1990 emissions level and 2020 emissions limit. The limit is a cumulative statewide limit, not a sector-or facility-specific limit. CARB updated the future 2020 BAU annual emissions forecast because of economic downturn, to 545 MMT of CO_2e. Two (2) GHG emissions reduction measures currently enacted that were not previously included in the 2008 Scoping Plan baseline inventory were included, further reducing the baseline inventory to 507 MMT of CO_2e. Thus, an estimated reduction of 80 MMT of CO_2e is necessary to reduce statewide emissions to meet the AB 32 target by 2020.

CARB prepared an updated Scoping Plan which was released in 2017. The 2017 Scoping Plan identifies ways for California to reach the statewide 2030 climate target and next steps for reaching the 2050 target goal.

Senate Bill 1368: SB 1368 is the companion bill of AB 32 and was signed by Governor Schwarzenegger in September 2006. SB 1368 required the CPUC to establish a greenhouse gas emission performance standard. Therefore, on January 25, 2007, the CPUC adopted an interim GHG Emissions Performance Standard to help mitigate climate change. The Emissions Performance Standard is a facility-based emissions standard requiring all new long-term commitments for baseload generation to serve California consumers be with power plants that have emissions no greater than a combined cycle gas turbine plant. That level is established at 1,100 pounds of CO_2 per megawatt-hour. "New long-term commitment" refers to new plant investments (new construction), new or renewal contracts with a term of five (5) years or more, or major investments by the utility in its existing baseload power plants. Additionally, the CEC established a similar standard for local publicly owned utilities that cannot exceed the greenhouse gas emission rate from a baseload combined-cycle natural gas fired plant. On July 29, 2007, the Office of

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[8] Note that AB 197 was adopted in September 2016 to provide more legislative oversight of CARB.

Administrative Law disapproved the CEC's proposed Greenhouse Gases Emission Performance Standard rulemaking action and subsequently, the CEC revised the proposed regulations. SB 1368 further requires that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the CPUC and CEC.

***Senate Bill 350 – Clean Energy and Pollution Reduction Act*:** In September 2015, the California Legislature passed SB 350 (de Leon 2015), which increases the State's RPS for content of electrical generation from the 33 percent target for 2020 to a 50 percent renewables target by 2030.

***Executive Order S-03-05*:** On June 1, 2005, Governor Schwarzenegger signed Executive Order S-03-05, the purpose of which was to implement requirements for the California Environmental Protection Agency ("CalEPA") to provide ongoing reporting on a biennial basis to the State Legislature and Governor's Office on how global warming is affecting the state. Required areas of impact reporting include public health, water supply, agriculture, coastline, and forestry. The CalEPA secretary is required to prepare and report on ongoing and upcoming mitigation designed to counteract these impacts.

***Executive Order B-30-15*:** On April 15, 2015, Governor Brown signed Executive Order B-30-15, the purpose of which is to establish a GHG reduction of 40 percent below 1990 levels by 2030. The Executive Order intended to help the state work towards a further emissions reduction target of 80 percent below 1990 levels by the year 2050. The order directed state agencies to prepare for climate change impacts through prioritization of adaptation actions to reduce GHG emissions, preparation for uncertain climate impacts through implementation of flexible approaches, protection of vulnerable populations, and prioritization of natural infrastructure approaches.

***Executive Order B-55-18 and SB 100 – 100 Percent Clean Energy Act of 2018*:** On September 10, 2018, Governor Brown signed both SB 100 – 100 Percent Clean Energy Act of 2018 and Executive Order B-55-18 to Achieve Carbon Neutrality. SB 100 sets California on course to achieving carbon-free emissions from the electric power production sector by 2045. SB 100 also increases the required emissions reduction generated by retail sales to 60 percent by 2030, an increase of 10 percent compared to previous goals. B-55-18 establishes a new goal of achieving statewide "carbon neutrality as early as possible and no later than 2045, and to achieve and maintain net negative emissions thereafter" (Governor Brown, 2018).

***California Building Code*:** The California Building Code ("CBC") contains standards regulating the method of use, properties, performance, or types of materials used in the construction, alteration, improvement, repair, or rehabilitation of a building or other improvement to real property. The CBC is adopted every three years by the BSC. In the interim, the BSC also adopts annual updates to make necessary mid-term corrections. The CBC standards apply statewide. However, a local jurisdiction may amend a CBC standard if it makes a finding the amendment is reasonably necessary due to local climatic, geological, or topographical conditions.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	☐	■	☐

Impact Discussion

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

Construction

The Proposed Project would not generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment. The Proposed Project is in the NCCAB, where MBARD regulates air quality. As discussed above, if a project emits less than 1,100 $MTCO_2e$ per year, its GHG emissions impact would be less than significant. Based on the construction details described in **Chapter 2. Project Description**, an air quality evaluation was prepared for the Proposed Project (see **Appendix A**). The Proposed Project would require substantial earth moving but would be constructed over the course of two (2) years. Based on the typical construction equipment utilized for projects similar to the Proposed Project, and the phased approach to construction, 630 $MTCO_2e$ per year of GHG would be generated by construction of the Proposed Project. Construction would be temporary in nature, and emissions would be further minimized with implementation of **Mitigation Measure AQ-1**, and the BMPs which reduce energy consumption during construction and therefore reduce emissions that contribute to GHG. For these reasons, this impact is less than significant with mitigation.

Operation

Operation of the Proposed Project would not generate GHG emissions that exceed the MBARD threshold. As depicted in the air quality analysis (see **Appendix A**), the Proposed Project would generate 1,143 $MTCO_2e$ per year[9] of GHG. GHG generated by the Proposed Project would primarily be associated with the energy demand to operate the WWTP, and vehicle use. The Proposed Project would be required to comply with current building code requirements and include energy efficient improvements which would further ensure that potential operational energy demand would be minimized (see **Section 4.6, Energy** for more detail). As discussed in **Section 4.13 Transportation**, the Proposed Project would not result in a significant increase in operational traffic trips. However, new daily trips would be below the 110 daily trip threshold, even with an increase in operational traffic (e.g., maintenance, deliveries, etc.). The increase would not result in a significant impact, and therefore this impact is less than significant.

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[9] Operation emissions are amortized over 30 years.

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

As described above, the Proposed Project is not expected to generate GHG emissions that would exceed applicable thresholds. Therefore, the Proposed Project would not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases. This represents a less than significant impact.

4.9 Hazards and Hazardous Materials

Environmental Setting

Hazardous materials, as defined by the California Code of Regulations, are substances with certain physical properties that could pose a substantial present or future hazard to human health or the environment when improperly handled, disposed, or otherwise managed. Hazardous waste is any hazardous material that is discarded, abandoned, or slated to be recycled. Hazardous materials and waste can result in public health hazards if improperly handled, released into the soil or groundwater, or through airborne releases in vapors, fumes, or dust. Soil and groundwater having concentrations of hazardous constituents higher than specific regulatory levels must be handled and disposed of as hazardous waste when excavated or pumped from an aquifer.

Government Code Section 65962.5 requires CalEPA to develop a Cortese List that is updated at least annually. While CalEPA no longer maintains a single Cortese List, CalEPA uses the following database and list to meet the requirements of Government Code Section 65962.5.

- List of Hazardous Waste and Substances sites from Department of Toxic Substances Control (“DTSC”) EnviroStor database.
- List of Leaking Underground Storage Tank (“LUST”) Sites from the State Water Board’s GeoTracker database.
- List of solid waste disposal sites identified by State or Regional Water Board with waste constituents above hazardous waste levels outside the waste management unit.
- List of “active” Cease and Desist Orders (“CDO”) and Clean-up and Abatement Orders (“CAO”) from State Water Board.
- List of hazardous waste facilities subject to corrective action pursuant to Section 25187.5 of the Health and Safety Code, identified by DTSC.

In addition to these databases, the State Water Board and the DTSC maintain databases of other hazardous material release sites with documented environmental contamination (GeoTracker, 2023 and EnviroStor, 2023). The DTSC regulatory search was conducted to identify if the Project site is listed in any hazardous materials release databases. The Proposed Project site was listed on the State Water Resources Control Board GeoTracker webpage. Moreover, the City of Greenfield General Plan identifies the WWTP as being a site with potential of being a significant hazard as accidental spills could result in noxious gases, bad odors, and pollution. No additional hazardous material sites were identified as being located on or in the vicinity of the Proposed Project site.

Regulatory Environment

Federal

Environmental Protection Agency: The EPA is responsible for enforcing regulations at the federal level pertaining to hazardous materials and wastes. The primary federal hazardous materials and wastes laws are contained in the Resources Conservation and Recovery Act ("RCRA") of 1976 and in the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA") of 1980.

Comprehensive Environmental Response, Compensation and Liability Act: CERCLA, more commonly known as Superfund, established the National Priorities List for identifying and obtaining funding for remediation of severely contaminated sites. Federal regulations pertaining to hazardous materials and wastes are contained in the Code of Federal Regulations (40 CFR). The regulations contain specific guidelines for determining whether a waste is hazardous, based on either the source of generation or the characteristics of the waste.

U.S. Department of Transportation: The U.S. Department of Transportation ("DOT") regulates transportation of hazardous materials by truck and rail. DOT regulations establish criteria for safe handling procedures. The California Administrative Code also includes federal safety standards.

***Solid Waste Disposal Act/Federal Resource Conservation and Recovery Act*:** RCRA manages solid waste, landfills, and medical wastes. Under this act, solid wastes include hazardous materials. The act provides provisions for the generation, storage, treatment, and disposal of hazardous waste.

Toxic Substances Control Act: The Toxic Substances Control Act ("TSCA"), passed in 1976, requires the EPA to report, test, place restriction on, and keep record of chemical substances and mixtures. The EPA has authority over the use, production, importation, and disposal of specific chemicals. Some chemicals include polychlorinated biphenyls ("PCBs"), asbestos, radon, and lead paint.

State

***California Environmental Protection* Agency:** The EPA has delegated much of its regulatory authority to individual states whenever adequate state regulatory programs exist. The Department of Toxic Substance Control Division of CAL EPA is the agency empowered to enforce federal hazardous materials and waste regulations in California, in conjunction with the EPA.

California hazardous materials and waste laws incorporate federal standards, but in many respects, are stricter. For example, the California Hazardous Waste Control Law, the state equivalent of RCRA, contains a much broader definition of hazardous materials and waste. The California Code of Regulations, Titles 22 and 26, contain state hazardous materials waste laws. Regulations implementing the California Hazardous Waste Control Law list hazardous chemicals; establish criteria for identifying, packaging, and labeling hazardous wastes; prescribe management of hazardous wastes; establish permit requirements for hazardous waste treatment, storage, disposal, and transportation; and identify hazardous wastes that cannot be disposed of in landfills.

Local

Regional Water Quality Control Board: The Central Coastal RWQCB is the lead agency responsible for identifying, monitoring, and remediating leaking underground storage tanks on the Central Coast. Local jurisdictions may take the lead agency role as a Local Oversight Program ("LOP") entity, implementing State as well as local policies.

Monterey County General Plan: Relevant policies are listed below:

Policy PS-8.3 – Programs for the routine inspection of food, water systems, sewage disposal, public housing, institutions, labor camps, swimming pools, recreation facilities, locations of hazardous substances, and noise hazards shall be established or maintained.

Central Salinas County Area Plan: None of the policies provided in the CSCA are applicable to the Proposed Project.

City of Greenfield General Plan: All future development would be subject to the hazardous materials policies in the City's General Plan presented below.

Policy 8.4.1 – Identify and address hazardous waste releases from private companies or public agencies.

Policy 8.4.3 – Industrial facilities shall be constructed and operated in accordance with up-to-date safety and environmental protection standards.

Policy 8.4.4 – Industries storing and processing hazardous materials shall provide a sufficient buffer zone between the installation and the property boundaries to protect public safety, as determined by the City Building Official, with recommendations of the Fire Chief and County Health Department.

Policy 8.4.5 – New developments shall evaluate the presence or absence of naturally occurring asbestos and mitigate any impacts.

- *Program 8.5.A* Minimize impacts of new development by reviewing development proposals for potential impacts pursuant to CEQA and the Monterey Bay Unified Air Pollution Control District CEQA Guidelines. Apply land use and transportation planning techniques such as:
    - Incorporation of public transit stops;
    - Pedestrian and bicycle linkage to commercial centers, employment centers, schools, and parks;
    - Preferential parking for carpools and van pools;
    - Traffic flow improvements; and
    - Employer trip reduction programs.
- *Program 8.5.B* Control dust and particulate matter by implementing the Monterey Bay Unified Air Pollution Control District fugitive dust control measures, including:
    - Restricting outdoor storage of fine particulate matter;
    - Requiring liners for truck beds and covering of loads;
    - Controlling construction activities and emissions from unpaved areas; and
    - Paving areas used for vehicle maneuvering. In addition, the City shall address construction and operational diesel exhaust impacts in consultation with the Air District, and the need for risk assessments, when conditions warrant.

- *Program 8.5.C* Work with the Monterey Bay Unified Air Pollution Control District, the Association of Monterey Bay Area Governments ("AMBAG"), and, to the extent feasible, meet federal and State air quality standards for all pollutants. To ensure that new measures can be practically enforced in the region, participate in future amendments and updates of the Air Quality Management Plan (AQMP) for the Monterey Bay Region.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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 in 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 in an airport land use plan or, where such a plan has not been adopted, in 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?	☐	☐	☐	■

Impact Discussion

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

The Proposed Project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, or 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. The Proposed Project would entail the use of hazardous materials (e.g., fuel, cleaning materials, etc.) during construction and operation. The types and amounts of hazardous materials used would vary according to the type of activity.

Construction

The Proposed Project would result in the handling and use of hazardous materials during construction activities. Hazardous materials may include gasoline, diesel fuel, oil lubricants, welding gases, solvents, and paints. It is unlikely that construction of the Proposed Project would create a significant impact due to the routine transport, use, or disposal of hazardous materials in part due to the phased approach to the construction of the Proposed Project and the temporary nature of construction. Moreover, runoff and erosion control measures, as well as standard construction BMPs would be implemented during construction to minimize potential impacts due to contaminated runoff. To further ensure impacts related to hazardous materials is minimized, a Spill Prevention and Control Plan ("SPCP") (see **Mitigation Measure HAZ-1**) would be developed prior to construction to address any accidental spills. The SPCP would identify applicable safety and clean-up procedures in the event of a spill, designate construction staging areas where hazardous materials may be stored, identify applicable emergency notification procedures, identify locations where spill kits will be maintained during construction, and identify dedicated storage areas where material may be stored. The SPCP would be implemented in tandem with the City's existing Wastewater SPSC (see Appendix C of the PDR). The Wastewater SPCP establishes protocol for addressing a wastewater spill or facility failure and would ensure hazard generated from the release of wastewater during construction and operation is appropriately addressed.

Additionally, the final design of the Proposed Project will include methods to ensure that the accidental release of contaminants from construction (an operation where applicable) does not adversely affect the environment. Hazardous materials would be handled and stored in compliance with all local, state, and federal regulations pertaining to hazardous materials. Construction of the Proposed Project could result in the accidental release of hazardous material and could result in a significant hazard to the public. As discussed in **Section 4.3. Air Quality**, the City of Greenfield General Plan identified the Proposed Project area to be subject to naturally occurring asbestos. Implementation of construction BMPs would minimize exposure through dust suppression requirements. This impact is less than significant with mitigation.

Operation

Operation of the Proposed Project would entail the use of hazardous materials commonly associated with WWTPs (e.g., sodium hypochlorite, citric acid, oil, etc.), as well as materials used for routine maintenance and transportation. Hazardous materials would be handled and stored in compliance with all local, state, and federal regulations pertaining to hazardous materials. Furthermore, any hazardous materials would be limited in quantity and concentrations set forth by the manufacture and/or applicable regulations. While **Mitigation Measure HAZ-1** focuses on construction related impacts, the SPCP would be implemented throughout operation. Risk of release or hazard due to the routine transport, use, or disposal would be minimized through implementation of the mitigation measures identified below. The City will be responsible for implementing the Plan on-site for the duration of construction and during operation. With mitigation this represents a less than significant impact.

> **Mitigation Measure HAZ-1*:*** Prior to issuance of a grading permit, the contractor shall prepare a Hazardous Materials Spill Prevention and Control Plan that addresses potential impacts associated with hazardous material usage during construction and operation. The plan shall, at a minimum, consist of the following:

- Identify applicable safety and clean-up procedures in the event of a spill.
- Designate construction staging areas where hazardous materials may be stored. All staging areas shall be located outside of sensitive biological areas. Staging areas shall be designed to contain runoff to prevent contaminants (e.g., oil, grease, fuel products, etc.) from draining towards receiving waters and sensitive areas.
- Identify appropriate emergency notification procedures and emergency contacts (e.g., County of Monterey Environmental Health, City of Greenfield Fire, etc.).
- Designated location where a spill kit shall be maintained on-site throughout the Project.
- Identify dedicated storage areas where hazardous material may be stored and/or used during operation.

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

No schools are located in a ¼ mile of the Proposed Project site. The Proposed Project would not result in the generation of a hazardous emission in a one-quarter mile radius of a school. No impact would occur.

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?

The Proposed Project is not listed on a hazardous materials site identified pursuant to Government Code Section 6596.2. No impact would occur.

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

The Proposed Project would not result in a safety hazard or exposure to excessive noise for people residing or working in the Proposed Project area as the nearest airport is at a minimum two (2) miles southeast of the site. No impact would occur.

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

The Proposed Project would not impair implementation or physically interfere with an adopted emergency response plan or emergency evacuation plan. The Proposed Project site is not centrally located, or otherwise located near a proposed emergency evacuation route as identified in the *Monterey County 2021 Evacuation and Transportation Plan*. The primary evacuation route is Highway 101 located four (4) miles west of the Proposed Project site. Construction of the Proposed Project could result in temporary impacts to transportation along Walnut Avenue. However, the construction would be temporary – and traffic safety measures would be implemented to ensure adequate emergency access was maintained throughout the duration of construction. Moreover, operation traffic would not significantly increase beyond current levels associated with the operation of the existing WWTP. For these reasons this represents a less than significant impact.

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

The Proposed Project would not expose people or structures to a significant risk related to wildland. The Proposed Project is not located in or near a state responsibility area or lands classified as a very high fire hazard severity zone. The Proposed Project would not require the installation or maintenance of associated infrastructure that may exacerbate fire risk. For these reasons, the Proposed Project would have no impact on wildland fire.

4.10 Hydrology and Water Quality

Environmental Setting

Advanced Hydro Engineering prepared a Preliminary Floodplain Model dated May 31, 2023. The findings and recommendations of that report support the discussion and evaluation below. (see **Appendix E**).

Surface Water

The City of Greenfield is located on an alluvial plain in the Salinas Valley. Precipitation drains downward into the valley from the slopes of the Santa Lucia Mountains to the west, and the Gabilan Mountains to the east. The primary drainage feature in the valley is the Salinas River. The river is approximately 170 miles in length and is the largest river on California's Central Coast. The Salinas River flows northerly and drains into Monterey Bay (Bureau of Reclamation, 2017). The City of Greenfield draws its water supply from groundwater from the Salinas Valley Groundwater Basin. Major issues affecting the basin include chronic overdraft which has contributed to seawater intrusion near Monterey Bay and nitrate contamination due to agricultural runoff (SVBGSA, 2023)

Groundwater

The City of Greenfield is located in the Salinas Valley Forebay Subbasin. Earth Science encountered groundwater at approximately 25 feet and evaluated historical records to determine a historical high groundwater level at the Proposed Project site. The Forebay Subbasin is in the jurisdiction of the Salinas Valley Groundwater Sustainability Agency ("SVBGSA"). and the Arroyo Seco Groundwater Sustainability Agency ("ASGSA"). The Forebay Subbasin covers 94,000 acres and is bisected by the Salinas River and its main tributary, the Arroyo Seco (Forebay Aquifer Subbasin GSP, 2022). This subbasin is recharged through infiltration of surface water from streams, rivers, and deep percolation of excess applied irrigation water, deep percolation of infiltrating precipitation, and subsurface inflow from adjacent subbasins (ibid.). Groundwater elevations are generally stable throughout the Forebay Subbasin, with seasonal fluctuations (i.e., lower elevations during drought conditions). Groundwater quality in the Forebay Subbasin contains elevated nitrate concentrations, and in 2018, exceeded acceptable drinking water standards in both on-farm domestic wells and irrigation supply wells.

Although the Forebay Subbasin is located in the greater Salinas Valley Groundwater Basin which is over drafted in various regions, the Forebay Subbasin has not historically been in overdraft. The Salinas Valley Groundwater Basin consists of one large hydrologic unit comprised of four subareas: Upper Valley Subarea, Forebay Subarea, 180-Foot/400-Foot Subarea, and East Side Subarea. The subareas have different hydrogeologic and recharge characteristics, but barriers to horizontal flow do not separate them, and water can move between them. Therefore, extraction of water in the Greenfield area for agricultural and urban use could affect overdraft and seawater intrusion conditions in the overall basin, but groundwater overdraft in the Forebay Subarea has not historically been a problem (City of Greenfield, 2005).

Forebay Aquifer Subbasin Groundwater Sustainability Plan

The 2014 California Sustainable Groundwater Management Act requires that medium and high-priority groundwater basins and subbasins develop Groundwater Sustainability Plans ("GSP") that outline how groundwater sustainability will be maintained for 50 years. The Forebay Aquifer Subbasin GSP identifies potential management actions and projects that ensure the sustainable use of groundwater. Management actions and projects include but are not limited to establishing technical advisory committees, best management practices for conservation and agriculture, well registrations, water quality coordination. The Forebay Aquifer Subbasin GSP establishes management criteria that specify minimum thresholds and measurable objectives to ensure sustainability goals are met and maintained.

Flooding

The Project site is located in Zone A, in accordance with FEMA. This zone designates an area as being a special flood hazard or high-risk area prone to flooding. The project site does not contain any waterways or features. The nearest waterway to the project site is the Salinas River, located east of the site. Drainage flows from west to east, toward the Salinas River.

Regulatory Environment

Federal

National Flood Insurance Program: FEMA established the National Flood Insurance Program ("NFIP") to reduce flooding on private and public properties. The program provides subsidized flood insurance to communities that comply with FEMA regulations protecting development in floodplains. As part of the program, FEMA publishes Flood Insurance Rate Maps ("FIRM") that identify Special Flood Hazard Areas ("SFHA"). An SFHA is an area that would be inundated by the one-percent annual chance flood, which is also referred to as the base flood or 100-year flood.

Porter-Cologne Water Quality Act: The Porter-Cologne Act delegates authority to the SWRCB to establish regional water quality control boards. The Central Coast Area RWQCB has authority to use planning, permitting, and enforcement to protect beneficial uses of water resources in the project region. Under the Porter-Cologne Water Quality Control Act (California Water Code Sections 13000- 14290), the RWQCB is authorized to regulate the discharge of waste that could affect the quality of the state's waters, including projects that do not require a federal permit through the USACE. To meet RWQCB 401 Certification standards, all hydrologic issues related to a project must be addressed, including the following:

- Wetlands
- Watershed hydrograph modification
- Proposed creek or riverine related modifications
- Long-term post-construction water quality

Any construction or demolition activity that results in land disturbance equal to or greater than one acre must comply with the Construction General Permit ("CGP"), administered by the SWRCB. The CGP requires the installation and maintenance of BMPs to protect water quality until the site is stabilized. The Proposed Project would disturb more than one acre of soil and is required to obtain coverage under the RWQCB National Pollutant Discharge Elimination System ("NPDES") General Storm Water Permit.

State

Statewide Construction General Permit**:** The SWRCB has implemented a NPDES CGP for the State of California. For projects disturbing one acre or more, a Notice of Intent ("NOI") and SWPPP must be prepared by a qualified professional prior to commencement of construction. The CGP includes requirements for training, inspection, record keeping, and for projects of certain risk levels, monitoring. The general purpose of the requirements is to minimize the discharge of pollutants and to protect beneficial uses and receiving waters from the adverse effects of construction-related storm water discharges.

California Code Regulation Title 23 and Section 2924**:** Title 23 and Section 2924 define the Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems ("OWTS") adopted by the SWRCB in 2012. This regulation sets standards for OWTS at all phases of the system's lifecycle from construction to demolition. Title 23 also applies to OWTS that pool or discharge waste across the ground, and that may make groundwater or surface water undrinkable. State regional control boards are responsible for incorporating OWTS Policy standards into their water quality control plans in 12 months of the effective date of the OWTS Policy. Additionally, implementation of said policy falls under the State Water Board, regional water quality boards, and local agencies (i.e. Monterey County).

Local

Monterey County General Plan Policies**:** The 2010 Monterey County General Plan includes policies related to the conservation of water resources in the region:

Policy SC-4.1: Channelization or realignment work on the Salinas River shall not be permitted without an assessment by the Monterey County Water Resources Agency that such work will not increase the flood hazard downstream.

Policy PS-3.12 – The County shall maximize the use of recycled water as a potable water offset to manage water demands and meet regulatory requirements for wastewater discharge, by employing strategies including, but not limited to, the following:

> a. Increase the use of treated water where the quality of recycled water is maintained, meets all applicable regulatory standards, is appropriate for the intended use, and re-use will not significantly impact beneficial uses of other water resources.
> b. Work with the agricultural community to develop new uses for tertiary recycled water and increase the use of tertiary recycled water for irrigation of lands currently being irrigated by groundwater pumping.
> c. Work with urban water providers to emphasize use of tertiary recycled water for irrigation of parks, playfields, schools, golf courses, and other landscape areas to reduce potable water demand.

Policy S-2.3 – All new development, including filling, grading, and construction, in designated 100-year floodplain areas shall conform to the guidelines of FEMA and the National Flood Insurance Program and ordinances established by the County Board of Supervisors. Except for the construction of structures, Routine and Ongoing Agricultural Activities shall be exempt from this policy.

Policy S-2.6 – Drainage and flood control improvements needed to mitigate flood hazard impacts associated with potential development in the 100-year floodplain shall be determined prior to approval of new development and shall be constructed concurrently with the development.

Policy S-2.9 – New insurable buildings on existing lots of record shall be located outside the flood plain where possible.

Central Salinas County Area Plan: None of the policies provided in the CSCA are applicable to the Proposed Project.

City of Greenfield General Plan Policies: Policies applicable to the Project are presented below.

Policy 4.10.1 – Manage future development so that facilities are available for proper water supply.

Policy 4.10.2 – Support water conservation throughout the City.

Policy 4.10.4 – Water service systems shall meet regulatory standards for water delivery, water storage, and emergency water supplies.

Policy 4.10.7 – Identify, monitor, and regulate land uses and activities that could result in contamination of groundwater supplies to minimize the risk of such contamination.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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 that the project may impede sustainable groundwater management of the basin?	☐	☐	■	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
i) result in substantial erosion or siltation on- or off-site??	☐	☐	■	☐
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite?	☐	☐	■	☐

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	☐	■	☐
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?	☐	■	☐	☐

Impact Discussion

a. and e. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

The Proposed Project would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality. The Proposed Project would not violate any water quality control plans or sustainable groundwater management plans. The Proposed Project is designed to address water quality violations and would improve water quality and reliance on groundwater resources. Detailed below, the Proposed Project would comply with local and state water quality control and groundwater management plans and have a less than significant impact.

Construction

Construction of the Proposed Project would consist of substantial grading and excavation which could result in temporary water quality impacts. Additional water quality impacts could come from the use of hazardous materials (e.g., diesel fuel, gasoline, lubricants, oils, hydraulic fluids, etc.). To minimize construction generated water quality impacts the Proposed Project would implement standard construction BMPs (e.g., control/minimize grading, re-vegetate disturbed areas). Additionally, potential water quality impacts associated with accidental spills would be addressed through implementation of **Mitigation Measure HAZ-1** (spill prevention plan). Moreover, the Proposed Project would be required to comply with the requirements of the NPDES General Construction Permit to manage construction and post construction runoff. As part of this process, the Proposed Project would be required to submit a NOI with the SWRCB and prepare a SWPPP. For these reasons, the Proposed Project would have a less than significant impact with mitigation.

Operation

The Proposed Project is intended to ensure future water quality violations associated with WWTP operations are avoided. In fact, implementation of the Proposed Project would likely improve water quality by improving the process by which wastewater is treated, as discussed more thoroughly below.

Historically, operation of the City's existing WWTP has resulted in water quality violations due to certain aspects of the City's wastewater treatment system failing to operate as intended, which previously resulted in the RWQCB issuing a NOV and requiring the City to implement certain actions (e.g., evaluate the causes of system failures, develop a plan to prevent future failures, etc.) to ensure compliance with applicable water quality standards. More specifically, in 2017, the City made improvements to the existing effluent ponds to reliably allow for the treatment of two (2) mgd of wastewater. The effluent disposal site illustrated signs of overloading due to compromised percolation rates, and in 2018 overflowed and spilled into adjacent City-owned property. The RWQCB issued a NOV and required the City to develop a compliance workplan to address the issues at existing WWTP (see **Chapter 2. Project Description** for more detail). In 2020, the RWQCB adopted updated WDR, which set new effluent limitations based on the type of treatment technology. With compromised percolation rates and effluent limitations exceeding the current discharge requirements, the existing WWTP is no longer in compliance with the RWQCB's WDR.

The Proposed Project would improve overall wastewater treatment through the construction and operation of modernized facilities. The facilities would include tertiary treatment. The tertiary treatment would reduce water contaminants (e.g., nitrogen) and would comply with the WDR effluent limitations pursuant to the RWQCB's WDR Order No. R3-2020-0020. As a result, the Proposed Project would improve water quality and ensure compliance with waste discharge requirements the WDR. In addition to water quality improvements, the Proposed Project would include a recycled water component that would store and dispose of tertiary treated water as irrigation at adjacent agricultural parcels. The use of recycled water for irrigation would 1) reduce the reliance on groundwater for agriculture, and 2) allow for recharge through percolation.

The Proposed Project would also include improvements to the stormwater drainage system, including construction of improved stormwater basins, and improvements to onsite stormwater drainage (e.g., gutters). Stormwater runoff because of impervious surfaces, would be captured, collected, and stored in these improved systems (e.g., stormwater basins). Water quality effects due to on-going maintenance activities or operation of mechanized equipment would be addressed through BMPs and mitigation measures identified throughout this IS/MND (e.g., **Mitigation Measure HAZ-1**). Additionally, the Proposed Project would comply with the existing City of Greenfield Wastewater Spill Prevention Plan, which establishes protocols for addressing accidental releases or spills of wastewater (see Appendix C of the PDR). For these reasons, the Project would have a less than significant impact with mitigation.

c. *Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.*

The Proposed Project would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin. The existing WWTP does not currently meet the effluent limitations established by the RWQCB, nor does the existing WWTP have the adequate effluent disposal capacity (see **Chapter 2. Project Description**, and impact discussion 4.8(a) above). The Proposed Project would produce tertiary treated effluent that meets the effluent limitations established by the RWQCB. The Proposed Project would require up to 1,000 gallons per day of potable water use during operation. This impact would be offset both by reduced groundwater pumping from the on-site non-potable well and the use of recycled water by adjacent agricultural parcels. The use represents a minor increase in water demand that would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge. In fact, the Proposed Project would have a net beneficial impact on groundwater resources by providing an alternative source of water for irrigation purposes. As discussed previously, the Proposed Project includes the use of recycled water for irrigation purposes. The use of recycled water for agricultural irrigation would reduce reliance on groundwater resources and would thereby represent a beneficial impact. The use of recycled water for irrigation would reduce localized groundwater pumping and promote groundwater recharge through percolation. Therefore, the Proposed Project would have a net beneficial impact. For these reasons, this impact is less than significant.

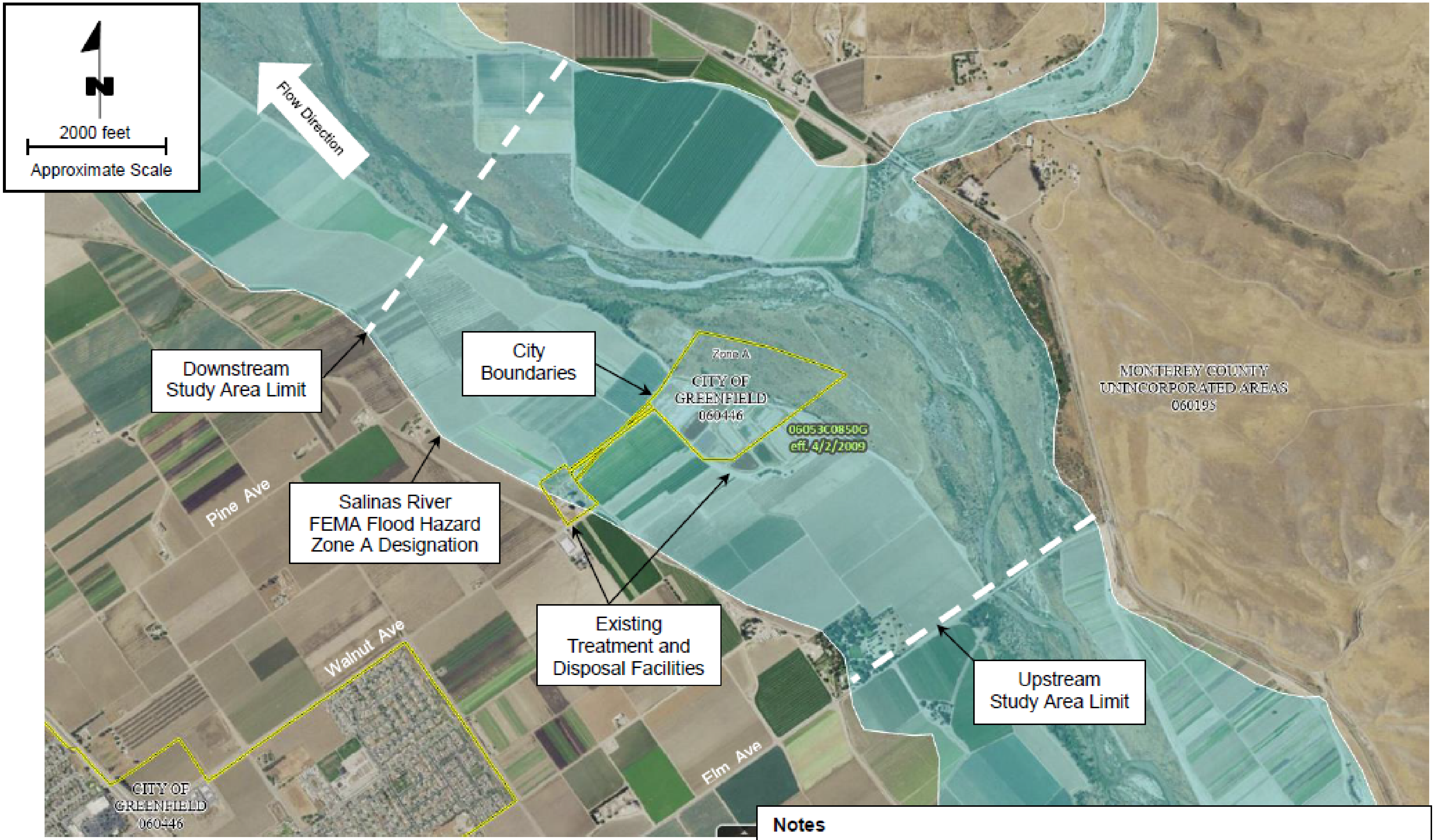
d. Result in substantial erosion or siltation on-or-off site, increase the rate or amount of surface runoff in a manner which would result in flooding on-or-off site, or create runoff which would exceed the capacity of existing or planned stormwater drainage systems or impede or redirect flood flows.

The Proposed Project would not result in substantial erosion or siltation on-or-off site, increase the rate or amount of surface runoff in a manner which would result in flooding on-or-off site, or create runoff which would exceed the capacity of exiting or planned stormwater drainage systems or impede or redirect flood flows. The Proposed Project would improve on-site stormwater drainage through the construction of a stormwater basin and on-site drainage facilities. Moreover, the implementation of standard construction BMPs to reduce erosion would ensure that impacts would be minimized to a less than significant level. Temporary increases in erosion could occur during construction due to ground-disturbing activities. See response to impact 4.8(a); see also **Section 4.6, Geology and Soils**. This impact remains less than significant.

e. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation.

The Proposed Project is not located in an area subject to significant seiche or tsunami effects. As a result, the Proposed Project would not result in the risk or release of pollutants due to inundation from a tsunami or seiche. Nor would the Proposed Project risk the release of pollutants due to the inundation in a flood hazard zone.

Portions of the existing WWTP are located in the 100-year floodplain (see **Figure 13**). Advanced Hydro Engineering prepared a hydrologic modeling report for the existing WWTP and provided recommendations for increasing the elevation to ensure the Proposed Project (more specifically the new WWTP) is outside the 100-year floodplain. Advanced Hydro Engineering conducted three (3) 100-year flood scenarios to determine the floodplain elevations. Based on the modeling, Advanced Hydro Engineering determined the floodplain elevations that would occur on the northeastern perimeter of the WWTP ranged from 220 to 225 feet. To ensure the Project is outside the 100-year floodplain, the WWTP elevations in the PDR assumed that the minimum difference in elevation between the WWTP and the 100-year water surface elevation was five feet. This resulted in the WWTP finish grade ranging from 229 feet to 244 feet (an increase of five (5) to 20 feet from existing elevations). HydroScience prepared preliminary grading plans that illustrate the grading and excavation necessary to bring the grade up (see **Figure 14**). The Proposed Project has been designed to elevate the site outside of the flood zone. Therefore, it would not be subject to potential flooding related hazards and would avoid potential impacts related to flood hazards. As such, the Proposed Project would not be located in an area subject to flooding and therefore this impact is less than significant.



Notes

1. Base Map obtained from FEMA's National Flood Hazard Layer (NFHL) Viewer. Data Refreshed December 2021.
2. The Zone A designation was developed using approximate methods. No Base (100-year) Flood Elevations (BFEs) were determined (Map No. 06053C0850G).

Source: HydroScience. June 2023. Appendix H of the Wastewater Upgrade Project Preliminary Design Report.

Flood Zone Map

Date
11/03/2023

Scale
N/A

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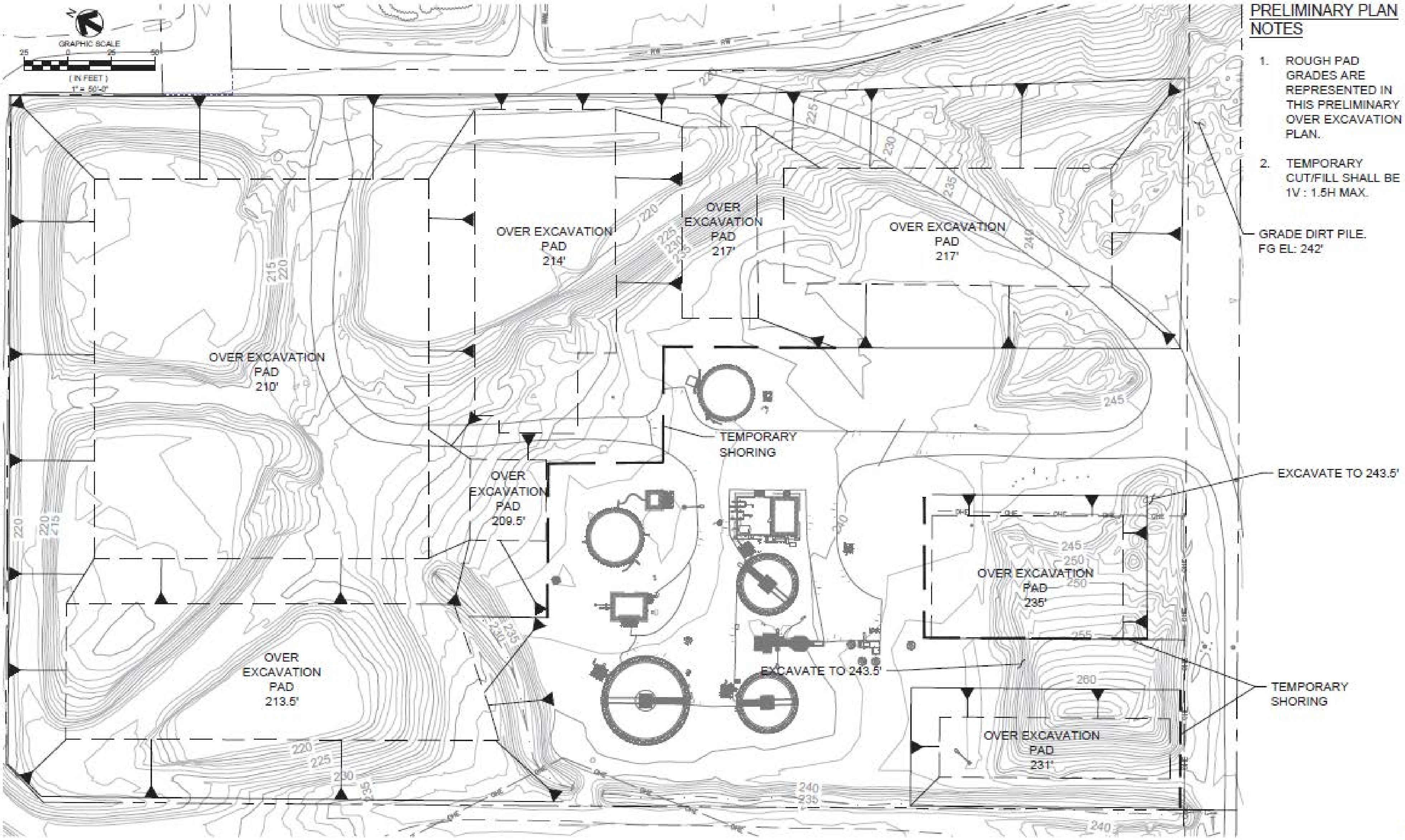
Figure
13



Source: HydroScience. June 2023. Wastewater Upgrade Project Preliminary Design Report.

Proposed Project Elevation Plan

Date
11/03/2023

Scale
N/A

Denise Duffy & Associates, Inc.
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Figure
14

4.11 Land Use and Planning

Environmental Setting

The primary physical components of the Proposed Project are located in the City of Greenfield, California in Monterey County. The use of recycled water would be located on agricultural parcels located in unincorporated Monterey County. Approximately 68.89-acres of the Proposed Project site located in the City of Greenfield is designated as "Public/Quasi Public" (County of Monterey, 2023). This land use designation provides for public and private facilities required to serve the community. Such facilities may support government, civic, cultural, health, education, or infrastructure aspects of the City of Greenfield (City of Greenfield, 2005). The site is surrounded by land designated as "Farmland" (See **Figure 3**).

Regulatory Environment

Local

Monterey County General Plan: Relevant policies are identified throughout this IS/MND.

Central Salinas County Area Plan: Policies relevant to the Proposed Project are identified throughout this IS/MND.

City of Greenfield General Plan: Policies relevant to the Proposed Project are identified throughout this IS/MND

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	☐	■	☐

Impact Discussion

a. Physically divide an established community?

The division or disruption of an established community would occur if a project created a physical barrier that separates, isolates, or divides portions of a built community. The physical division of a community is traditionally associated with the construction of large-scale transportation improvements such as a highway or the creation of a large university campus. The Proposed Project consists of the construction of new WWTP facilities, and the subsequent demolition of the existing WWTP. Additionally, the Proposed Project would install recycled water infrastructure, to store and use onsite and on adjacent agricultural parcels. The Proposed Project would improve utilities onsite and in portions of Walnut Avenue and the access road between the WWTP and effluent disposal site. The Proposed Project would not create a barrier that would divide an established community. No impact would occur.

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?*

The Proposed Project would not cause a significant environmental impact due to a conflict with any land use plan, policy, or regulations adopted for the purpose of avoiding or mitigation an environmental effect. The Proposed Project would address water quality concerns related to the RWQCB NOV, and compliance with the current RWQCB WDR. Additionally, the Proposed Project would construct recycled water infrastructure, and use it for irrigation at adjacent agricultural parcels. The production, storage, and use of recycled water would reduce the reliance of groundwater by developing a supplemental source of water supply for irrigation purposes. Furthermore, the Proposed Project would relocate critical infrastructure outside of the floodplain which would not only comply with local and state policies but would align with the development requirements of the City, County, and RWQCB.

For these reasons, the Proposed Project would have a net beneficial impact to water quality and groundwater resources. Construction of the Proposed Project would be limited to areas that are currently developed and previously disturbed in connection with existing use. Where appropriate, this IS/MND has identified mitigation measures to further ensure impacts remain less than significant. As a result, the Proposed Project would not conflict with any policies adopted for the purpose of avoiding and/or substantially lessening an adverse impact.

4.12 Noise

Environmental Setting

Noise is generally defined as sound that is loud, disagreeable, or unexpected. Sound is mechanical energy transmitted in the form of a wave because of a disturbance or vibration. Sound levels are described in terms of both amplitude and frequency. Noise is commonly defined as unwanted sound. Airborne sound is a rapid fluctuation of air pressure above and below atmospheric pressure. Sound levels are usually measured and expressed in decibels ("dB") with 0 decibels corresponding to the threshold of hearing. **Table 4.11-1 Definitions of Acoustical Terms Used** in this Report contains definitions of key technical terms. Most sounds consist of a broad band of frequencies, with each frequency differing in sound level. The intensities of each frequency add together to generate a sound.

Table 4.11-1
Definitions of Acoustical Terms Used in this Report

Term	Definitions
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micro-Pascals (or 20 micro Newtons per square meter), where 1 Pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g., 20 micro-Pascals). Sound pressure level is the quantity that is directly measured by a sound level meter.

Table 4.11-1
Definitions of Acoustical Terms Used in this Report

Term	Definitions
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and Ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period. The hourly L_{eq} used for this report is denoted as dBA $L_{eq[h]}$.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 pm to 10:00 pm and after addition of 10 decibels to sound levels in the night between 10:00 pm and 7:00 am.
Day/Night Noise Level, Ldn or DNL	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 pm and 7:00 am.
Ln Values L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

The method commonly used to quantify environmental sounds consists of evaluating all the frequencies of a sound in accordance with a weighting that reflects the facts that human hearing is less sensitive at low frequencies and extreme high frequencies than in the frequency mid-range. This is called "A" weighting, and the decibel level measured is called the A-weighted sound level (“dBA”). Although the A-weighted noise level may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a conglomeration of noise from distant sources, which creates a relatively steady background noise in which no particular source is identifiable. To describe the time-varying character of environmental noise, the statistical noise descriptors, L01, L10, L50, and L90, are commonly used. They are the A-weighted noise levels equaled or exceeded during one (1) percent, 10 percent, 50 percent, and 90 percent of a stated time period. A single number descriptor called the L_{eq} is also widely used and represents the average, or a weighted noise level during a stated period of time.

Regulatory Environment

State

The State of California regulates vehicular and freeway noise affecting classrooms, sets standards for sound transmission and occupational noise control, and identifies noise insulation standards and airport noise/land-use compatibility criteria.

California General Plan Guidelines: The State of California General Plan Guidelines, published by the Governor's Office of Planning and Research ("GOPR"), also provides guidance for the acceptability of projects in specific CNEL/Ldn contours. The guidelines also present adjustment factors that may be used to arrive at noise acceptability standards that reflect the noise control goals of the community, the community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution. For multi-family land uses, the State of California General Plan Guidelines identify a "normally acceptable" exterior noise level of up to 65 dBA CNEL/Ldn. Multi-family land uses are considered "conditionally acceptable" in noise environments of 60 to 70 dBA CNEL/Ldn, "normally unacceptable" in exterior noise environments of 70 to 75 CNEL/Ldn, and "clearly unacceptable" in exterior noise environments exceeding 75 dBA CNEL/Ldn. Assuming a minimum exterior-to-interior noise reduction of 25 dB, an exterior noise environment of 70 dBA CNEL/Ldn would allow for a normally acceptable interior noise level of 45 dBA CNEL/Ldn.

California Code of Regulations: The California Commission of Housing and Community Development officially adopted noise insulation standards in 1974. In November 1988, the Building Standards Commission approved revisions to these standards (Title 24, Part 2, California Code of Regulations). Title 24 requires interior noise levels attributable to exterior sources must not exceed 45 dB in any habitable room. Additionally, the code specifies that multi-family residential buildings or structures that will be located in exterior CNEL (or Ldn) contours of 60 dBA, or greater, of sources such as a freeway, expressway, parkway, major street, thoroughfare, airport, rail line, rapid transit line or industrial noise source shall require an acoustical analysis showing that the building has been designed to limit intruding noise to an interior CNEL (or Ldn) of 45 dBA. Predictions must also be made for future noise levels for a period of at least ten years from the time of building permit application.

Local

Monterey County General Plan: The 2010 County General Plan provides the following policy for mitigating noise impacts applicable to the Proposed Project:

Policy PS-8.3 – Programs for the routine inspection of food, water systems, sewage disposal, public housing, institutions, labor camps, swimming pools, recreation facilities, locations of hazardous substances, and noise hazards shall be established or maintained.

Central Salinas County Area Plan: None of the policies provided in the CSCA are applicable to the Proposed Project.

City of Greenfield General Plan: In the City of Greenfield, noise is dealt with on a site-specific basis and is typically limited by conditions of approval applied to new projects, which may include limitations on construction or operational hours. Additionally, noise-generating construction activities are typically limited to between the hours of 7:00 AM and 7:00 PM, Monday through Friday, and 9:00 AM and 5:00 PM Saturday and Sunday.

The Noise Element of the City of Greenfield General Plan contains policies designed to accomplish the following goals: 1) protect the community from the harmful and annoying effects of exposure to excessive noise, and 2) protect the economic base of the City by preventing the encroachment of noise-sensitive land uses into areas affected by existing noise-producing uses. The City's General Plan includes maximum allowable exterior and interior noise standards for projects affected by transportation and non-transportation noise sources. The noise compatibility of newly proposed development is determined by these standards. Noise standards for projects affected by non-transportation noise sources are summarized in **Tables 4.11-2** and **Table 4.11-3**.

Table 4.11-2
Noise Level Performance Standards for New Projects Affected by or Including Non-Transportation Noise Sources

Noise Level Descriptor	Daytime (7 AM to 10 PM)	Nighttime (10 PM to 7 AM)
Hourly L_{eq} dB	55	45

Source: City of Greenfield 2005 General Plan Noise Element

Notes:

1. Each of the noise levels specified above shall be lowered by five dB for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises (e.g., humming sounds, outdoor speaker systems). These noise level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwellings).
2. The City can impose noise level standards which are more restrictive than those specified above based upon determination of existing low ambient noise levels.
3. Fixed noise sources which are typically of concern include, but are not limited to the following: Heating, Ventilation, and Air Conditioning (“HVAC”) Systems, CoolingTowers/Evaporative Condensers, Pump Stations, Lift Stations Emergency Generators, Boilers, Steam Valves, Steam Turbines, Generators, Fans, Air Compressors, Heavy Equipment, Conveyor Systems, Transformers, Pile Drivers, Grinders, Drill Rigs, Gas or Diesel Motors, Welders, Cutting Equipment, Outdoor Speakers, Blowers. The types of uses which may typically produce the noise sources described above include but are not limited to: industrial facilities including pump stations, trucking operations, tire shops, auto maintenance shops, metal fabricating shops, shopping centers, drive-up windows, car washes, loading docks, public works projects, batch plants, bottling and canning plants, recycling centers, electric generating stations, race tracks, landfills, sand and gravel operations, and athletic fields.

Table 4.11-3
Noise Standards for New Uses Affected by Non-Transportation Noise

New Land Use	Outdoor Activity Area L_{dn}		Interior – Ldn/Peak Hour (dBA L_{dn})[1]
	Daytime	Nighttime	
All Residential[2, 3, 4]	50	45	35
Transient Lodging[5]	55		40
Hospitals & Nursing Homes[6]	50	45	35
Theatres & Auditoriums	---		35
Churches, Meeting Halls, Schools, Libraries	55		40
Office Buildings[7]	55		45
Commercial Buildings[7]	55		45
Playgrounds, Parks, etc.	65		---
Industry[7]	65	65	50

Source: City of Greenfield 2005 General Plan Noise Element

Notes:

1. Outdoor activity areas for single-family residential uses are defined as back yards. For large parcels or residences with no clearly defined outdoor activity area, the standard shall be applicable in a 100-foot radius of the residence.
2. For multi-family residential uses, the exterior noise level standard shall be applied at the common outdoor recreation area, such as at pools, play areas or tennis courts. Where such areas are not provided, the standards shall be applied to individual patios and balconies of the development.
3. Outdoor activity areas of transient lodging facilities include swimming pool and picnic areas and are not commonly used during nighttime hours.
4. Hospitals are often noise generating uses. The exterior noise level standards for hospitals are applicable only at clearly identified areas designated for outdoor relaxation by either hospital staff or patients.
5. Only the exterior spaces of these uses designated for employee or customer relaxation have any degree of sensitivity to noise.
6. The outdoor activity areas of office, commercial and park uses are not typically utilized during nighttime hours. General: The Table 5 standards shall be reduced by 5 dB for sounds consisting primarily of speech or music, and for recurring impulsive sounds. If the existing ambient noise level exceeds the standards of Table 5, then the noise level standards shall be increased at 5 dB increments to encompass the ambient.

In addition to the noise standards identified above, the City of Greenfield General Plan also includes relevant noise policies that have been adopted for the purpose of avoiding or mitigating noise and vibration impacts. Policies applicable to the Proposed Project are presented below.

Policy 9.1.1 – Noise compatibility of proposed new development shall be determined based on the land use compatibility table shown in **Table 4.11-3**, above, and the standards [contained in Tables 9-1 and 9-3] of the General Plan Noise Element for determining noise compatibility.

Policy 9.1.3 – Noise created by newly proposed non-transportation noise sources shall be mitigated so as not to exceed the noise level standards [contained in Table 9-1] in the General Plan Noise Element as measured immediately in the property line of lands designated for noise-sensitive uses.

Policy 9.1.4 – Where a proposed non-residential land use is likely to produce noise levels exceeding the performance standards [Table 9-1] in the General Plan Noise Element at existing or planned noise-sensitive uses, an acoustical analysis shall be required as part of the environmental review process so that noise mitigation may be included in the Project design. The requirements for the contents of an acoustical analysis are provided in [Table 9-2] the General Plan Noise Element).

City of Greenfield Municipal Code: The City of Greenfield Municipal Code Title 17 Noise Performance Standards states that the sound pressure level generated by any use or combination of uses on a property shall not exceed the decibel levels indicated in the **Table 4.11-4** at any property line. Chapter 17.60.030 of the Municipal Code establishes allowable hours of construction between 7:00 AM and 6:00 PM daily, except for emergency work of public service utilities.

Would the project result in:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	■	☐	☐
b) Generation of excessive ground borne vibration or ground borne noise levels?	☐	☐	■	☐
c) For a project located in the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, in 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?	☐	☐	☐	■

Impact Discussion

a. *Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?*

The Proposed Project would not generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance; or applicable standards of other agencies. The Proposed Project would, however, result in temporary construction-related noise and operational noise. While noise generated in connection with construction and operation of the Proposed Project would not constitute a substantial temporary or permanent increase in ambient noise levels, mitigation measures would be necessary to ensure that temporary construction-related impacts would be less than significant.

Construction

Construction noise typically occurs intermittently and varies depending upon the nature or phase of construction (e.g., land clearing, grading, building construction). Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. Although noise ranges were found to be similar for all construction phases, the initial site preparation phases, including grading and excavation activities, tend to involve the most equipment and result in the highest average-hourly noise levels. **Table 4.11-4** summarizes noise levels commonly associated with construction equipment. As noted in **Table 4.11-4**, instantaneous noise levels (in dBA L_{max}) generated by individual pieces of construction equipment typically range from approximately 80 dBA to 85 dBA L_{max} at 50 feet. Typical operating cycles may involve two (2) minutes of full power, followed by three (3) or four (4) minutes at lower settings. Average-hourly noise levels for individual equipment range from 73 to 82 dBA L_{eq}. Based on typical off-road equipment usage rates and assuming multiple pieces of equipment operating simultaneously in a localized area, average-hourly noise levels could reach levels of approximately 80 dBA L_{eq} at roughly 100 feet.

Table 4.11-4
Construction Equipment Noise Emission Levels

Equipment	Typical Noise Level (dBA) 50 ft from Source	Typical Noise Level (dBA) 100 ft from Source[1]	Typical Noise Level (dBA) 200 ft from Source[1]	Typical Noise Level (dBA) 400 ft from Source[1]
Air Compressor	81	75	69	63
Backhoe	80	74	68	62
Ballast Equalizer	82	76	70	64
Ballast Tamper	83	77	71	65
Compactor	82	76	70	64
Concrete Mixer	85	79	73	67
Concrete Pump	82	76	70	64
Concrete Vibrator	76	70	64	58
Dozer	85	79	73	67
Generator	81	75	69	63
Grader	85	79	73	67
Impact Wrench	85	79	73	67
Jack Hammer	88	82	76	70
Loader	85	79	73	67
Paver	89	83	77	71
Pneumatic Tool	85	79	73	67

Table 4.11-4
Construction Equipment Noise Emission Levels

Equipment	Typical Noise Level (dBA) 50 ft from Source	Typical Noise Level (dBA) 100 ft from Source[1]	Typical Noise Level (dBA) 200 ft from Source[1]	Typical Noise Level (dBA) 400 ft from Source[1]
Pump	76	70	64	58
Roller	74	68	62	56

Source: U.S. Department of Transportation, *Transit Noise and Vibration Impact Assessment,* 2006
Construction generated noise levels drop off at a rate of about 6 dBA per doubling of distance between the source and receptor.

The nearest sensitive receptors are residences located at the western edge of the Proposed Project site, at the intersection of Walnut and 2nd Street. Construction activities could occur within 25-feet of these residences and based on the noise emissions illustrated in **Table 4.11-4**, would generate a temporary but potentially significant impact. While pipeline construction could potentially impact adjacent sensitive receptors, the majority of construction related activities would occur at the existing WWTP. The nearest sensitive receptor is 700 feet south of the WWTP site. Other groups that may be impacted by construction in the rest of the Proposed Project site include agricultural workers. Based on the construction noise emission levels illustrated in **Table 4.11-4**, noise emissions diminish with distance from equipment. At 700 feet, noise emissions would likely be below the threshold established by the City of Greenfield. Conservatively, construction-generated noise levels could potentially exceed the City's noise standards. For these reasons, mitigation is necessary to ensure that temporary noise related impacts do not exceed applicable City noise standards.

> **Mitigation Measure NOS-1:** Contractor specifications shall include a requirement that construction equipment shall be equipped with noise reducing engine housings or other noise reducing technology. Nearby sensitive receptors in 100 feet of the limits of construction shall be blocked by portable acoustic barriers and/or shields to reduce noise levels such that noise levels are no more 75 dBA (or, A-Weighted Sound Level) at 25 feet. This would reduce the nighttime noise level to less than 60 dBA Leq (Equivalent Noise Level) at the nearest residence. The contractor shall submit to the City of Greenfield Public Works Director, a "Construction Noise Control Plan" for review and approval. The plan shall identify all feasible noise control procedures that would be implemented during construction activities. At a minimum, the plan shall specify the noise control treatments to achieve the specified above noise performance standard.
>
> **Mitigation Measure NOS-2:** Residences and other sensitive receptors in 250 feet of a construction area shall be notified of the construction location and schedule in writing, at least two weeks prior to the commencement of construction activities. The notice shall also be posted along Walnut where construction activities are planned and at the Project site (i.e., WWTP). The contractor shall designate a noise disturbance coordinator who shall be responsible for responding to complaints regarding construction noise. The coordinator shall determine the cause of the complaint and ensure that reasonable measures are implemented to correct the problem. A contact number for the noise disturbance coordinator shall be conspicuously placed on construction site fences and included in the notification sent to nearby residences. The City of Greenfield Public Works Director shall review and approve the construction notice prior to distribution.

Operation

The Proposed Project would not substantially increase noise levels beyond existing baseline conditions. The Proposed Project consists of the construction of new WWTP facilities, and the subsequent demolition of the existing WWTP. Additionally, the Proposed Project would construct recycled water infrastructure to allow for the use of recycled water on adjacent agricultural fields. The Proposed Project would improve utilities onsite and in portions of Walnut Avenue and the access road between the WWTP and effluent disposal site. Noise generated from operation of the Proposed Project would be consistent with the noise generated from the existing WWTP. No new noise would be generated by the Proposed Project operation. This impact is less than significant.

b. Generation of excessive ground borne vibration or ground borne noise levels?

Construction of the Proposed Project would generate temporary groundborne vibration. A vibration impact could occur where noise-sensitive land uses are exposed to excessive vibration levels. The nearest sensitive receptors are located approximately 25 feet from pipeline installation and 700 feet from the limits of construction associated with the new WWTP. People residing in these areas, specifically near the proposed pipeline along Walnut Avenue, could be exposed to temporary groundborne vibration or groundborne noise levels. Vibratory compactors or rollers and pavement breakers can generate perceptible vibration. Heavy trucks can also generate groundborne vibration, which varies depending on vehicle type, weight, and pavement conditions. The Federal Transit Authority has published standard vibration levels and peak particle velocities for construction equipment. **Table 4.11-5** below summarizes these standards for construction equipment.

Table 4.11-5
Vibration Velocities for Construction Equipment

Equipment	Approximate Velocity Level at 25 Feet ("VdB")	Approximate Peak Particle Velocity at 25 Feet ("inches/second")	Approximate Peak Particle Velocity at 50 feet ("inches/second")	Approximate Peak Particle Velocity at 400 feet ("inches/second")
Pile Driving (sonic)	104	0.644	N/A[1]	0.006
Pile Driver (impact)	112	1.518	N/A[1]	0.015
Large Bulldozers	87	0.089	0.031	0.001
Small Bulldozer	58	0.003	0.001	0.000
Loaded Trucks	86	0.076	0.027	0.001
Jackhammer	79	0.035	N/A[1]	0.000

Note: Data reflects typical vibration level. Source: (U.S. Department of Transportation, May 2006)

For purposes of this analysis, excessive groundborne vibration would be 0.2 inches per second (as derived from the U.S. Department of Transportation, Earthborne Vibrations Technical Advisory equation for attenuation of vibration) which is the level at which vibration could cause damage to masonry and wood buildings. Vibration levels from construction equipment attenuate as they radiate from the source. (U.S. Department of Transportation, May 2006). Sensitive receptors in the area could be exposed to groundborne vibrations of varying magnitudes depending on the type of equipment and proximity to construction activities, as shown in **Table 4.11-5**. Ground disturbing activities associated with project grading and excavation could involve the operation of large and small bulldozers and loaded trucks. These activities could impact sensitive receptors in the area. The vibration level associated with these types of equipment would attenuate to a maximum of approximately 0.003 inches per second at 25 feet, which would be barely perceptible and would be well under the threshold of 0.2 inches per second. Moreover, the nearest sensitive receptors are residences located at the western edge of the Proposed Project site, at the intersection of Walnut and 2nd Street. Construction activities could occur in 25-feet of these residences. Construction near these residences would be required for installation of pipelines in the road right-of-way and would be temporary in nature. More extensive construction activities would occur at the existing WWTP site. The nearest sensitive receptor is 700 feet south of the WWTP site. Vibration associated with the construction of the Proposed Project would be below levels that could cause damage to structures, would not result in prolonged interference for sensitive receptors, and would barely be perceptible. For these reasons, this impact is less than significant.

c. *For a project located in the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, in two miles of a public airport or public use airport, would the project expose people be residing or working in the project area to excessive noise levels?*

The Proposed Project is not located in the vicinity of a private airstrip or an airport land use plan. No impact would occur.

4.13 Population and Housing

Environmental Setting

The Proposed Project is located in southern Monterey County, with the majority of the Project boundary being located in the City of Greenfield. The City of Greenfield is located 35 miles south of the City of Salinas. The City of Greenfield is eight (8) miles north of the City of Soledad and 17 miles north of the City of Gonzales. King City is located 11 miles south. The Project site is in the vicinity of Highway 101 off Walnut Avenue. The City of Greenfield has a population of 18,937 (U.S. Census, 2020), with an estimated 4,207 housing units. The average household size is 4.35 persons per housing unit. Based on current conditions and trends, AMBAG estimates that growth in the City of Greenfield is projected to increase by 19 percent between 2015 and 2045 (AMBAG, 2022). Similarly, the number of housing units needed to support the increase in population is expected to increase by 38 percent between 2015 and 2045.

The Proposed Project would improve the performance of the existing WWTP to ensure the facility can accommodate future flows and comply with current water quality standards.

Regulatory Setting

Local

Monterey County General Plan: The 2010 Monterey County General Plan includes a Housing Element that identifies policies to address population and housing.

Policy H-2.13 – Assist in infrastructure and public facility improvements that support existing and new affordable housing.

Central Salinas County Area Plan: None of the policies provided in the CSCA are applicable to the Proposed Project.

City of Greenfield General Plan: Policies in the City's General Plan have been adopted for the purpose of avoiding or mitigating population and housing impacts from development projects. Policies applicable to the Proposed Project are presented below:

Policy 4.11.1 – Coordinate future development with the capacity of the Greenfield Wastewater Treatment Plant to ensure facilities are available for proper wastewater disposal.

Policy 4.11.4 – Plan and secure permits for expanded wastewater treatment before the need is immediate.

- Program 4.11.C – At the project approval stage, new development shall demonstrate that wastewater treatment capacity can be provided. The City shall obtain assurance that 1) capacity exists in the wastewater treatment system if a development project is built in a set period of time, or 2) capacity will be provided by a funded program or other mechanism. This finding will be based on information furnished or made available to the City from consultations with the Greenfield Wastewater Treatment Plant, the applicant, or other resources.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Induce substantial unplanned population growth in the 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?	☐	☐	☐	■

Impact Discussion

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

The Proposed Project would not directly induce substantial unplanned population growth in the area either. As discussed in **Chapter 2. Project Description**, the Proposed Project would improve the performance of the existing WWTP to ensure the facility can accommodate future flows and comply with current water quality standards. Improvements to the WWTP facilities were identified as necessary to accommodate planned population growth as discussed in the most current City of Greenfield Housing Element. Therefore, the Proposed Project would not induce (directly or indirectly) unplanned population growth. Moreover, the Proposed Project would not exceed the permitted treatment capacity of the existing WWTP. The Proposed Project could however result in indirect population growth by removing a barrier to development (i.e., WWTP capacity). These indirect impacts would not be significant as the WWTP would not facilitate additional growth beyond levels anticipated in the City's General Plan. Recycled water would be used for agricultural purposes and therefore would not result in a new source of water that could induce population growth (e.g., housing). For these reasons, the Proposed Project would have a less than significant impact.

b. *Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere.*

The Proposed Project would not displace substantial numbers of existing people or housing; necessitating the construction of replacement housing elsewhere. No impact would occur.

4.14 Transportation

Environmental Setting

Regional access to the Proposed Project site is via Highway 101. Local access is via Walnut Avenue. Highway 101 is a major north-south roadway running across California. Regionally, Highway 101 connects Monterey County with San Luis Obispo County to the south and San Benito County and the San Francisco Bay Area to the north. Near the Proposed Project site, Highway 101 is a four-lane freeway, two (2) lanes northbound, and two (2) lanes southbound. Highway 101 is not a designated scenic highway.

Local access to the project site is provided by Walnut Avenue and Espinosa Road in the City of Greenfield. Walnut Avenue runs east to west and is a four (4) lane City road from the 101 interchange east to the intersection of 3rd Street, and two (2) lanes continuing east towards 2nd Street. From the 2nd Street intersection, Walnut Avenue turns to a two (2) lane street before becoming a dirt road. At the terminus of Walnut Avenue, access to the Project site is provided by Espinosa Road. The City of Greenfield General Plan identifies Walnut Avenue as an *Arterial Street,* which accommodates high traffic volumes and provides the major circulation between activity centers, freeways, and other arterials. Walnut Avenue has been identified as a truck route in the City of Greenfield General Plan.

The City of Greenfield’s General Plan qualitatively evaluated existing traffic conditions. Level of Service (“LOS”) is a qualitative assessment of motorist and passenger perceptions of traffic conditions. LOS generally reflects traveling conditions such as travel time and speed and freedom to maneuver, traffic interruptions, and volume to capacity ratios to approximate driver satisfaction. The LOS measures differ by roadway type and are designated as LOS A to LOS F. LOS A represents free-flow conditions, while LOS F indicates excessive delays and congestion. As of 2005, the LOS at Walnut Avenue traveling east from Highway 101 had an existing designation of LOS A and an average daily traffic (“ADT”) of 5700 vehicles (City of Greenfield, 2005).

Regulatory Environment

State

Senate Bill 743: SB 743 required that starting July 2020 transportation impact for projects per CEQA be based on a project’s Vehicle Miles Traveled (“VMT”). CEQA Guidelines Section 15064.3, subdivision (b)(1) calls for the evaluation of transportation impacts of projects based on VMT. CEQA uses the VMT metric to evaluate a project’s transportation impacts. The publication *Technical Advisory on Evaluating Transportation Impacts in CEQA, State of California Governor’s Office of Planning and Research*, December 2018, suggests that a significant environmental impact would occur if a project would generate more than 110 trips per day.

Local

Monterey County General Plan**:** The 2010 Monterey County General Plan includes policies related to transportation and circulation. Relevant policies are listed below.

Policy C-2.7 – New development shall be located and designed with convenient access and efficient transportation for all intended users and, where possible, consider alternative transportation modes.

Central Salinas County Area Plan**:** None of the policies provided in the CSCA are applicable to the Proposed Project.

City of Greenfield General Plan**:** Policies in the City's General Plan have been adopted for the purpose of avoiding or mitigating circulation impacts from development projects. Policies applicable to the Proposed Project are presented below:

Policy 3.1.3 – During project planning and design, developments shall recognize streets as multi-modal transportation corridors and as an interactive community space.

Policy 3.7.2 – Integrate land use development and transportation planning in project design.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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 intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	■
d) Result in inadequate emergency access?	☐	☐	☐	■

Impact Discussion

a .and b. Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities? Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

The Proposed Project would not conflict with a program plan, ordinance, or policy addressing the circulation system, including transit, roadways, and bicycle and pedestrian facilities, or be inconsistent with CEQA guidelines Section 15064.3(b). The Proposed Project would result in temporary construction related traffic and a nominal increase in operational traffic. CEQA Guidelines Section 15064.2 subdivision (b)(1) calls for the evaluation of transportation impacts of projects based on VMT. CEQA uses the VMT metric to evaluate a project's transportation impacts. In the absence of City and County VMT standard metrics, this IS/MND relies on the Office of Planning and Research's recommended small project screening threshold to determine whether the Proposed Projects VMT effects would be significant. For the IS/MND the Proposed Project would result in a significant traffic-related effect if the Proposed Project would exceed 110 daily trips.

Construction

The Proposed Project would result in temporary construction-related traffic. Construction would require 10 – 50 workers onsite at any given time during the duration of construction. Most of the equipment would be brought to the site at the beginning of work and remain until the completion of construction. As necessary, trucks would bring materials such as water pipes, gravel, and asphalt for the road, etc. to the site. These deliveries would take place over the course of construction of the Proposed Project. Construction of the Proposed Project would be phased over the course of two years, and construction would primarily occur between the hours of 7 AM – 7 PM, Monday through Saturday. No construction would occur on Sundays or holidays. Based on the construction schedule, and the temporary nature of construction, it is unlikely that construction traffic would exceed the threshold of 110 daily trips. Due to the temporary nature of construction, and phased approach, this impact would be less than significant.

Operation

The Proposed Project would generate additional traffic trips during operation. These trips would occur in connection with periodic deliveries of material and maintenance related activities, as well as routine daily traffic trips associated with on-site operational employees. The Proposed Project would result in approximately 12 to 16 daily traffic trips. Anticipated operational traffic trips would be below the threshold of 110 daily trips. Moreover, anticipated traffic associated with operation of the Proposed Project would not substantially increase traffic beyond existing levels associated with the operation of the existing WWTP. For these reasons, this represents a less than significant impact.

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

The Proposed Project would not substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersection) or incompatible uses. Construction and operation of the Proposed Project would improve the existing access and internal circulation of the site. Improvements along Walnut Avenue and the access road between the WWTP and the effluent disposal site would include new pavement and curbs. No impact would occur.

d. *Result in inadequate emergency access?*

The Proposed Project would not result in inadequate emergency access. The Project would not affect existing access to the WWTP. No impact would occur.

4.15 Tribal Cultural Resources

Albion Environmental , Inc. ("Albion") prepared a Phase I Cultural Resource Inventory for the Proposed Project in March 2024. The Phase 1 Cultural Resource Inventory includes the results of background research and field reconnaissance of the Proposed Project's Area of Potential Effect ("APE") (See **Figure 9**). Background research consisted of a records search from the Northwest Information Center at Sonoma

State University ("NWIC"), a Sacred Lands File search with the Native American Heritage Commission ("NAHC"), and Native American consultation in support of consultation under NHPA Section 106 and AB 52. The field reconnaissance consisted of a pedestrian survey of the APE on November 15, 2023, which investigated three (3) survey areas within the APE for cultural and Tribal cultural resources.

Environmental Setting

Regional History

Prior to Euro-American contact, the area now known as Monterey County was inhabited by native speakers of the Costanoan, Esselen, and Salinan languages. The traditional way of life for the native inhabitants was largely destroyed in the 1760s with the arrival of Euro-Americans.

The Ohlone inhabited a large range along the coast of California that extended from the San Francisco Peninsula south to the Monterey Peninsula and included inland areas from the Santa Clara Valley through San Juan Batista. The Ohlone speak a Costanoan language whereas their southern neighbors, the Esselen and Salinan speak Hokan languages of Esselen and Salinan, respectfully (Albion, 2024). At the time of early contact with European explorers, Ohlone villages were encountered approximately every three to five miles. The Esselen inhabited areas now known as the Big Sur mountains, upper Carmel Valley, the upper Arroyo Seco watershed, and areas in the western edge of the Salinas Valley to Greenfield (Albion, 2024).

While first contact between Indigenous communities and Europeans took place in 1542, followed half a century later in 1602, European settlement began in the 1760's when the Spanish decided to establish colonies in what they identified as Alta California (Albion, 2024). The establishment of Misión San Carlos de Borromeo de Carmelo marked the beginning of a period of intense Native American conversion to Catholicism. After Mexico gained its independence from Spain in 1820, the government granted most land around Monterey to wealthy Mexican families as large tracts of lands known as ranchos. The area of Salinas Valley consisted primarily of grazing lands, and the main ranchos that made up the region were Rancho Nacional and Rancho Sausal (Albion, 2024). During this time, the remaining Native American groups were employed as ranch hands and domestic servants. Following the 1846 capture of California by the United States, industry in the Salinas valley shifted away from grazing lands and towards agriculture. As the competition for land increased with the arrival of Anglo settlers, Native American communities continued to disappear.

Native American Consultation

The City of Greenfield, and Albion on behalf of the City, sent letters containing a brief project description and maps of the APE to the following groups identified by the NAHC in December 2023: the Amah Mutsun Tribal Band, Costanoan Rumsen Carmel Tribe, Amah Mutsun Tribal Band of Mission San Juan Bautista, Ohlone/Costanoan-Esselen Nation, Salinan Tribe of Monterey and San Luis Obispo Counties, Esselen Tribe of Monterey County, Indian Canyon Mutsun Band of Costanoan, Rumsen Am:a Tur:ataj Ohlone, Wuksache Indian Tribe/Eshom Valley Band, and Xolon-Salinan Tribe. Request for consultation were received from the Esselen Tribe of Monterey County, Salinan Tribe of Monterey, Ohlone/Costoanoan-Esselen Nation, and Indian Canyon Band of Costanoan Ohlone People for consultation in January 2024.

Both the Esselen Tribe of Monterey County and the Indian Canyon Band of Costanoan Ohlone People requested that preconstruction training and tribal monitoring for both on-site and off-site ground disturbance be included in the Proposed Project. And, requested that cultural sensitivity training be provided at the start of construction. The Xolon-Salinan Tribe requested additional information about the Project which included a copy of the final archaeological report and project coordinates.

Albion sent follow up emails to all contacted Tribes on January 18, 2024, and again on March 8, 2024 to coordinate in-person (or virtual) consultation meetings as requested. No responses were received. At the request of the City, consultation pursuant to Section 106 and AB 52 concluded on March 13, 2024.

Regulatory Environment

Federal

National Historic Preservation Act. Section 106 of the National Historic Preservation Act of 1966 (54 U.S.C. § 300301 et seq.), as amended, requires that a federal agency with direct or indirect jurisdiction over a proposed federal or federally assisted undertaking, or issuing licenses or permits, consider the effect of the proposed undertaking on historic properties. A historic property may include a prehistoric or historic-era building, structure, object, site or district included in, or eligible for inclusion in, the National Register maintained by the U.S. Secretary of the Interior. Federal agencies must also allow the ACHP to comment on the proposed undertaking and its potential effects on historic properties. The implementing regulations for Section 106 of the NHPA (36 CFR 800) require consultation with the SHPO, the ACHP, federally recognized Indian tribes and other Native Americans, and interested members of the public throughout the compliance process. The four principal steps are:

- Initiate the Section 106 process, including consultation with interested parties (36 CFR 800.3);
- Identify historic properties, i.e., resources included in or eligible for inclusion in the National Register (36 CFR 800.4);
- Assess the effects of the undertaking on historic properties within the area of potential effect (36 CFR 800.5); and
- Resolve adverse effects (36 CFR 800.6).

Adverse effects on historic properties are often resolved through preparation of a Memorandum of Agreement or Programmatic Agreement developed in consultation between the federal agency, the SHPO, Indian tribes, and interested members of the public. The ACHP is also invited to participate. The agreement describes stipulations to mitigate adverse effects on historic properties listed in or eligible for the National Register (36 CFR 60).

National Register of Historic Places. The National Historic Preservation Act established the National Register as "an authoritative guide to be used by federal, state, and local governments, private groups and citizens to identify the Nation's historic resources and to indicate what properties should be considered for protection from destruction or impairment" (36 CFR Section 60.2). The National Register recognizes both historic-era and prehistoric archaeological properties that are significant at the national, state, and local levels.

To be eligible for listing in the National Register, a resource must be significant in American history, architecture, archaeology, engineering, or culture. Buildings, structures, objects, sites or districts of potential significance must meet one or more of the following four established criteria (NPS, 1990):

A. Are associated with events that have made a significant contribution to the broad patterns of our history;

B. Are associated with the lives of persons significant in our past;
C. 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. Have yielded, or may be likely to yield, information important in prehistory or history.

Unless the property possesses exceptional significance, it must be at least 50 years old to be eligible for National Register listing (NPS, 1990). In addition to meeting the criteria of significance, a property must have integrity. Integrity is defined as “the ability of a property to convey its significance” (NPS, 1990). The National Register recognizes seven qualities that, in various combinations, define integrity. To retain historic integrity a property must possess several, and usually most, of these seven aspects. Thus, the retention of the specific aspects of integrity is paramount for a property to convey its significance. The seven factors that define integrity are location, design, setting, materials, workmanship, feeling, and association.

Although the National Register standards for historic integrity are high, the National Register accepts that a property “must also be judged with reference to the particular criteria under which a resource is proposed for eligibility.” Most archaeological properties are evaluated under Criterion D; the most applicable qualities of integrity under this criterion are those of location, materials, and association.

Integrity also defines the research potential of a resource. To possess research potential, archaeological data must have integrity in the form of what has been called “focus” (Deetz, 1977). Focus, in this context, means the accuracy with which the archaeological remains represent a situation or condition. When focus is absent or inadequate because of disturbance, a resource does not retain integrity. Remains that represent several activities or have materials that cannot be separated from one another into discrete contexts may also lack focus and therefore integrity.

State

CEQA and California Register of Historical Resources: CEQA requires regulatory compliance for projects involving historic resources throughout the State. Under CEQA, public agencies must consider the effects of their actions on historic resources (Public Resources Code, Section 21084.1). The CEQA Guidelines define a significant resource as any resource listed in or determined to be eligible for listing in the California Register of Historical Resources (California Register) [see Public Resources Code, Section 21084.1 and CEQA Guidelines Section 15064.5 (a) and (b)].

The California Register of Historical Resources was created to identify resources deemed worthy of preservation and was modeled closely after the National Register of Historic Places. The criteria are nearly identical to those of the National Register, which includes resources of local, state, and regional and/or national levels of significance. Under California Code of Regulation Section 4852(b) and Public Resources Code Section 5024.1, a historical resource must be greater than 50 years old and must be significant at the local, state, or national level under one or more of the following four criteria:

1. It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States.
2. It is associated with the lives of persons important to local, California, or national history.

3. It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or important creative individual or possesses high artistic values.
4. It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

Properties of local significance that have been designated under a local preservation ordinance (local landmarks register or landmark districts) or that have been identified in a local historical resources inventory may be eligible for listing in the California Register and are presumed to be historical resources for the purposes of CEQA unless a preponderance of evidence indicates otherwise (Public Resources Code, Section 5024.1g; California Code of Regulations, Title 14, Section 4850).

California Code of Regulations Section 4852(c) addresses the issue of "integrity," which is necessary for eligibility for the California Register. Integrity is defined as "the authenticity of an historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance." Section 4852(c) provides that historical resources eligible for listing in the California Register must meet one of the criteria for significance defined by 4852(b) (1 through 4) and retain enough of their historic character of appearance to be recognizable as historical resources and to convey the reasons for their significance.

California Public Resources Code: Several sections of the California PRC protect cultural resources located on public land. Under PRC Section 5097.5, no person shall knowingly and willfully excavate upon, or remove, destroy, injure, or deface, any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site (including fossilized footprints), inscriptions made by human agency, rock art, or any other archaeological, paleontological, or historical feature situated on public lands, except with the express permission of the public agency that has jurisdiction over the lands. Violation of this section is a misdemeanor.

PRC Section 5097.98 states that if Native American human remains are identified within a project area, the landowner must work with the Native American Most Likely Descendant as identified by the NAHC to develop a plan for the treatment or disposition of the human remains and any items associated with Native American burials with appropriate dignity. Section 15064.5 of the State CEQA Guidelines also addresses these procedures. California Health and Safety Code Section 7050.5 prohibits disinterring, disturbing, or removing human remains from a location other than a dedicated cemetery. Section 30244 of the PRC requires reasonable mitigation for impacts on paleontological and archaeological resources that occur because of development on public lands.

California Health and Safety Code: California Health and Safety Code Section 7050.5 regulates the treatment of human remains. In the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site, or any nearby area reasonably suspected to overlie adjacent remains until the coroner of the county in which the human remains are discovered has determined that the remains are not subject to his or her authority. If the coroner recognizes the human remains to be those of a Native American or has reason to believe that they are those of a Native American, he or she shall contact the NAHC by telephone within 24 hours.

Native American Heritage Commission**:** The NAHC was created by statute in 1976, is a nine-member body appointed by the Governor to identify and catalog cultural resources (i.e., places of special religious or social significance to Native Americans and known graves and cemeteries of Native Americans on private lands) in California. The Commission is responsible for preserving and ensuring accessibility of sacred sites and burials, the disposition of Native American human remains and burial items, maintaining an inventory of Native American sacred sites located on public lands, and reviewing current administrative and statutory protections related to these sacred sites.

State Assembly Bill 52: Prior to the enactment of Assembly Bill 52, the State of California found current laws provided limited protection for sites, features, places, objects, and landscapes with cultural value to California Native American Tribes. These items and locations included the protection of Native American sacred places such as places of worship, religious or ceremonial sites, and sacred shrines. California Native Americans have used, and continue to use, natural settings in the conduct of religious observances, ceremonies, and cultural practices and beliefs. These resources reflect the Tribes' continuing cultural ties to the land and their traditional heritage. Many of these archaeological, historical, cultural, and sacred sites are not located in the current boundaries of California Native American reservations and rancherias, and therefore are not covered by the protectionist policies of Tribal governments. To recognize California Native American Tribal sovereignty and the unique relationship of California local governments and public agencies with California Native American Tribal governments, and respecting the interests and roles of project proponents, the Legislature enacted AB 52 Native Americans: California Environmental Quality Act.

Enactment of AB 52 formally recognizes that California Native American prehistoric, historic, archaeological, cultural, and sacred places are essential elements in Tribal cultural traditions, heritages, and identities. California Native American Tribes are experts regarding their Tribal history and practices for which they are traditionally and culturally affiliated. Due to this unique history, and to uphold existing rights of all California Native American Tribes to participate in, and contribute their knowledge to, environmental analysis, projects should include Tribal knowledge about the land and Tribal cultural resources at issue. Projects should also consider a potential significant impact on those resources. Therefore, a meaningful consultation between California Native American Tribal governments and lead agencies, respecting the interests and roles of all California Native American Tribes and project proponents, and the level of required confidentiality concerning Tribal cultural resources shall occur. Doing so will allow identification of potential Tribal cultural resources onsite and incorporation of culturally appropriate mitigation measures considered by the decision-making body of the lead agency. Doing so also enables California Native American Tribes to manage and accept conveyances of, and act as caretakers of, Tribal cultural resources and ultimately establishes that a substantial adverse change to a Tribal cultural resource has a significant effect on the environment.

Local

Monterey County General Plan**:** The 2010 Monterey County General Plan includes policies related to the preservation of cultural resources, please see **Section 4.5, Cultural Resources**.

Central Salinas County Area Plan**:** None of the policies provided in the CSCA are applicable to the Proposed Project.

City of Greenfield General **Plan:** Policies in the City of Greenfield General Plan have been adopted for the purpose of avoiding or mitigating land use impacts from development projects. Policies applicable to the Project are presented below.

Policy 7.6.1 - Preserve areas that have been identifiable and of important archaeological or paleontological significance.

- Program 7.6.A - Adopt the following conditions on all discretionary projects regarding the discovery of archaeological or paleontological resources:
  i. The Planning Department shall be notified immediately if any prehistoric, archaeological, or paleontology artifact is uncovered during construction. All construction must stop and an archaeologist that meets the Secretary of the Interior's Professional Qualifications Standards in prehistoric or historical archaeology shall be retained to evaluate the finds and recommend appropriate action.

  All construction must stop, and the authorities notified if any human remains are uncovered. The County Coroner must be notified according to Section 7050.5 of the California's Health and Safety Code. If the remains are determined to be Native American, the procedures outlined in CEQA Section 15064.5 (d) and (e) shall be followed.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k), or	☐	■	☐	☐
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set fourth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set fourth 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.	☐	■	☐	☐

Impact Discussion

a.i. and a.ii, Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is: 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 A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public

Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

The Cultural Resource Inventory included archival research, a background records search at NWIC, a Sacred Lands File search with the NAHC, a visual survey of the Proposed Project site, a review of the site's geology and soil profiles. AB 52 and Section 106 consultation with Native American Tribes was also completed. The Proposed Project site is not located on a Sacred Lands site, and background research and the survey of the Proposed Project site yielded negative results for Tribal cultural resources. The NWIC records search identified one (1) archeological study within the Proposed Project site and two (2) within a 1/2-mile radius of the Proposed Project site. Visual surveys did not find evidence of any potential Tribal cultural resources. Furthermore, the review of the sites geology and soil suggested that overall, the area would not likely contain resources, as the Proposed Project site is extensively disturbed in connection with the development of existing WWTP facilities, and on-going disturbance associated with agricultural use of the areas proposed for future recycled water use.

The Proposed Project site contains one (1) area with relatively stable floodplain deposits and would be considered sensitive for buried cultural resources. However, the Proposed Project would not subject this area to ground disturbing activities. Therefore, Albion concluded that the Proposed Project would not cause a substantial adverse change in the significance of a Tribal cultural resource. However, Tribal cultural resources may not leave archaeological footprints or be physically identifiable. During Section 106 consultation, the Esselen Tribe of Monterey County requested preconstruction training for construction workers and presence of a Tribal monitor prior to and during ground disturbing construction activities. In accordance with this request, the City will implement **Mitigation Measure CUL-1** and **CUL-2**, as discussed in **Section 4.5 Cultural Resources**. Additionally, the Proposed Project would implement **Mitigation Measure TR-1**. Implementation of these mitigation measures would ensure the Project has a less than significant impact on Tribal cultural resources.

> **Mitigation Measure TR-1:** Prior to ground disturbance activities, a Tribal Cultural monitor shall provide cultural sensitivity training to all construction personnel. The training shall explain applicable statues, regulations, enforcement provisions; the prehistoric and historic environmental setting and context, local tribal groups; show sample artifacts; and what prehistoric and historic archaeological deposits look like at the surface and when exposed during construction. Construction personnel shall not be permitted to operate equipment within the construction area unless they have attended the training. A list of the names of all personnel who attended the training, and copies of the signed acknowledgement forms shall be submitted to the City of Greenfield Director of Public Works or a designee.

4.16 Utilities and Service Systems

Environmental Setting

Water Supply

The City of Greenfield is located in the Salinas Valley Groundwater Basin – Forebay Aquifer. The City of Greenfield owns and operates a water distribution system that is comprised of one (1) distribution/pressure zone, two (2) potable water storage tanks, and two (2) pump stations (City of Greenfield, 2021). The water distribution system is comprised of 36 miles of water mains that span over

2.1 square miles and serves approximately 3,800 customers (Ibid.) The existing WWTP does not currently have a potable water supply source. All water used at the existing WWTP is provided by an on-site non-potable groundwater well. The Proposed Project would abandon the existing on-site well and connect to existing potable water distribution pipeline in Walnut Avenue.

Wastewater

The existing WWTP consists of approximately 21 miles of collection system pipelines with diameters ranging from four (4) to 24 inches and six (6) sewer lift stations. The existing WWTP consists of a headworks, an aerobic digester for primary sludge treatment, sludge drying beds for drying of digested sludge, three (3) primary clarifiers for primary treatment, three (3) aerated ponds for secondary treatment, and rapid infiltration basins for effluent disposal (City of Greenfield and Carollo Engineers, 2021). **Figure 4** illustrates the existing facilities. Other facilities associated with the WWTP include an onsite non-potable well and two (2) stormwater basins. Three (3) employees operate the existing facility. The PDR provides a detailed description of existing facilities.

The Proposed Project would consist of the construction of a new WWTP and the subsequent demolition of the existing WWTP, construction of recycled water infrastructure and use of recycled water on adjacent agricultural parcels. The Project would be located substantially in the footprint of the existing WWTP and effluent treatment site, and in the right-of-way of Walnut Avenue, areas that are currently disturbed and developed.

Solid Waste

Tri-Cities Disposal and Recycled Service provides solid waste and recycling collection services for the City of Greenfield. Solid waste and recycling are disposed of at the Johnson Canyon Landfill in Gonzales, California. The Johnson Canyon Landfill has a maximum permitted capacity of 18,500,000 cubic yards, a 1,694 Tons per Day capacity, and is estimated to have disposal capacity through year 2066 (CalRecycle, 2023).[10]

Regulatory Environment

State

Assembly Bill 939: California AB 939 established the California Integrated Waste Management Board (CalRecycle), which required all California counties to prepare Integrated Waste Management Plans. Additionally, AB 939 required all municipalities to divert 50 percent of their waste stream by the year 2000.

California Green Building Standards Code: In 2022, California adopted the most recent version of the California Green Building Standards Code, which establishes mandatory green building standards for new and remodeled structures in California. These standards include a mandatory set of guidelines and more

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[10] In December 2021, the Salinas Valley Solid Waste Authority submitted a Revised Solid Waste Facilities Permit that would increase the permitted maximum tonnage, with a phased increase beginning in 2026. The revised permit would similarly increase the daily disposal capacity and extend the closure date from 2055 to 2066. https://www2.calrecycle.ca.gov/PublicNotices/Details/4558#:~:text=Increase%20in%20the%20disposal%20Design%20Capacity%20from%2013%2C834%2C328,Capacity%20from%2026%2C000%20tons%20to%2057%2C276%20cubic%20yards.

stringent voluntary measures for new construction projects, to achieve specific green building performance levels as follows:

- Reduce indoor water use by 20 percent;
- Reduce wastewater by 20 percent;
- Recycle and/or salvage 50 percent of nonhazardous construction and demolition debris; and
- Provide readily accessible areas for recycling by occupant.

Local

Monterey County General Plan**:** The 2010 Monterey County General Plan contains policies concerning utilities and services applicable to the Proposed Project:

Policy PS-5.3 – Programs to facilitate recycling/diversion of waste materials at new construction sites, demolition projects, and remodeling projects shall be implemented.

Policy PS-5.4 – The maximum use of solid waste source reduction, reuse, recycling, composting, and environmentally-safe transformation of wastes, consistent with the protection of the public's health and safety, shall be promoted.

Central Salinas County Area Plan**:** None of the policies provided in the CSCA are applicable to the Proposed Project.

City of Greenfield General Plan**:** Policies in the City's General Plan have been adopted for the purpose of avoiding or mitigating utilities and service system impacts from development projects. Policies applicable to the Proposed Project are presented below.

Policy 4.9.1 – Promote the reduction of the amount of waste disposed of in landfills by: 1) reducing the amount of solid waste generated in the city (waste reduction); 2) reusing as much of the solid waste as possible (recycling); 3) utilizing the energy and nutrient value of the solid waste (waste to energy and composting); and 4) properly disposing of the remaining solid waste (landfill disposal).

Policy 4.9.2 – Coordinate waste disposal with the Salinas Valley Solid Waste Authority.

Policy 4.9.3 – Encourage the development of waste transfer, processing, and disposal facilities that satisfy the highest established environmental standards and regulations.

Policy 4.9.5 – Encourage solid waste resource recovery (including recycling, composting, and waste to energy) so as to extend the life of sanitary landfills, reduce the environmental impact of solid waste disposal, and to make use of a valuable resource, provided that specific resource recovery programs are economically and environmentally feasible.

Goal 4.11 – Maintain adequate sewer collection, treatment, and disposal in a manner that meets the current and projected needs of the community. . .

> **Policy 4.11.1** – Coordinate future development with the capacity of the Greenfield Wastewater Treatment Plant to ensure facilities are available for proper wastewater disposal. .

Policy 4.11.4 – Plan and secure permits for expanded wastewater treatment before the need is immediate.

- Program 4.11.C – At the project approval stage, new development shall demonstrate that wastewater treatment capacity can be provided. The City shall obtain assurance that 1) capacity exists in the wastewater treatment system if a development project is built in a set period of time, or 2) capacity will be provided by a funded program or other mechanism. This finding will be based on information furnished or made available to the City from consultations with the Greenfield Wastewater Treatment Plant, the applicant, or other resources.

Policy 6.6.1 – Ensure that adequate water, sewer, and storm drainage utilities, fire and police services, and school sites are provided to accommodate new development and future residents.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which would cause significant environmental effects?	☐	☐	☐	■
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 statuses and regulations related to solid waste?	☐	■	☐	☐

Impact Discussion

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

The Proposed Project consists of the construction of a new WWTP facility, and the subsequent demolition of the existing WWTP. Additionally, the Proposed Project would install recycled water infrastructure for use of non-potable water supply on adjacent agricultural parcels. The Proposed Project would improve utilities onsite and in portions of Walnut Avenue and the access road between the WWTP and effluent disposal site. The potential adverse effects associated with the Proposed Project are evaluated in this IS/MND. No additional impacts would occur beyond those described in this document. No impact would occur.

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

The Proposed Project would have sufficient water supplies to serve the Proposed Project and reasonably foreseeable future development during normal, dry, and multiple dry years. The existing WWTP does not have a potable water supply source, rather, an on-site well provides non-potable water to the site. The Proposed Project would abandon the existing on-site well and install 3,700 linear feet of 12-inch pipeline along Walnut Avenue to connect to the existing potable water line owned and operated by the City of Greenfield.

The City currently operates three (3) wells that extract groundwater from the subbasin and two storage tanks. In 2019, the wells supplied 579 million gallons of water to the City of Greenfield. In March 2021, the City of Greenfield published the *2021 Water Master Plan Update* which reviewed the City of Greenfield's water distribution system against the anticipated growth of the city. Based on the findings of the 2021 Water Master Plan update, the wells provide adequate water supply, however, the lack of redundant capacity could present capacity limitations during peak usage. The lack of redundant capacity could require the City to impose use restrictions in the future. However, anticipated water demand associated with WWTP operation would be insignificant (approximately 1,000 gallons per day) and would not substantially increase water demand beyond existing demand. Moreover, the Proposed Project also includes the use of recycled water for agricultural irrigation purposes, which would reduce groundwater and promote groundwater recharge.

While the Proposed Project would require non-potable water for dust control during construction, it is expected that this water could be provided from the existing on-site well. Moreover, the Proposed Project would reduce groundwater pumping in the basin by providing a supplemental source of irrigation supply to serve adjacent agricultural uses. For these reasons, the Proposed Project would have a net beneficial impact; this impact is less than significant.

c. *Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?*

The Proposed Project would not result in a determination by the wastewater treatment provider that it has inadequate capacity to serve the Proposed Project. The Proposed Project consists of the construction of a new WWTP and the subsequent demolition of the existing WWTP, construction of recycled water infrastructure and use of recycled water on adjacent agricultural parcels. The Proposed Project would improve wastewater treatment services in the City of Greenfield. Due to the nature of the Proposed Project, no impact would occur.

d. and e. 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? Comply with federal, state, and local management and reduction statuses and regulations related to solid waste?

The Proposed Project would comply with all federal, state, and local statues and solid waste regulations. All waste generated in connection with the Project would be managed in accordance with all applicable federal, state, and local statutes and regulations to the extent they are applicable to the Proposed Project. However, The Proposed Project would generate solid waste during construction and operation that could exceed state or local standards or be in excess of the capacity of local infrastructure and otherwise impair the attainment of solid waste reduction goals. Solid waste generated from the Project would be disposed of offsite at the Johnson Canyon Landfill in Gonzales, California. Johnson Canyon Landfill has a maximum permitted capacity of 18,500,000 cubic yards and is estimated to have a disposal capacity through the year 2066 (CalRecycle, 2023). The permitted maximum daily tonnage of the landfill is 1,694 tons per day. At the time this IS/MND was prepared, waste generated from both construction and operation was not quantifiable. Therefore, conservatively, solid waste generated by construction and operation could have an impact on landfill capacity and would present a potentially significant impact. To ensure waste generated from the Proposed Project remains less than significant, the Proposed Project would be required to implement **Mitigation Measure UTL-1**, identified below.

> **Mitigation Measure UTL-1:** Prior to start of construction, the contractor shall prepare and submit a Construction Waste Reduction and Recycling Plan. The contractor shall prepare and implement a construction waste reduction and recycling plan identifying the types of debris the project will generate and the manner in which those waste streams will be handled. In accordance with the California Integrated Waste Management Act of 1989, the plan shall emphasize source reduction measures, followed by recycling and composting methods, to ensure that construction and demolition waste generated by the Proposed Project is managed consistent with applicable statutes and regulations. In accordance with the California Green Building Standards Code and local regulations, the plan shall specify that all trees, stumps, rocks, and associated vegetation and soils, and 50 percent of all other nonhazardous construction and demolition waste, be diverted from landfill disposal. The plan shall be prepared in coordination with the Salinas Valley Solid Waste Authority and be consistent with Monterey County's Integrated Waste Management Plan. Upon project completion, the City of Greenfield Public Works Director shall collect the receipts from the contractor(s) and maintain them as documentation that the waste reduction, recycling, and diversion goals have been met.

4.17 Mandatory Findings of Significance

Does the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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	☐	■	☐	☐

Does the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	☐	■	☐

Impact Discussion

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

The Proposed Project would not 1) degrade the quality of environment, 2) substantially reduce the habitat of a fish or wildlife species, 3) cause a fish or wildlife population to drop below self-sustaining levels, 4) threaten or eliminate a plant or animal community, 5) reduce the number or restrict the range of a rare or endangered plant or animal, 6) eliminate important examples of major periods of California history or prehistory. The Proposed Project would result in temporary construction-related impacts that would be mitigated to a less than significant level through the incorporated of mitigation measures identified in this IS/MND. All operational impacts associated with the Proposed Project would also be reduced to less than significant though the incorporation and implementation of mitigation measures. This represents a less than significant impact. No additional mitigation is necessary beyond mitigation identified in each of the respective topical CEQA sections contained in this IS/MND.

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.)?

The Proposed Project would not result in a cumulatively considerable adverse environmental effect. To determine whether a cumulative effect requires an Environmental Impact Report ("EIR"), the lead agency shall consider whether the impact is significant and whether the effects of the project are cumulatively considerable (CEQA Guidelines Section 15064(h)(1)). This IS/MND contains mitigation to ensure that all potential impacts are minimized to a less than significant level. CEQA allows a lead agency to determine that a project's contribution to a potential cumulative impact is not considerable and thus not significant when mitigation measures identified in the initial study will render those potential impacts less than considerable (CEQA Guidelines 15064(h)(2)). The Proposed Project would replace the existing WWTP with a modernized facility that would improve water quality and comply with regulatory requirements set forth by the RWQCB. Improvements to the WWTP would improve the reliability of the system and accommodate future flows. In addition to improving the WWTP, the Proposed Project includes the installation of recycled water infrastructure and anticipated recycled water use for agricultural irrigation purposes. The use of recycled water would reduce the reliance of groundwater for irrigation and would contribute to overall groundwater recharge. Thus, the Proposed Project would have a net benefit on water quality. As discussed throughout this IS/MND, the Proposed Project would not increase the WWTP capacity beyond existing permitted levels (i.e., 2.0 mgd) and therefore would not cause a cumulative effect when considered with other future planned developments. Moreover, construction and operation of the Proposed Project would occur in previously disturbed and developed areas. Where construction and operational effects were identified, mitigation measures were established to minimize impacts to less than significant.

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

The Proposed Project would not have a substantial adverse effect on human beings, either directly or indirectly. This IS/MND contains mitigation measures to ensure that all potential impacts would be minimized to a less than significant level. The Proposed Project would have a beneficial impact by improving the reliability of the WWTP system, accommodating future flows, improving water quality, and producing recycled water and therefore reducing reliance on groundwater.

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Chapter 5. References

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Appendix A
CalEEMod Air Quality Analysis

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Greenfield WWTP Detailed Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Greenfield WWTP
Construction Start Date	1/6/2025
Operational Year	2027
Lead Agency	City of Greenfield
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	3.60
Precipitation (days)	0.80
Location	36.34108338533866, -121.2242098166183
County	Monterey
City	Greenfield
Air District	Monterey Bay ARD
Air Basin	North Central Coast
TAZ	3265
EDFZ	6
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.21

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description

General Light Industry	20.1	1000sqft	15.0	20,120	0.00	0.00	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-2*	Limit Heavy-Duty Diesel Vehicle Idling
Construction	C-9	Use Dust Suppressants
Construction	C-10-B	Water Active Demolition Sites
Construction	C-11	Limit Vehicle Speeds on Unpaved Roads
Construction	C-12	Sweep Paved Roads
Waste	S-4*	Recycle Demolished Construction Material

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	3.31	30.7	29.6	0.07	1.25	32.7	34.0	1.15	4.03	5.18	7,524	0.32	0.18	7,589
Mit.	3.31	30.7	29.6	0.07	1.25	32.7	34.0	1.15	4.03	5.18	7,524	0.32	0.18	7,589
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	10.0	31.7	30.9	0.07	1.37	32.7	34.0	1.26	4.03	5.18	7,516	0.33	0.18	7,579
Mit.	10.0	31.7	30.9	0.07	1.37	32.7	34.0	1.26	4.03	5.18	7,516	0.33	0.18	7,579

% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.76	16.3	16.3	0.03	0.66	15.7	16.3	0.61	1.85	2.46	3,778	0.16	0.08	3,808
Mit.	1.76	16.3	16.3	0.03	0.66	15.7	16.3	0.61	1.84	2.46	3,778	0.16	0.08	3,808
% Reduced	—	—	—	—	—	< 0.5%	< 0.5%	—	< 0.5%	< 0.5%	—	—	—	—
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.32	2.98	2.98	0.01	0.12	2.86	2.98	0.11	0.34	0.45	626	0.03	0.01	630
Mit.	0.32	2.98	2.98	0.01	0.12	2.86	2.98	0.11	0.34	0.45	626	0.03	0.01	630
% Reduced	—	—	—	—	—	< 0.5%	< 0.5%	—	< 0.5%	< 0.5%	—	—	—	—

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	3.31	30.7	29.6	0.07	1.25	32.7	34.0	1.15	4.03	5.18	7,524	0.32	0.18	7,589
2026	1.11	9.97	13.4	0.02	0.38	7.42	7.80	0.35	0.75	1.10	2,521	0.10	0.03	2,533
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	3.39	31.7	30.9	0.07	1.37	32.7	34.0	1.26	4.03	5.18	7,516	0.33	0.18	7,579
2026	1.11	9.98	13.4	0.02	0.38	10.5	10.9	0.35	1.07	1.36	2,518	0.10	0.03	2,530
2027	10.0	7.00	10.5	0.01	0.30	10.5	10.8	0.27	1.07	1.34	1,610	0.07	0.02	1,616
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	1.76	16.3	16.3	0.03	0.66	15.7	16.3	0.61	1.85	2.46	3,778	0.16	0.08	3,808
2026	0.76	6.80	9.20	0.02	0.26	5.65	5.91	0.24	0.57	0.81	1,694	0.07	0.02	1,702

2027	1.10	0.11	0.15	< 0.005	< 0.005	0.15	0.15	< 0.005	0.02	0.02	19.0	< 0.005	< 0.005	19.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.32	2.98	2.98	0.01	0.12	2.86	2.98	0.11	0.34	0.45	626	0.03	0.01	630
2026	0.14	1.24	1.68	< 0.005	0.05	1.03	1.08	0.04	0.10	0.15	280	0.01	< 0.005	282
2027	0.20	0.02	0.03	< 0.005	< 0.005	0.03	0.03	< 0.005	< 0.005	< 0.005	3.15	< 0.005	< 0.005	3.16

2.3. Construction Emissions by Year, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	3.31	30.7	29.6	0.07	1.25	32.7	34.0	1.15	4.03	5.18	7,524	0.32	0.18	7,589
2026	1.11	9.97	13.4	0.02	0.38	7.42	7.80	0.35	0.75	1.10	2,521	0.10	0.03	2,533
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	3.39	31.7	30.9	0.07	1.37	32.7	34.0	1.26	4.03	5.18	7,516	0.33	0.18	7,579
2026	1.11	9.98	13.4	0.02	0.38	10.5	10.9	0.35	1.07	1.36	2,518	0.10	0.03	2,530
2027	10.0	7.00	10.5	0.01	0.30	10.5	10.8	0.27	1.07	1.34	1,610	0.07	0.02	1,616
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	1.76	16.3	16.3	0.03	0.66	15.7	16.3	0.61	1.84	2.46	3,778	0.16	0.08	3,808
2026	0.76	6.80	9.20	0.02	0.26	5.65	5.91	0.24	0.57	0.81	1,694	0.07	0.02	1,702
2027	1.10	0.11	0.15	< 0.005	< 0.005	0.15	0.15	< 0.005	0.02	0.02	19.0	< 0.005	< 0.005	19.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.32	2.98	2.98	0.01	0.12	2.86	2.98	0.11	0.34	0.45	626	0.03	0.01	630
2026	0.14	1.24	1.68	< 0.005	0.05	1.03	1.08	0.04	0.10	0.15	280	0.01	< 0.005	282
2027	0.20	0.02	0.03	< 0.005	< 0.005	0.03	0.03	< 0.005	< 0.005	< 0.005	3.15	< 0.005	< 0.005	3.16

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.95	0.25	2.93	< 0.005	0.01	20.6	20.6	< 0.005	2.11	2.12	6,696	3.29	0.17	6,835
Mit.	0.95	0.25	2.93	< 0.005	0.01	20.6	20.6	< 0.005	2.11	2.12	6,696	3.29	0.17	6,835
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.80	0.28	2.16	< 0.005	< 0.005	20.6	20.6	< 0.005	2.11	2.12	6,674	3.29	0.17	6,811
Mit.	0.80	0.28	2.16	< 0.005	< 0.005	20.6	20.6	< 0.005	2.11	2.12	6,674	3.29	0.17	6,811
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.86	0.25	2.43	< 0.005	< 0.005	18.7	18.7	< 0.005	1.91	1.92	6,638	3.29	0.17	6,775
Mit.	0.86	0.25	2.43	< 0.005	< 0.005	18.7	18.7	< 0.005	1.91	1.92	6,638	3.29	0.17	6,775
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.16	0.05	0.44	< 0.005	< 0.005	3.41	3.42	< 0.005	0.35	0.35	1,099	0.54	0.03	1,122
Mit.	0.16	0.05	0.44	< 0.005	< 0.005	3.41	3.42	< 0.005	0.35	0.35	1,099	0.54	0.03	1,122
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.36	0.24	2.06	< 0.005	< 0.005	20.6	20.6	< 0.005	2.11	2.12	453	0.02	0.02	462
Area	0.58	0.01	0.88	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	3.60	< 0.005	< 0.005	3.61
Energy	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	6,203	1.00	0.12	6,265
Water	—	—	—	—	—	—	—	—	—	—	23.0	0.92	0.02	52.5
Waste	—	—	—	—	—	—	—	—	—	—	13.4	1.34	0.00	47.0
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	5.24
Total	0.95	0.25	2.93	< 0.005	0.01	20.6	20.6	< 0.005	2.11	2.12	6,696	3.29	0.17	6,835
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.36	0.28	2.16	< 0.005	< 0.005	20.6	20.6	< 0.005	2.11	2.12	434	0.03	0.02	442
Area	0.44	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	6,203	1.00	0.12	6,265
Water	—	—	—	—	—	—	—	—	—	—	23.0	0.92	0.02	52.5
Waste	—	—	—	—	—	—	—	—	—	—	13.4	1.34	0.00	47.0
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	5.24
Total	0.80	0.28	2.16	< 0.005	< 0.005	20.6	20.6	< 0.005	2.11	2.12	6,674	3.29	0.17	6,811
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.32	0.24	1.83	< 0.005	< 0.005	18.7	18.7	< 0.005	1.91	1.92	395	0.02	0.02	403
Area	0.54	0.01	0.60	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	2.46	< 0.005	< 0.005	2.47
Energy	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	6,203	1.00	0.12	6,265
Water	—	—	—	—	—	—	—	—	—	—	23.0	0.92	0.02	52.5
Waste	—	—	—	—	—	—	—	—	—	—	13.4	1.34	0.00	47.0
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	5.24
Total	0.86	0.25	2.43	< 0.005	< 0.005	18.7	18.7	< 0.005	1.91	1.92	6,638	3.29	0.17	6,775

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.06	0.04	0.33	< 0.005	< 0.005	3.41	3.41	< 0.005	0.35	0.35	65.4	< 0.005	< 0.005	66.7
Area	0.10	< 0.005	0.11	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.41	< 0.005	< 0.005	0.41
Energy	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	1,027	0.17	0.02	1,037
Water	—	—	—	—	—	—	—	—	—	—	3.81	0.15	< 0.005	8.68
Waste	—	—	—	—	—	—	—	—	—	—	2.23	0.22	0.00	7.79
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	0.87
Total	0.16	0.05	0.44	< 0.005	< 0.005	3.41	3.42	< 0.005	0.35	0.35	1,099	0.54	0.03	1,122

2.6. Operations Emissions by Sector, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.36	0.24	2.06	< 0.005	< 0.005	20.6	20.6	< 0.005	2.11	2.12	453	0.02	0.02	462
Area	0.58	0.01	0.88	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	3.60	< 0.005	< 0.005	3.61
Energy	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	6,203	1.00	0.12	6,265
Water	—	—	—	—	—	—	—	—	—	—	23.0	0.92	0.02	52.5
Waste	—	—	—	—	—	—	—	—	—	—	13.4	1.34	0.00	47.0
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	5.24
Total	0.95	0.25	2.93	< 0.005	0.01	20.6	20.6	< 0.005	2.11	2.12	6,696	3.29	0.17	6,835
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.36	0.28	2.16	< 0.005	< 0.005	20.6	20.6	< 0.005	2.11	2.12	434	0.03	0.02	442
Area	0.44	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	6,203	1.00	0.12	6,265
Water	—	—	—	—	—	—	—	—	—	—	23.0	0.92	0.02	52.5

Waste	—	—	—	—	—	—	—	—	—	—	13.4	1.34	0.00	47.0
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	5.24
Total	0.80	0.28	2.16	< 0.005	< 0.005	20.6	20.6	< 0.005	2.11	2.12	6,674	3.29	0.17	6,811
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.32	0.24	1.83	< 0.005	< 0.005	18.7	18.7	< 0.005	1.91	1.92	395	0.02	0.02	403
Area	0.54	0.01	0.60	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	2.46	< 0.005	< 0.005	2.47
Energy	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	6,203	1.00	0.12	6,265
Water	—	—	—	—	—	—	—	—	—	—	23.0	0.92	0.02	52.5
Waste	—	—	—	—	—	—	—	—	—	—	13.4	1.34	0.00	47.0
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	5.24
Total	0.86	0.25	2.43	< 0.005	< 0.005	18.7	18.7	< 0.005	1.91	1.92	6,638	3.29	0.17	6,775
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.06	0.04	0.33	< 0.005	< 0.005	3.41	3.41	< 0.005	0.35	0.35	65.4	< 0.005	< 0.005	66.7
Area	0.10	< 0.005	0.11	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.41	< 0.005	< 0.005	0.41
Energy	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	1,027	0.17	0.02	1,037
Water	—	—	—	—	—	—	—	—	—	—	3.81	0.15	< 0.005	8.68
Waste	—	—	—	—	—	—	—	—	—	—	2.23	0.22	0.00	7.79
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	0.87
Total	0.16	0.05	0.44	< 0.005	< 0.005	3.41	3.42	< 0.005	0.35	0.35	1,099	0.54	0.03	1,122

3. Construction Emissions Details

3.1. Demolition (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.40	22.2	19.9	0.03	0.92	—	0.92	0.84	—	0.84	3,425	0.14	0.03	3,437
Demolition	—	—	—	—	—	0.69	0.69	—	0.10	0.10	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.20	1.82	1.64	< 0.005	0.08	—	0.08	0.07	—	0.07	282	0.01	< 0.005	282
Demolition	—	—	—	—	—	0.06	0.06	—	0.01	0.01	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.33	0.30	< 0.005	0.01	—	0.01	0.01	—	0.01	46.6	< 0.005	< 0.005	46.8
Demolition	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.65	0.00	0.00	10.5	10.5	0.00	1.07	1.07	102	0.01	< 0.005	104
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	0.74	0.26	< 0.005	0.01	11.4	11.4	0.01	1.16	1.17	548	0.03	0.09	575

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	< 0.005	0.05	0.00	0.00	0.87	0.87	0.00	0.09	0.09	8.44	< 0.005	< 0.005	8.58
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.06	0.02	< 0.005	< 0.005	0.94	0.94	< 0.005	0.10	0.10	45.1	< 0.005	0.01	47.3
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	0.16	0.16	0.00	0.02	0.02	1.40	< 0.005	< 0.005	1.42
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.01	< 0.005	< 0.005	< 0.005	0.17	0.17	< 0.005	0.02	0.02	7.46	< 0.005	< 0.005	7.83

3.2. Demolition (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.40	22.2	19.9	0.03	0.92	—	0.92	0.84	—	0.84	3,425	0.14	0.03	3,437
Demolition	—	—	—	—	—	0.44	0.44	—	0.07	0.07	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.20	1.82	1.64	< 0.005	0.08	—	0.08	0.07	—	0.07	282	0.01	< 0.005	282
Demolition	—	—	—	—	—	0.04	0.04	—	0.01	0.01	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.33	0.30	< 0.005	0.01	—	0.01	0.01	—	0.01	46.6	< 0.005	< 0.005	46.8
Demolition	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.65	0.00	0.00	10.5	10.5	0.00	1.07	1.07	102	0.01	< 0.005	104
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	0.74	0.26	< 0.005	0.01	11.4	11.4	0.01	1.16	1.17	548	0.03	0.09	575
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	< 0.005	0.05	0.00	0.00	0.87	0.87	0.00	0.09	0.09	8.44	< 0.005	< 0.005	8.58
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.06	0.02	< 0.005	< 0.005	0.94	0.94	< 0.005	0.10	0.10	45.1	< 0.005	0.01	47.3
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	0.16	0.16	0.00	0.02	0.02	1.40	< 0.005	< 0.005	1.42
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.01	< 0.005	< 0.005	< 0.005	0.17	0.17	< 0.005	0.02	0.02	7.46	< 0.005	< 0.005	7.83

3.3. Site Preparation (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.31	31.6	30.2	0.05	1.37	—	1.37	1.26	—	1.26	5,295	0.21	0.04	5,314
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.09	0.87	0.83	< 0.005	0.04	—	0.04	0.03	—	0.03	145	0.01	< 0.005	146
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.16	0.15	< 0.005	0.01	—	0.01	0.01	—	0.01	24.0	< 0.005	< 0.005	24.1
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.08	0.75	0.00	0.00	12.3	12.3	0.00	1.24	1.24	119	0.01	0.01	121
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.02	0.00	0.00	0.34	0.34	0.00	0.03	0.03	3.28	< 0.005	< 0.005	3.34
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	0.06	0.06	0.00	0.01	0.01	0.54	< 0.005	< 0.005	0.55
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.4. Site Preparation (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.31	31.6	30.2	0.05	1.37	—	1.37	1.26	—	1.26	5,295	0.21	0.04	5,314
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.09	0.87	0.83	< 0.005	0.04	—	0.04	0.03	—	0.03	145	0.01	< 0.005	146
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.16	0.15	< 0.005	0.01	—	0.01	0.01	—	0.01	24.0	< 0.005	< 0.005	24.1
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.08	0.75	0.00	0.00	12.3	12.3	0.00	1.24	1.24	119	0.01	0.01	121
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.02	0.00	0.00	0.34	0.34	0.00	0.03	0.03	3.28	< 0.005	< 0.005	3.34
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	0.06	0.06	0.00	0.01	0.01	0.54	< 0.005	< 0.005	0.55
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.5. Grading (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.20	29.7	28.3	0.06	1.23	—	1.23	1.14	—	1.14	6,599	0.27	0.05	6,622
Dust From Material Movement	—	—	—	—	—	2.39	2.39	—	0.95	0.95	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.20	29.7	28.3	0.06	1.23	—	1.23	1.14	—	1.14	6,599	0.27	0.05	6,622
Dust From Material Movement	—	—	—	—	—	2.39	2.39	—	0.95	0.95	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.15	10.7	10.2	0.02	0.44	—	0.44	0.41	—	0.41	2,368	0.10	0.02	2,376
Dust From Material Movement	—	—	—	—	—	0.86	0.86	—	0.34	0.34	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.21	1.94	1.85	< 0.005	0.08	—	0.08	0.07	—	0.07	392	0.02	< 0.005	393
Dust From Material Movement	—	—	—	—	—	0.16	0.16	—	0.06	0.06	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.07	0.91	0.00	0.00	14.1	14.1	0.00	1.42	1.42	145	0.01	0.01	147
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.02	0.99	0.37	0.01	0.01	16.3	16.3	0.01	1.66	1.67	781	0.05	0.12	821

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.09	0.86	0.00	0.00	14.1	14.1	0.00	1.42	1.42	136	0.01	0.01	138
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.02	1.05	0.38	0.01	0.01	16.3	16.3	0.01	1.66	1.67	781	0.05	0.12	819
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.29	0.00	0.00	5.04	5.04	0.00	0.51	0.51	49.1	< 0.005	< 0.005	49.9
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	0.37	0.13	< 0.005	0.01	5.83	5.83	0.01	0.59	0.60	280	0.02	0.04	294
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.05	0.00	0.00	0.92	0.92	0.00	0.09	0.09	8.14	< 0.005	< 0.005	8.27
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.07	0.02	< 0.005	< 0.005	1.06	1.06	< 0.005	0.11	0.11	46.4	< 0.005	0.01	48.7

3.6. Grading (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.20	29.7	28.3	0.06	1.23	—	1.23	1.14	—	1.14	6,599	0.27	0.05	6,622
Dust From Material Movement	—	—	—	—	—	2.39	2.39	—	0.95	0.95	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.20	29.7	28.3	0.06	1.23	—	1.23	1.14	—	1.14	6,599	0.27	0.05	6,622
Dust From Material Movement	—	—	—	—	—	2.39	2.39	—	0.95	0.95	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.15	10.7	10.2	0.02	0.44	—	0.44	0.41	—	0.41	2,368	0.10	0.02	2,376
Dust From Material Movement	—	—	—	—	—	0.86	0.86	—	0.34	0.34	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.21	1.94	1.85	< 0.005	0.08	—	0.08	0.07	—	0.07	392	0.02	< 0.005	393
Dust From Material Movement	—	—	—	—	—	0.16	0.16	—	0.06	0.06	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.07	0.91	0.00	0.00	14.1	14.1	0.00	1.42	1.42	145	0.01	0.01	147
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.02	0.99	0.37	0.01	0.01	16.3	16.3	0.01	1.66	1.67	781	0.05	0.12	821

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.09	0.86	0.00	0.00	14.1	14.1	0.00	1.42	1.42	136	0.01	0.01	138
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.02	1.05	0.38	0.01	0.01	16.3	16.3	0.01	1.66	1.67	781	0.05	0.12	819
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.29	0.00	0.00	5.04	5.04	0.00	0.51	0.51	49.1	< 0.005	< 0.005	49.9
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	0.37	0.13	< 0.005	0.01	5.83	5.83	0.01	0.59	0.60	280	0.02	0.04	294
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.05	0.00	0.00	0.92	0.92	0.00	0.09	0.09	8.14	< 0.005	< 0.005	8.27
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.07	0.02	< 0.005	< 0.005	1.06	1.06	< 0.005	0.11	0.11	46.4	< 0.005	0.01	48.7

3.7. Building Construction (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.13	10.4	13.0	0.02	0.43	—	0.43	0.40	—	0.40	2,398	0.10	0.02	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	1.13	10.4	13.0	0.02	0.43	—	0.43	0.40	—	0.40	2,398	0.10	0.02	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.27	2.47	3.09	0.01	0.10	—	0.10	0.09	—	0.09	568	0.02	< 0.005	570
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.45	0.56	< 0.005	0.02	—	0.02	0.02	—	0.02	94.0	< 0.005	< 0.005	94.3
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.03	0.38	0.00	0.00	5.94	5.94	0.00	0.60	0.60	61.1	< 0.005	< 0.005	62.2
Vendor	< 0.005	0.10	0.05	< 0.005	< 0.005	1.48	1.48	< 0.005	0.15	0.15	65.0	< 0.005	0.01	68.0
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.36	0.00	0.00	5.94	5.94	0.00	0.60	0.60	57.6	< 0.005	< 0.005	58.4
Vendor	< 0.005	0.10	0.05	< 0.005	< 0.005	1.48	1.48	< 0.005	0.15	0.15	65.0	< 0.005	0.01	67.9
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.08	0.00	0.00	1.40	1.40	0.00	0.14	0.14	13.7	< 0.005	< 0.005	13.9
Vendor	< 0.005	0.02	0.01	< 0.005	< 0.005	0.35	0.35	< 0.005	0.04	0.04	15.4	< 0.005	< 0.005	16.1
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	< 0.005	< 0.005	0.01	0.00	0.00	0.26	0.26	0.00	0.03	0.03	2.27	< 0.005	< 0.005	2.31
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.06	0.06	< 0.005	0.01	0.01	2.55	< 0.005	< 0.005	2.66
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.8. Building Construction (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.13	10.4	13.0	0.02	0.43	—	0.43	0.40	—	0.40	2,398	0.10	0.02	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.13	10.4	13.0	0.02	0.43	—	0.43	0.40	—	0.40	2,398	0.10	0.02	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.27	2.47	3.09	0.01	0.10	—	0.10	0.09	—	0.09	568	0.02	< 0.005	570
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.45	0.56	< 0.005	0.02	—	0.02	0.02	—	0.02	94.0	< 0.005	< 0.005	94.3
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.03	0.38	0.00	0.00	5.94	5.94	0.00	0.60	0.60	61.1	< 0.005	< 0.005	62.2
Vendor	< 0.005	0.10	0.05	< 0.005	< 0.005	1.48	1.48	< 0.005	0.15	0.15	65.0	< 0.005	0.01	68.0
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.36	0.00	0.00	5.94	5.94	0.00	0.60	0.60	57.6	< 0.005	< 0.005	58.4
Vendor	< 0.005	0.10	0.05	< 0.005	< 0.005	1.48	1.48	< 0.005	0.15	0.15	65.0	< 0.005	0.01	67.9
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.08	0.00	0.00	1.40	1.40	0.00	0.14	0.14	13.7	< 0.005	< 0.005	13.9
Vendor	< 0.005	0.02	0.01	< 0.005	< 0.005	0.35	0.35	< 0.005	0.04	0.04	15.4	< 0.005	< 0.005	16.1
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	0.26	0.26	0.00	0.03	0.03	2.27	< 0.005	< 0.005	2.31
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.06	0.06	< 0.005	0.01	0.01	2.55	< 0.005	< 0.005	2.66
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.9. Building Construction (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	1.07	9.85	13.0	0.02	0.38	—	0.38	0.35	—	0.35	2,397	0.10	0.02	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.07	9.85	13.0	0.02	0.38	—	0.38	0.35	—	0.35	2,397	0.10	0.02	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.64	5.90	7.76	0.01	0.23	—	0.23	0.21	—	0.21	1,436	0.06	0.01	1,440
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	1.08	1.42	< 0.005	0.04	—	0.04	0.04	—	0.04	238	0.01	< 0.005	238
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.03	0.36	0.00	0.00	5.94	5.94	0.00	0.60	0.60	59.9	< 0.005	< 0.005	61.0
Vendor	< 0.005	0.09	0.04	< 0.005	< 0.005	1.48	1.48	< 0.005	0.15	0.15	63.8	< 0.005	0.01	66.8
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.03	0.34	0.00	0.00	5.94	5.94	0.00	0.60	0.60	56.5	< 0.005	< 0.005	57.3
Vendor	< 0.005	0.10	0.05	< 0.005	< 0.005	1.48	1.48	< 0.005	0.15	0.15	63.8	< 0.005	0.01	66.7
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.19	0.00	0.00	3.55	3.55	0.00	0.36	0.36	34.0	< 0.005	< 0.005	34.6
Vendor	< 0.005	0.06	0.03	< 0.005	< 0.005	0.88	0.88	< 0.005	0.09	0.09	38.2	< 0.005	0.01	40.0
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.65	0.65	0.00	0.07	0.07	5.63	< 0.005	< 0.005	5.72
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	0.16	0.16	< 0.005	0.02	0.02	6.33	< 0.005	< 0.005	6.62
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.10. Building Construction (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.07	9.85	13.0	0.02	0.38	—	0.38	0.35	—	0.35	2,397	0.10	0.02	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.07	9.85	13.0	0.02	0.38	—	0.38	0.35	—	0.35	2,397	0.10	0.02	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.64	5.90	7.76	0.01	0.23	—	0.23	0.21	—	0.21	1,436	0.06	0.01	1,440

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	1.08	1.42	< 0.005	0.04	—	0.04	0.04	—	0.04	238	0.01	< 0.005	238
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.03	0.36	0.00	0.00	5.94	5.94	0.00	0.60	0.60	59.9	< 0.005	< 0.005	61.0
Vendor	< 0.005	0.09	0.04	< 0.005	< 0.005	1.48	1.48	< 0.005	0.15	0.15	63.8	< 0.005	0.01	66.8
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.03	0.34	0.00	0.00	5.94	5.94	0.00	0.60	0.60	56.5	< 0.005	< 0.005	57.3
Vendor	< 0.005	0.10	0.05	< 0.005	< 0.005	1.48	1.48	< 0.005	0.15	0.15	63.8	< 0.005	0.01	66.7
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.19	0.00	0.00	3.55	3.55	0.00	0.36	0.36	34.0	< 0.005	< 0.005	34.6
Vendor	< 0.005	0.06	0.03	< 0.005	< 0.005	0.88	0.88	< 0.005	0.09	0.09	38.2	< 0.005	0.01	40.0
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.65	0.65	0.00	0.07	0.07	5.63	< 0.005	< 0.005	5.72
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	0.16	0.16	< 0.005	0.02	0.02	6.33	< 0.005	< 0.005	6.62
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.11. Paving (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.76	7.12	9.94	0.01	0.32	—	0.32	0.29	—	0.29	1,511	0.06	0.01	1,516
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.09	0.82	1.15	< 0.005	0.04	—	0.04	0.03	—	0.03	174	0.01	< 0.005	175
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.15	0.21	< 0.005	0.01	—	0.01	0.01	—	0.01	28.9	< 0.005	< 0.005	29.0
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.60	0.00	0.00	10.5	10.5	0.00	1.07	1.07	100	0.01	< 0.005	102

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.07	0.00	0.00	1.22	1.22	0.00	0.12	0.12	11.6	< 0.005	< 0.005	11.8
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	0.22	0.22	0.00	0.02	0.02	1.93	< 0.005	< 0.005	1.96
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.12. Paving (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.76	7.12	9.94	0.01	0.32	—	0.32	0.29	—	0.29	1,511	0.06	0.01	1,516
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.09	0.82	1.15	< 0.005	0.04	—	0.04	0.03	—	0.03	174	0.01	< 0.005	175

Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.15	0.21	< 0.005	0.01	—	0.01	0.01	—	0.01	28.9	< 0.005	< 0.005	29.0
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.60	0.00	0.00	10.5	10.5	0.00	1.07	1.07	100	0.01	< 0.005	102
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.07	0.00	0.00	1.22	1.22	0.00	0.12	0.12	11.6	< 0.005	< 0.005	11.8
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	0.22	0.22	0.00	0.02	0.02	1.93	< 0.005	< 0.005	1.96
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.13. Paving (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.74	6.94	9.95	0.01	0.30	—	0.30	0.27	—	0.27	1,511	0.06	0.01	1,516
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.01	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	2.96	< 0.005	< 0.005	2.97
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.49	< 0.005	< 0.005	0.49
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.05	0.56	0.00	0.00	10.5	10.5	0.00	1.07	1.07	98.4	0.01	< 0.005	99.9
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	0.19	< 0.005	< 0.005	0.20
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.03	< 0.005	< 0.005	0.03
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.14. Paving (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.74	6.94	9.95	0.01	0.30	—	0.30	0.27	—	0.27	1,511	0.06	0.01	1,516
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.01	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	2.96	< 0.005	< 0.005	2.97
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.49	< 0.005	< 0.005	0.49
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.05	0.56	0.00	0.00	10.5	10.5	0.00	1.07	1.07	98.4	0.01	< 0.005	99.9
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	0.19	< 0.005	< 0.005	0.20
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.03	< 0.005	< 0.005	0.03
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.15. Architectural Coating (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e

Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.11	0.83	1.13	< 0.005	0.02	—	0.02	0.02	—	0.02	134	0.01	< 0.005	134
Architectural Coatings	9.91	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.09	0.12	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	14.6	< 0.005	< 0.005	14.7
Architectural Coatings	1.09	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.02	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	2.42	< 0.005	< 0.005	2.43
Architectural Coatings	0.20	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.06	0.00	0.00	1.19	1.19	0.00	0.12	0.12	11.1	< 0.005	< 0.005	11.3
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	0.13	0.13	0.00	0.01	0.01	1.22	< 0.005	< 0.005	1.24
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	0.20	< 0.005	< 0.005	0.21
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.16. Architectural Coating (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.11	0.83	1.13	< 0.005	0.02	—	0.02	0.02	—	0.02	134	0.01	< 0.005	134
Architectural Coatings	9.91	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.09	0.12	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	14.6	< 0.005	< 0.005	14.7
Architectural Coatings	1.09	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.02	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	2.42	< 0.005	< 0.005	2.43
Architectural Coatings	0.20	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.06	0.00	0.00	1.19	1.19	0.00	0.12	0.12	11.1	< 0.005	< 0.005	11.3
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	0.13	0.13	0.00	0.01	0.01	1.22	< 0.005	< 0.005	1.24
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	0.20	< 0.005	< 0.005	0.21
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.36	0.24	2.06	< 0.005	< 0.005	20.6	20.6	< 0.005	2.11	2.12	453	0.02	0.02	462
Total	0.36	0.24	2.06	< 0.005	< 0.005	20.6	20.6	< 0.005	2.11	2.12	453	0.02	0.02	462
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.36	0.28	2.16	< 0.005	< 0.005	20.6	20.6	< 0.005	2.11	2.12	434	0.03	0.02	442
Total	0.36	0.28	2.16	< 0.005	< 0.005	20.6	20.6	< 0.005	2.11	2.12	434	0.03	0.02	442
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.06	0.04	0.33	< 0.005	< 0.005	3.41	3.41	< 0.005	0.35	0.35	65.4	< 0.005	< 0.005	66.7
Total	0.06	0.04	0.33	< 0.005	< 0.005	3.41	3.41	< 0.005	0.35	0.35	65.4	< 0.005	< 0.005	66.7

4.1.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.36	0.24	2.06	< 0.005	< 0.005	20.6	20.6	< 0.005	2.11	2.12	453	0.02	0.02	462
Total	0.36	0.24	2.06	< 0.005	< 0.005	20.6	20.6	< 0.005	2.11	2.12	453	0.02	0.02	462
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.36	0.28	2.16	< 0.005	< 0.005	20.6	20.6	< 0.005	2.11	2.12	434	0.03	0.02	442
Total	0.36	0.28	2.16	< 0.005	< 0.005	20.6	20.6	< 0.005	2.11	2.12	434	0.03	0.02	442
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.06	0.04	0.33	< 0.005	< 0.005	3.41	3.41	< 0.005	0.35	0.35	65.4	< 0.005	< 0.005	66.7
Total	0.06	0.04	0.33	< 0.005	< 0.005	3.41	3.41	< 0.005	0.35	0.35	65.4	< 0.005	< 0.005	66.7

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—

General Light Industry	—	—	—	—	—	—	—	—	—	—	6,203	1.00	0.12	6,265
Total	—	—	—	—	—	—	—	—	—	—	6,203	1.00	0.12	6,265
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	6,203	1.00	0.12	6,265
Total	—	—	—	—	—	—	—	—	—	—	6,203	1.00	0.12	6,265
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	1,027	0.17	0.02	1,037
Total	—	—	—	—	—	—	—	—	—	—	1,027	0.17	0.02	1,037

4.2.2. Electricity Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	6,203	1.00	0.12	6,265
Total	—	—	—	—	—	—	—	—	—	—	6,203	1.00	0.12	6,265
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	6,203	1.00	0.12	6,265

Total	—	—	—	—	—	—	—	—	—	—	6,203	1.00	0.12	6,265
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	1,027	0.17	0.02	1,037
Total	—	—	—	—	—	—	—	—	—	—	1,027	0.17	0.02	1,037

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

4.2.4. Natural Gas Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.43	—	—	—	—	—	—	—	—	—	—	—	—	—

Architectura Coatings	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.14	0.01	0.88	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	3.60	< 0.005	< 0.005	3.61
Total	0.58	0.01	0.88	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	3.60	< 0.005	< 0.005	3.61
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.43	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	0.44	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.08	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.02	< 0.005	0.11	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.41	< 0.005	< 0.005	0.41
Total	0.10	< 0.005	0.11	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.41	< 0.005	< 0.005	0.41

4.3.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.43	—	—	—	—	—	—	—	—	—	—	—	—	—

Architectura Coatings	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.14	0.01	0.88	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	3.60	< 0.005	< 0.005	3.61
Total	0.58	0.01	0.88	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	3.60	< 0.005	< 0.005	3.61
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.43	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	0.44	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.08	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.02	< 0.005	0.11	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.41	< 0.005	< 0.005	0.41
Total	0.10	< 0.005	0.11	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.41	< 0.005	< 0.005	0.41

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—

General Light Industry	—	—	—	—	—	—	—	—	—	—	23.0	0.92	0.02	52.5
Total	—	—	—	—	—	—	—	—	—	—	23.0	0.92	0.02	52.5
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	23.0	0.92	0.02	52.5
Total	—	—	—	—	—	—	—	—	—	—	23.0	0.92	0.02	52.5
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	3.81	0.15	< 0.005	8.68
Total	—	—	—	—	—	—	—	—	—	—	3.81	0.15	< 0.005	8.68

4.4.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	23.0	0.92	0.02	52.5
Total	—	—	—	—	—	—	—	—	—	—	23.0	0.92	0.02	52.5
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	23.0	0.92	0.02	52.5

Total	—	—	—	—	—	—	—	—	—	—	23.0	0.92	0.02	52.5
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	3.81	0.15	< 0.005	8.68
Total	—	—	—	—	—	—	—	—	—	—	3.81	0.15	< 0.005	8.68

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	13.4	1.34	0.00	47.0
Total	—	—	—	—	—	—	—	—	—	—	13.4	1.34	0.00	47.0
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	13.4	1.34	0.00	47.0
Total	—	—	—	—	—	—	—	—	—	—	13.4	1.34	0.00	47.0
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	2.23	0.22	0.00	7.79
Total	—	—	—	—	—	—	—	—	—	—	2.23	0.22	0.00	7.79

4.5.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	13.4	1.34	0.00	47.0
Total	—	—	—	—	—	—	—	—	—	—	13.4	1.34	0.00	47.0
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	13.4	1.34	0.00	47.0
Total	—	—	—	—	—	—	—	—	—	—	13.4	1.34	0.00	47.0
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	2.23	0.22	0.00	7.79
Total	—	—	—	—	—	—	—	—	—	—	2.23	0.22	0.00	7.79

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—

General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	5.24
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	5.24
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	5.24
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	5.24
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	0.87
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	0.87

4.6.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	5.24
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	5.24
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	5.24

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	5.24
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	0.87
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	0.87

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.7.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Sequestere	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Demolition	Demolition	1/6/2025	2/14/2025	5.00	30.0	—
Site Preparation	Site Preparation	2/15/2025	2/28/2025	5.00	10.0	—
Grading	Grading	3/1/2025	9/1/2025	5.00	131	—

Building Construction	Building Construction	9/2/2025	11/2/2026	5.00	305	—
Paving	Paving	11/3/2026	1/1/2027	5.00	44.0	—
Architectural Coating	Architectural Coating	1/2/2027	2/28/2027	5.00	40.0	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition	Rubber Tired Dozers	Diesel	Average	2.00	8.00	367	0.40
Demolition	Concrete/Industrial Saws	Diesel	Average	1.00	8.00	33.0	0.73
Demolition	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29
Building Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Paving	Pavers	Diesel	Average	2.00	8.00	81.0	0.42
Paving	Rollers	Diesel	Average	2.00	8.00	36.0	0.38

Paving	Paving Equipment	Diesel	Average	2.00	8.00	89.0	0.36
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition	Rubber Tired Dozers	Diesel	Average	2.00	8.00	367	0.40
Demolition	Concrete/Industrial Saws	Diesel	Average	1.00	8.00	33.0	0.73
Demolition	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29
Building Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Paving	Pavers	Diesel	Average	2.00	8.00	81.0	0.42
Paving	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Paving	Paving Equipment	Diesel	Average	2.00	8.00	89.0	0.36
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Demolition	—	—	—	—
Demolition	Worker	15.0	9.47	LDA,LDT1,LDT2
Demolition	Vendor	—	6.03	HHDT,MHDT
Demolition	Hauling	7.67	20.0	HHDT
Demolition	Onsite truck	—	—	HHDT
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	9.47	LDA,LDT1,LDT2
Site Preparation	Vendor	—	6.03	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	20.0	9.47	LDA,LDT1,LDT2
Grading	Vendor	—	6.03	HHDT,MHDT
Grading	Hauling	10.9	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	8.45	9.47	LDA,LDT1,LDT2
Building Construction	Vendor	3.30	6.03	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	9.47	LDA,LDT1,LDT2
Paving	Vendor	—	6.03	HHDT,MHDT

Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	1.69	9.47	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	6.03	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.3.2. Mitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Demolition	—	—	—	—
Demolition	Worker	15.0	9.47	LDA,LDT1,LDT2
Demolition	Vendor	—	6.03	HHDT,MHDT
Demolition	Hauling	7.67	20.0	HHDT
Demolition	Onsite truck	—	—	HHDT
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	9.47	LDA,LDT1,LDT2
Site Preparation	Vendor	—	6.03	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	20.0	9.47	LDA,LDT1,LDT2
Grading	Vendor	—	6.03	HHDT,MHDT
Grading	Hauling	10.9	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	8.45	9.47	LDA,LDT1,LDT2

Building Construction	Vendor	3.30	6.03	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	9.47	LDA,LDT1,LDT2
Paving	Vendor	—	6.03	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	1.69	9.47	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	6.03	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	0.00	0.00	30,180	10,060	—

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (Building Square Footage)	Acres Paved (acres)

Demolition	0.00	0.00	0.00	20,000	—
Grading	11,446	0.00	15.0	0.00	—
Paving	0.00	0.00	0.00	0.00	0.00

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	3	74%	74%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
General Light Industry	0.00	0%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2025	0.00	204	0.03	< 0.005
2026	0.00	204	0.03	< 0.005
2027	0.00	204	0.03	< 0.005

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
General Light Industry	99.8	40.0	101	33,351	540	217	545	180,613

5.9.2. Mitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
General Light Industry	99.8	40.0	101	33,351	540	217	545	180,613

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.1.2. Mitigated

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
0	0.00	8,000	12,000	—

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	250

5.10.4. Landscape Equipment - Mitigated

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	250

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
General Light Industry	11,100,000	204	0.0330	0.0040	0.00

5.11.2. Mitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
General Light Industry	11,100,000	204	0.0330	0.0040	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
General Light Industry	4,652,750	0.00

5.12.2. Mitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
General Light Industry	4,652,750	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)

General Light Industry	24.9	—

5.13.2. Mitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
General Light Industry	24.9	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
General Light Industry	Other commercial A/C and heat pumps	R-410A	2,088	0.30	4.00	4.00	18.0

5.14.2. Mitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
General Light Industry	Other commercial A/C and heat pumps	R-410A	2,088	0.30	4.00	4.00	18.0

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.15.2. Mitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor

5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)

5.17. User Defined

Equipment Type	Fuel Type

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

5.18.2.2. Mitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	20.8	annual days of extreme heat
Extreme Precipitation	1.55	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	26.2	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters

Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A

Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	35.2
AQ-PM	1.23
AQ-DPM	12.6
Drinking Water	78.8
Lead Risk Housing	42.0
Pesticides	90.6
Toxic Releases	0.13
Traffic	11.3
Effect Indicators	—
CleanUp Sites	40.8
Groundwater	14.3
Haz Waste Facilities/Generators	80.2
Impaired Water Bodies	51.2
Solid Waste	52.9

Sensitive Population	—
Asthma	52.7
Cardio-vascular	80.2
Low Birth Weights	67.9
Socioeconomic Factor Indicators	—
Education	95.7
Housing	23.8
Linguistic	92.6
Poverty	76.6
Unemployment	25.2

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	24.48351084
Employed	54.30514564
Median HI	37.2770435
Education	—
Bachelor's or higher	3.426151675
High school enrollment	100
Preschool enrollment	23.26446811
Transportation	—
Auto Access	80.12318748
Active commuting	23.49544463
Social	—
2-parent households	81.27807006

Voting	38.67573463
Neighborhood	—
Alcohol availability	97.0101373
Park access	39.53548056
Retail density	2.1429488
Supermarket access	43.07712049
Tree canopy	3.105350956
Housing	—
Homeownership	56.42243039
Housing habitability	52.44450148
Low-inc homeowner severe housing cost burden	82.39445656
Low-inc renter severe housing cost burden	96.63800847
Uncrowded housing	2.75888618
Health Outcomes	—
Insured adults	7.789041447
Arthritis	0.0
Asthma ER Admissions	66.7
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0
Life Expectancy at Birth	67.1
Cognitively Disabled	80.8
Physically Disabled	77.4
Heart Attack ER Admissions	61.0

Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	19.6
Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	0.1
SLR Inundation Area	0.0
Children	6.8
Elderly	98.5
English Speaking	5.4
Foreign-born	85.2
Outdoor Workers	0.8
Climate Change Adaptive Capacity	—
Impervious Surface Cover	83.0
Traffic Density	4.4
Traffic Access	0.0
Other Indices	—
Hardship	89.7
Other Decision Support	—
2016 Voting	40.3

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	62.0
Healthy Places Index Score for Project Location (b)	36.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	Yes
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Construction: Construction Phases	Per construction schedule, construction will start in January 2025 and be complete in March 2027.
Land Use	Per project plans, there would be ~15 acres of disturbance
Construction: Dust From Material Movement	Grading would impact ~15 acres. Per the IS/MND the Proposed Project would require approximately 120,588 cubic yards of excavation, 82,104 cubic yards of fill, and approximately 11,446 cubic yards of soil stabilization material. Where appropriate, excavated materials would be used as backfill. All grading activities will be balanced and therefore should not result in a net export.
Construction: On-Road Fugitive Dust	Majority of roads are paved.
Operations: Road Dust	Majority of roads are paved.

Operations: Architectural Coatings	Proposed Project is a wastewater treatment facility. It will not require a high rate of reapplication of paint.
Operations: Energy Use	Per project plans, WWTP would require 11,100,000 kWh/year. No natural gas would be used to operate the plant.

Appendix B

Biological Resource Report

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Biological Resources Report

Greenfield Wastewater Treatment Plant Improvement
Greenfield, California

November 2023

Prepared by

Denise Duffy & Associates, Inc.
Contact: Matt Johnson
947 Cass St. Suite 5
Monterey, California 93940

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1.0 INTRODUCTION

1.1 Project Description

Denise Duffy and Associates, Inc. (DD&A) was contracted by the City of Greenfield Public Works Department to assess the biological resources for the Greenfield Wastewater Treatment Plant Improvement Project (project). The project is located in the northeast corner of Walnut Avenue within the City of Greenfield, California in Monterey County (County). Construction and operation of the project would be located at the existing WWTP, effluent disposal field, and existing agricultural field located on Accessors Parcel Numbers (APN's) 109-031-014-000, 109-031-013-000, 109-031-005-000 (**Figure 1**). The survey area is situated at an elevation of approximately 70 meters above mean sea level within the U.S. Geological Survey (USGS) Greenfield 7.5-minute quadrangle. Land use south, east, and west of the survey area is exclusively agricultural, while the floodplain and Salinas River lie immediately north.

The City of Greenfield (City) owns and operates an existing WWTP. The WWTP was originally constructed in the 1950's and over the course of several decades has been upgraded and expanded to receive, treat, and dispose of municipal wastewater. Currently the WWTP is designed and permitted to receive one (2) million gallons per day (mgd) wastewater. The WWTP facilities consist of headworks, primary clarifiers, secondary biological treatment provided by aerated ponds, and effluent disposal provided by percolation ponds and disposal fields.

The Proposed Project would improve the performance of the existing WWTP to ensure the facility can accommodate future flows and comply with current water quality standards. The Proposed Project consists of improvements to the existing WWTP, installation of recycled water infrastructure, and expansion of effluent spray and percolation fields as recommended by the Wallace Group and the Master Plan (**Figure 2**). Improvements to the existing WWTP include headworks, equalization basin, an influent pump station, fine screens, tertiary filtration, UV disinfection, effluent pump station, 3W pump station, solids handling, and operation/maintenance buildings. The Proposed Project would also include piping within the WWTP site and 3,700 linear feet of new potable water supply piping within the right-of-way of Walnut Avenue down to 2nd Avenue. The Proposed Project would also include construction of recycled water infrastructure, including distribution pipelines, a recycled water pump station, and recycled water storage basins. More specifically, the existing aeration ponds #1 and #2 would be converted into recycled water storage basins. The pump station would be constructed between effluent storage ponds #1 and #2 on an above grade concrete pad. This component also includes 5,150 linear feet of recycled water pipelines, which would be constructed within the existing right-of-way of Walnut Avenue and the existing dirt access road connecting the WWTP with the existing effluent disposal site. The Proposed Project is accessible from Highway 101 and Walnut Avenue. The Proposed Project would include improvements to site access through the reconstruction of Walnut Avenue, construction of new internal access roads, and public and employee parking.

For a more detailed description, please refer to *City of Greenfield Wastewater Treatment Plant Upgrade Project Preliminary Design Report* prepared by HydroScience Engineers (2023).

This report presents the findings of a biological resource assessment conducted by DD&A for the project. The emphasis of this study is to describe existing biological resources, identify any special-status species and sensitive habitats, and assess potential impacts that may occur to biological resources within and adjacent to the survey area, and recommend appropriate avoidance, minimization, and mitigation measures necessary to reduce those impacts to a less-than-significant level in accordance with local and state ordinances, including the California Environmental Quality Act (CEQA).

1.2 Summary of Results

The survey area consists of three habitat classifications: ruderal/disturbed, active agriculture, and scrub. A portion of the survey area is also developed.

No special-status plant species were observed or have potential to occur within the survey area. However, two special-status wildlife species, white-tailed kite (*Elanus leucurus*) and San Joaquin whipsnake (*Masticophis flagellum ruddocki*) have the potential to occur within the survey area. Additionally, large trees within and adjacent to the survey area may provide suitable nesting habitat for protected avian species.

Avoidance, minimization, and mitigation measures are included in this document to avoid or reduce impacts to these sensitive biological resources to a less than significant level under CEQA.

Vicinity Map	Date 11/3/2023 Scale 1 in = 0.4 mi	DENISE DUFFY & ASSOCIATES, INC. Planning and Environmental Consulting	Figure 1

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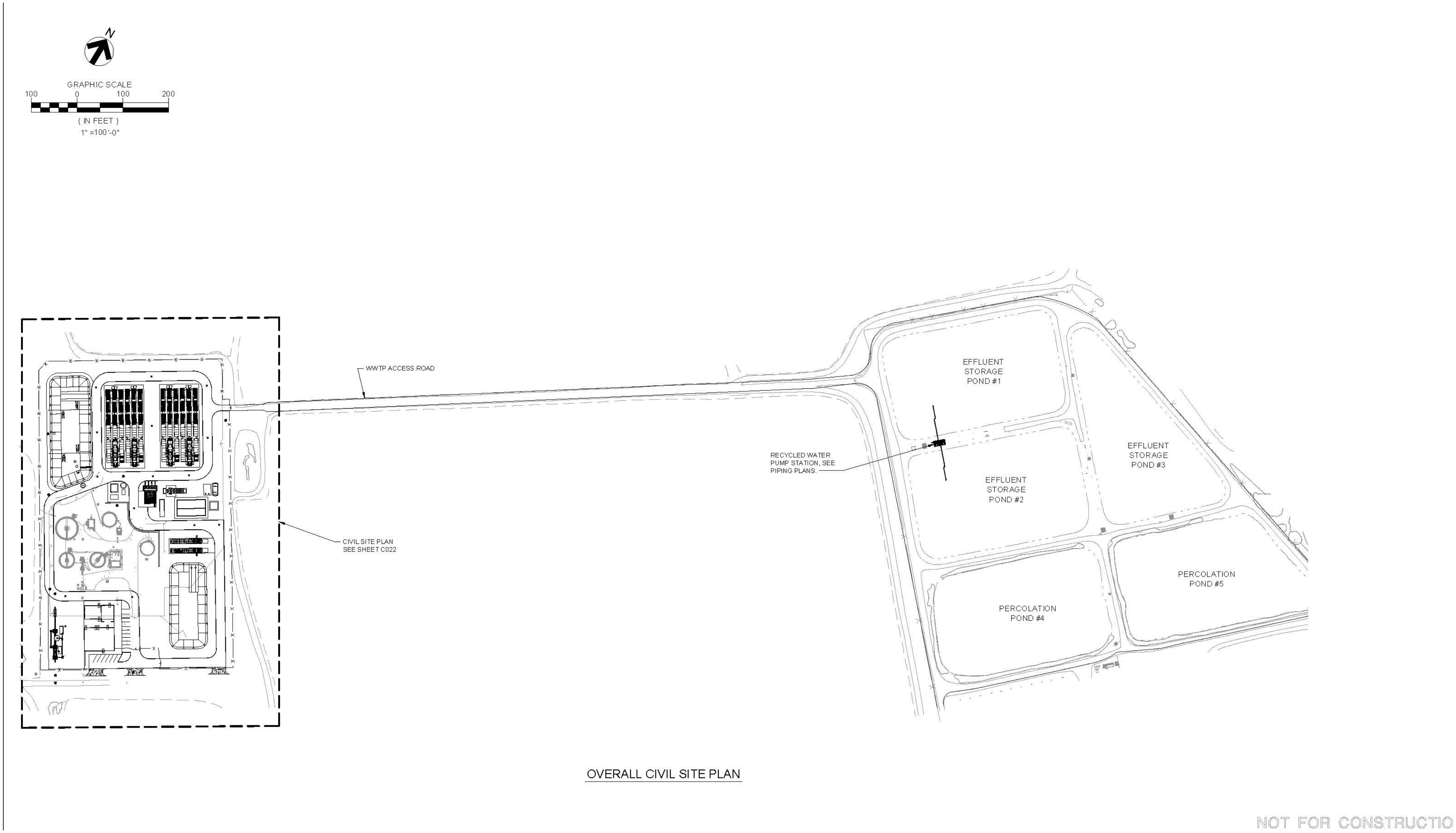

Source: HydroScience. June 2023. Wastewater Upgrade Project Preliminary Design Report.

Proposed Project Site Plan	Date 11/03/2023 Scale N/A	**Denise Duffy & Associates, Inc.** PLANNING AND ENVIRONMENTAL CONSULTING	Figure 2

Greenfield Wastewater Treatment Plant
Improvement Project - Survey Area Map

Date
11/29/2023

Scale
1 in = 703 ft

DENISE DUFFY & ASSOCIATES, INC.
Planning and Environmental Consulting

Figure
3

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2.0 METHODS

2.1 Personnel and Survey Dates

DD&A Environmental Scientist, Kimiya Ghadiri, evaluated the survey area on May 17, 2023. The survey area consisted of all components of the project described above in the project description (**Figure 3**). Survey methods included walking the survey area to identify general vegetation types, identifying all plant species to the intraspecific taxon necessary to eliminate them as being special-status species, and identifying potential habitat for special-status plant species. Concurrently, reconnaissance-level wildlife habitat surveys were conducted to identify suitable habitat and observe any special-status wildlife species. Data collected during the surveys were used to assess the environmental conditions of the survey area and its surroundings, evaluate environmental constraints at the site and within the local vicinity, and provide a basis for recommendations to minimize and avoid impacts.

The project parcel was evaluated for botanical resources following the applicable guidelines outlined in *Guidelines for Conducting and Reporting Botanical Inventories for Federally listed, Proposed and Candidate Plants* (U.S. Fish and Wildlife Service [Service], 2000), *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFW, 2018), and California Native Plant Society (CNPS) *Botanical Survey Guidelines* (CNPS, 2001).

2.2 Special-Status Species

Special-status species are those plants and animals that have been formally listed or proposed for listing as endangered or threatened or are candidates for such listing under the ESA or the California Endangered Species Act (CESA). Listed species are afforded legal protection under the ESA and CESA. Species that meet the definition of rare or endangered under the CEQA Section 15380 are also considered special-status species. Animals on the CDFW's list of "species of special concern" (most of which are species whose breeding populations in California may face extirpation if current population trends continue) meet this definition and are typically provided management consideration through the CEQA process, although they are not legally protected under the ESA or CESA. Additionally, the CDFW also includes some animal species that are not assigned any of the other status designations on their "Special Animals" list; however, these species have no legal or protection status.

Plants listed as rare under the California Native Plant Protection Act (CNPPA) or included in CNPS California Rare Plant Ranks (CRPR) 1A, 1B, 2A, and 2B are also treated as special-status species as they meet the definitions of Sections 2062 and 2067 of the CESA and in accordance with CEQA Guidelines Section 15380. In general, the CDFW requires that plant species on CRPR 1A (Plants presumed extirpated in California and Either Rare or Extinct Elsewhere), CRPR 1B (Plants rare, threatened, or endangered in California and elsewhere), CRPR 2A (Plants presumed extirpated in California, but more common elsewhere); and CRPR 2B (Plants rare, threatened, or endangered in California, but more common elsewhere) of the CNPS *Inventory of Rare and Endangered Vascular Plants of California* (CNPS, 2023) be fully considered during the preparation of environmental documents relating to CEQA. CNPS CRPR 4 species (plants of limited distribution) may, but generally do not, meet the definitions of Sections 2062 and 2067 of the CESA, and are not typically considered in environmental documents relating to CEQA. While other species (i.e., CRPR 3 or 4 species) are sometimes found in database searches or within the literature, these were not included within the analysis as they did not meet the definitions of Section 2062 and 2067 of the CESA.

Raptors (e.g., eagles, hawks, and owls) and their nests are protected in California under Fish and Game Code Section 3503.5. Section 3503.5 states that it is "unlawful to take, possess, or destroy the nest or eggs of any such bird except otherwise provided by this code or any regulation adopted pursuant thereto." In addition, fully protected species under the Fish and Game Code Section 3511 (birds), Section 4700 (mammals), Section 5515 (fish), and Section 5050 (reptiles and amphibians) are also considered special-status animal species. Species with no formal special-status designation but thought by experts to be rare or in serious decline may also be considered special-status animal species in some cases, depending on project-specific analysis and relevant, localized conservation needs or precedence.

2.3 Sensitive Habitats

Sensitive habitats include riparian corridors, wetlands, habitats for legally protected species, areas of high biological diversity, areas supporting rare or special-status wildlife habitat, and unusual or regionally restricted vegetation types. Vegetation types considered sensitive include those listed on CDFW's *California Natural Communities List* (i.e., those habitats that are rare or endangered within the borders of California) (CDFW, 2023), those that are occupied by species listed under the ESA or are critical habitat in accordance with the ESA, and those that are defined as Environmentally Sensitive Habitat Areas under the California Coastal Act. Specific habitats may also be identified as sensitive in city or county general plans or ordinances. Sensitive habitats are regulated under federal regulations (such as the Clean Water Act and Executive Order 11990 – Protection of Wetlands), state regulations (such as CEQA and the CDFW Streambed Alteration Program), or local ordinances or policies (such as city or county tree ordinances and general plan policies).

2.4 Data Sources

The primary literature and data sources reviewed in order to determine the occurrence or potential for occurrence of special-status species within the survey area are as follows:

- Current agency status information from the Service and CDFW for species listed, proposed for listing, or candidates for listing as threatened or endangered under the ESA or CESA, and those considered CDFW "species of special concern", including:
    - CNDDB occurrences reports from the Greenfield quadrangle and the eight surrounding quadrangles, including Soledad, North Chalone Peak, Topo Valley, Paraiso Springs, Pinalito Canyon, Reliz Canyon, Thompson Canyon, and San Lucas (CDFW, 2023; **Appendix A**); and
    - Service IPaC Resource List (Service, 2023a; **Appendix B**).
- The CNPS *Inventory of Rare and Endangered Vascular Plants of California* (CNPS, 2023);
- The U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey (USDA-NRCS, 2023); and
- The National Wetlands Inventory Wetlands Mapper (Service, 2023b).

From these resources, a list of special-status plant and wildlife species known or with the potential to occur within or adjacent to the survey area was created (**Appendix C**). This list presents these species along with their legal status, habitat requirements, and a brief statement of the likelihood to occur.

2.4.1 Botany

Vegetation types identified in *A Manual of California Vegetation* (Sawyer et al., 2009) were utilized to determine if vegetation types identified as sensitive on CDFW's *California Natural Communities List* (CDFW, 2023) are present within the project parcel. Information regarding the distribution and habitats of local and state vascular plants was also reviewed (Howitt and Howell, 1964 and 1973; Munz and Keck, 1973; Baldwin et al., 2012; Matthews and Mitchell, 2015; Jepson Flora Project, 2023). All plants observed within the survey area during the evaluation were identified to species or intraspecific taxon necessary to eliminate them as being special-status species using keys and descriptions in *The Jepson Manual: Vascular Plants of California, Edition 2* (Baldwin et al., 2012) and *The Plants of Monterey County an Illustrated Field Key* (Matthews and Mitchell, 2015). Scientific nomenclature for plant species identified within this document follows Baldwin, et. al, (2012); common names follow Matthews and Mitchell (2015). A full botanical inventory was recorded for the survey area and the dominant species within each habitat were noted. Dominant plant species are those which are more numerous than their competitors in an ecological community or make up more of the biomass; generally, the species that are most abundant. Most ecological communities are defined by their dominant species.

The California Invasive Plant Council (Cal-IPC) Inventory (Cal-IPC, 2023) was reviewed to determine if any invasive plant species are present within the project parcel.

2.4.2 Wildlife

The following literature and data sources were reviewed: CDFW reports on special-status wildlife (Remsen, 1978; Williams, 1986; Jennings and Hayes, 1994; Thelander, 1994; Thomson et. al, 2016); California Wildlife Habitat Relationships Program species-habitat models (Zeiner et al., 1988 and 1990); and general wildlife references (Stebbins, 1972, 1985, and 2003).

2.5 Regulatory Setting

The following regulatory discussion describes the laws and ordinances that may be applicable to the project.

2.5.1 Federal Regulations

Federal Endangered Species Act

Provisions of the ESA of 1973 (16 USC 1532 et seq., as amended) protect federally listed threatened or endangered species and their habitats from unlawful take. Listed species include those for which proposed and final rules have been published in the Federal Register. The ESA is administered by the Service or National Oceanic and Atmospheric Administration Marine Fisheries Service (NMFS). In general, the NMFS is responsible for the protection of ESA-listed marine species and anadromous fish, whereas other listed species are under Service jurisdiction.

Section 9 of ESA prohibits the take of any fish or wildlife species listed under ESA as endangered or threatened. Take, as defined by ESA, is "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." Harm is defined as "any act that kills or injures the fish or wildlife…including significant habitat modification or degradation that significantly impairs essential behavioral patterns of fish or wildlife." In addition, Section 9 prohibits removing, digging up, and maliciously damaging or destroying federally listed plants on sites under federal jurisdiction. Section 9 does not prohibit take of federally listed plants on sites not under federal jurisdiction. If there is the potential for incidental take of a federally listed fish or wildlife species, take of listed species can be authorized through either the Section 7 consultation process for federal actions or a Section 10 incidental take permit process for non-federal actions. Federal agency actions include activities that are on federal land, conducted by a federal agency, funded by a federal agency, or authorized by a federal agency (including issuance of federal permits).

Clean Water Act

The U.S. Army Corps of Engineers (ACOE) and U.S. Environmental Protection Agency (EPA) regulate discharge of dredged and fill material into waters of the U.S. under Section 404 of the CWA. Waters of the U.S. are defined broadly as waters susceptible to use in commerce (including waters subject to tides, interstate waters, and interstate wetlands) and other waters (such as interstate lakes, rivers, streams, mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds) (33 CFR 328.3). Potential wetland areas are identified 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 soils conditions."

Under Section 401 of the CWA, any applicant receiving a Section 404 permit from the USACE must also obtain a Section 401 Water Quality Certification from the Regional Water Quality Control Board (RWQCB). A Section 401 Water Quality Certification is issued when a project is demonstrated to comply with state water quality standards and other aquatic resource protection requirements.

2.5.2 State Regulations

California Endangered Species Act

The CESA was enacted in 1984. The California Code of Regulations (Title 14, §670.5) lists animal species considered endangered or threatened by the state. Section 2090 of CESA requires state agencies to comply with endangered species protection and recovery and to promote conservation of these species. Section 2080 of the Fish and Game Code prohibits "take" of any species that the commission determines to be an endangered species or a threatened species. "Take" is defined in Section 86 of the Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." A Section 2081 Incidental Take Permit from the CDFW may be obtained to authorize "take" of any state listed species.

California Native Plant Protection Act

The CNPPA of 1977 directed CDFW to carry out the legislature's intent to "preserve, protect and enhance rare and Endangered plants in the State." The CNPPA prohibits importing rare and Endangered plants into California, taking rare and Endangered plants, and selling rare and Endangered plants. The CESA and CNPPA authorized the Fish and Game Commission to designate endangered, threatened, and rare species and to regulate the taking of these species (§2050-2098, Fish and Game Code). Plants listed as rare under the CNPPA are not protected under CESA; however, these plants may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research.

California Fish and Game Code

Birds. Section 3503 of the Fish and Game Code states that it is "unlawful to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto." Section 3503.5 prohibits the killing, possession, or destruction of any birds in the orders Falconiformes or Strigiformes (birds-of-prey). Section 3511 prohibits take or possession of fully protected birds. Section 3513 prohibits the take or possession of any migratory nongame birds designated under the federal Migratory Bird Treaty Act (MBTA). Section 3800 prohibits take of nongame birds.

Species of Special Concern. As noted above, the CDFW also maintains a list of wildlife "species of special concern." Although these species have no legal status, the CDFW recommends considering these species during analysis of project impacts to protect declining populations and avoid the need to list them as endangered in the future.

Native Plant Protection Act

The CNPPA of 1977 directed the CDFW to carry out the legislature's intent to "preserve, protect and enhance rare and endangered plants in the state." The CNPPA prohibits importing rare and endangered plants into California, taking rare and endangered plants, and selling rare and endangered plants. The CESA and CNPPA authorized the Fish and Game Commission to designate endangered, threatened and rare species and to regulate the taking of these species (§2050-2098, Fish and Game Code). Plants listed as rare under the CNPPA are not protected under CESA.

2.5.3 Local Regulations

Monterey County Code

Section 16.16.050 (K) of the Monterey County Code identifies that the following standards of construction are required for areas within 200 feet of a river or within 50 feet of a watercourse:

- *A setback of two hundred (200) feet from the top of the bank of a river and fifty (50) feet from the top of the bank of a watercourse will be established where encroachment will be prohibited unless it can be proven to the satisfaction of the Monterey County Water Resources Agency that:*
    1. *The proposed development will not significantly reduce the capacity of existing rivers or watercourses or otherwise adversely affect any other properties by increasing stream velocities or depths, or diverting the flow; and*
    2. *The proposed new development will be safe from flow related erosion and will not cause flow related erosion hazards or otherwise aggravate flow related erosion hazards.*

3.0 RESULTS

The vegetation consists of three vegetation types, active agriculture, ruderal/disturbed, and scrub. In addition, approximately 3.6 acres of the survey area are developed, and therefore contain no vegetation or limited landscape/horticulture species that provide no habitat for wildlife. Developed areas also include paved roadways and single-family residences. The habitat classifications within the survey area are described below.

3.1 Habitat Classification

3.1.1 Active Agriculture

- *A Manual of California Vegetation* classification(s): None
- CDFW *California Natural Communities List*: Not listed

A portion of the survey area is dominated by active agriculture, specifically row cropping or sod farming. Agricultural areas have low biological value due to the constant disturbance regime associated with agricultural activities. Approximately 72.7 acres of active agriculture occurs within the survey area (**Figure 4**).

3.1.2 Ruderal/Disturbed

- *A Manual of California Vegetation* classification(s): None
- CDFW *California Natural Communities List*: Not listed

Ruderal/disturbed areas are those areas which have been developed or have been subject to historic and ongoing disturbance by human activities and are devoid of vegetation or dominated by non-native and/or invasive weed species. The survey area primarily consists of ruderal/disturbed areas consisting of waste water treatment facilities described in *Section 1.1*, agricultural roads, and staging areas. Dominant plant species along the edges of the agriculture roads and wastewater treatment facilities include sow thistle (*Silybum marianum*), wild mustard (*Brassica* sp.), cheeseweed (*Malva parviflora*), long-beaked filaree (*Erodium botrys*), red-stemmed filaree (*Erodium cicutarium*), horseweed (*Erigeron canadensis*), poison hemlock (*Conium maculatum*), sweet clover (*Melilotus* sp.*)*, and annual non-native grasses. There were few blue gum eucalyptus (*Eucalyptus globulus)* and Peruvian pepper trees (*Schinus molle*) present along the margins of the agricultural roads. Approximately 62.2 acres of ruderal habitat consisting of dirt roads, the pond complex and surrounding facilities, and the existing WWTP, is present within the survey area (**Figure 4**).

Ruderal areas are considered to have low biological value as they are generally dominated by non-native plant species and consists of relatively low-quality habitat from a wildlife perspective. However, common wildlife species which do well in urbanized and disturbed areas, such as the American crow (*Corvus brachyrhynchos*), California ground squirrel (*Otospermophilus beecheyi*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), western scrub jay (*Aphelocoma californica*), European starling (*Sturnus vulgaris*), western fence lizard (*Sceloporus occidentalis*), and rock pigeon (*Columba livia*), may forage in ruderal habitat within the survey area.

3.1.3 Scrub

- *A Manual of California Vegetation* classification(s): Coyote brush scrub (*Baccharis pilularis* shrubland alliance)
- CDFW *California Natural Communities List*: Not Sensitive

The structure of plant associations that comprise scrub habitat typically consist of low to moderate-sized shrubs with sclerophyllous leaves, flexible branches, semi-woody stems growing from a woody base, and a shallow root system. Scrub vegetation is present along the northern boundary of the survey area as the survey area nears the Salinas River floodplain. The dominant plant species within the scrub habitat include coyote brush (*Baccharis pilularis*), wild mustard (*Brassica* sp.), and English ivy (*Hedera helix*) as well as non-native annual grasses including slender wild oat (*Avena barbata*) and rip-gut brome (*Bromus diandrus*). Non dominant plant species include arroyo willow trees (*Salix lasiolepis*), narrow leaf willow (*Salix exigua*), blue elder (*Sambucus cerulea*), and California poppies (*Eschscholzia californica*). Approximately 2.2 acres of scrub habitat is present within the survey area (**Figure 4**).

Though vegetative productivity is low in scrub habitat, scrub habitat appears to support several of vertebrate species (Stebbins, 1978). Common wildlife observed within scrub habitat include scrub jay, chestnut-backed chickadee (*Poecile rufescens*), western fence lizard, and brush rabbit (*Sylvilagus bachmani*). Scrub habitat within the survey area may provide habitat for San Joaquin whipsnake, and nesting habitat for white-tailed kite.

Greenfield Wastewater Treatment Plant Improvement Project - Habitat Classification Map

Date
11/29/2023

Scale
1 in = 703 ft

DENISE DUFFY & ASSOCIATES, INC.
Planning and Environmental Consulting

Figure
4

Path: F:\GIS\GIS_Projects\2022-71 Greenfield Wastewater Treatment Plant Improvement Project\Greenfield_WastewaterImprovemnt\Greenfield_WastewaterImprovemnt.aprx

3.2 Sensitive Habitats

No sensitive habitats were identified within the survey area.

3.3 Special-Status Species

Published occurrence data within the project area and surrounding USGS quadrangles were evaluated to compile a table of special-status species known to occur in the vicinity of the survey area (see *Section 2.0 Methods*). Each of these species was evaluated for their likelihood to occur within and immediately adjacent to the survey area (**Appendix C**). No special-status plant species were observed or have the potential to occur within the project parcel. Two special-status wildlife species has been determined to have a moderate potential to occur within or immediately adjacent to the survey area. In addition, raptors and other protected avian species have the potential to nest within trees present within the project parcel. These species are discussed further below. All other species are assumed unlikely to occur or have a low potential to occur based on the species-specific reasons presented in **Appendix C**, are therefore unlikely to be impacted by the project, and are not discussed further.

3.3.1 Special-Status Wildlife Species

San Joaquin Whipsnake
The San Joaquin whipsnake is a CDFW species of special concern. Whipsnakes seek cover in rodent burrows, bushes, trees, and rock piles. This species hibernates in soil or sand approximately 0.3 meter (1 foot) below the surface, sometimes at the bases of plants. Little is known about nest sites. In desert regions, whipsnakes may be attracted to water to drink or ambush prey. Open terrestrial habitats are preferred, but whipsnakes will occasionally climb trees and bushes to bask, seek prey, or take cover. Diet consists of rodents, lizards and their eggs, snakes (including rattlesnakes), birds and their eggs, young turtles, insects, and carrion. Whipsnakes, a diurnal species, search actively for prey, with their heads elevated. This species inserts its head in burrows or climbs trees, using both vision and olfaction to detect prey (Stebbins 1985). Mating occurs in April and May, eggs are laid in June and July, and the first young appear in late August to early September.

The CNDDB reports 3 occurrences of San Joaquin whipsnake within the quadrangles evaluated. The nearest occurrence is 4.3 miles from the survey area from 1987. Habitat quality for San Joaquin whipsnake within the survey area is relatively low. The majority of the site is ruderal, agriculture, or developed habitat that does not provide appropriate cover or habitat conditions for San Joaquin whipsnake. However, the 2.2 acres of open scrub habitat within the survey area may provide suitable habitat for San Joaquin whipsnake.

White-Tailed Kite
The white-tailed kite is a California fully protected species and is protected by the MBTA. This raptor species is a common to uncommon, year-long resident in coastal and valley lowlands. White-tailed kite generally utilizes herbaceous lowlands with variable tree growth and an associated high population density of voles (*Microtus californicus*). Nests are made of loosely piled sticks and twigs and lined with grass, straw, or rootlets. Nests are generally placed near the top of dense oak (*Quercus* sp.), willow, or other tree stands (usually 6-20 meters [20-100 feet] above ground) and are often located near an open foraging area. Breeding occurs from February to October with peak activity occurring from May to August. This species

preys predominantly on voles and other small mammals, but also takes birds, insects, reptiles, and amphibians. Foraging occurs in undisturbed open grasslands, meadows, farmlands, and emergent wetlands.

The survey area is within the known breeding range of the white-tailed kite and the CNDDB reports 4 occurrences of the white-tailed kite within the quadrangles reviewed. The nearest CNDDB occurrence is located approximately 1.9 miles from the survey area from 2007 and consists of the whole North Chalone Peak quadrangle. This species was not observed during the May 2023 reconnaissance-level survey, but the survey area provides suitable open scrub and agricultural habitat for foraging and potential nest sites in shrubs and trees. Therefore, white-tailed kite has moderate potential to nest in the survey area.

Protected Avian Species

Raptors and other nesting birds are protected under the California Fish and Game Code. While the life histories of these species vary, overlapping nesting and foraging similarities allow for their concurrent discussion. Most raptors are breeding residents throughout most of the wooded portions of the state. Stands of live oak, riparian deciduous, or other forest habitats, as well as open grasslands, are used most frequently for nesting. Smaller avian species may also nest in scrub habitats and urban areas. Breeding occurs February through September, with peak activity May through July. Various avian species, such as California scrub jay (*Aphelocoma californica*), dark-eyed junco (*Junco hyemalis*), mourning dove (*Zenaida macroura*), and sparrows (*Zonotrichia* sp.), have a potential to nest within the trees present within the survey area.

4.0 IMPACTS AND MITIGATION MEASURES

The following section describes potential impacts that may result from the project. For the purposes of this analysis, an impact is significant and requires mitigation if it would result in any of the following:

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 CDFW or the Service;
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by CDFW or the 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 nursery sites;
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
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.

Criterions “b” and “c” were not evaluated for impacts to sensitive habitats or state or federally protected wetlands, as none are present within the survey area. Criterion “e” was not evaluated for conflicts with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance because the project will not require tree removal. Criterion “f” was not evaluated for conflicts with an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan because the survey area is not located within any such plan area.

Impact BIO-1: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or the Service.

San Joaquin whipsnake have the potential to occur in the scrub habitat located on the northern boundary of the survey area. Construction activities associated with the conversion of Ponds #1 and #2 to recycled water storage basins, including excavation and grading could result in direct mortality of this species if they were to disperse from the adjacent scrub habitat. This would be a potentially significant impact that can be reduced to a less-than-significant level with implementation of Mitigation Measures BIO-1 and BIO-2.

Raptors and other protected avian species, including the white-tailed kite, have the potential to occur within the survey area. Construction activities, including vegetation removal and excavation, during the breeding and nesting seasons could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment within the survey area. This would be a potentially significant impact that can be reduced to a less-than-significant level with implementation of Mitigation Measures BIO-1 and BIO-3.

Mitigation Measure BIO-1: Prior to construction activities, the project proponent shall retain a qualified biologist to conduct an Employee Education Program for the construction crew. The biologist shall meet with the construction crew at the survey area at the onset of construction to educate the construction crew on the following: a) a review of the project boundaries; b) all special-status species that may be present, their habitat, and proper identification; c) the specific mitigation measures that will be incorporated into the construction effort; d) the general provisions and protections afforded by the regulatory agencies; and e) the proper procedures if a special-status animal is encountered within the survey area.

Mitigation Measure BIO-2: Prior to ground disturbing activities in the Pond Area adjacent to scrub habitat, a qualified biologist will conduct a clearance survey in suitable habitat within the survey area for San Joaquin whipsnake. If San Joaquin whipsnake is observed during construction, measures will be taken to avoid the individual(s) and the species will be allowed to leave on its own volition or will be relocated outside of the survey area by the qualified biologist.

Mitigation Measure BIO-3: Construction activities that may directly (e.g., vegetation removal) or indirectly affect (e.g., noise/ground disturbance) nesting raptors and other protected avian species shall be timed to avoid the breeding and nesting seasons (February 1 through September 15).

If construction activities must occur during the breeding and nesting season (February 1 through September 15), a qualified biologist shall conduct pre-construction surveys for nesting raptors and other protected avian species within 300 feet of the proposed construction activities. Pre-construction surveys should be conducted no more than 7 days prior to the start of the construction activities during the early part of the breeding season (February through April) and no more than 14 days prior to the initiation of these activities during the late part of the breeding season (May through August).

If raptors or other protected avian nests are identified during the pre-construction surveys, the qualified biologist would notify the project proponent and an appropriate no-disturbance buffer would be imposed within which no construction activities or disturbance would take place (generally 300 feet in all directions for raptors; other avian species may have species-specific requirements) until the young of the year have fledged and are no longer reliant upon the nest or parental care for survival, as determined by a qualified biologist.

Impact BIO-2: 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 nursery sites.

The project would result in minor improvements in existing disturbed areas which are consistent with existing improvements. In addition, the survey area would not require the development of additional roads or structures for access that would disconnect, fragment, or otherwise impede wildlife movement in the area. Therefore, this impact is less than significant, and no mitigation is required.

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APPENDIX A

California Natural Diversity Database Report

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Soledad (3612143) OR North Chalone Peak (3612142) OR Topo Valley (3612141) OR Paraiso Springs (3612133) OR Greenfield (3612132) OR Pinalito Canyon (3612131) OR Reliz Canyon (3612123) OR Thompson Canyon (3612122) OR San Lucas (3612121))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Accipiter cooperii Cooper's hawk	ABNKC12040	None	None	G5	S4	WL
Accipiter striatus sharp-shinned hawk	ABNKC12020	None	None	G5	S4	WL
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	Threatened	G1G2	S1S2	SSC
Ambystoma californiense pop. 1 California tiger salamander - central California DPS	AAAAA01181	Threatened	Threatened	G2G3T3	S3	WL
Anniella pulchra Northern California legless lizard	ARACC01020	None	None	G3	S2S3	SSC
Antrozous pallidus pallid bat	AMACC10010	None	None	G4	S3	SSC
Aquila chrysaetos golden eagle	ABNKC22010	None	None	G5	S3	FP
Ardea herodias great blue heron	ABNGA04010	None	None	G5	S4	
Asio otus long-eared owl	ABNSB13010	None	None	G5	S3?	SSC
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S3	SSC
Bombus caliginosus obscure bumble bee	IIHYM24380	None	None	G2G3	S1S2	
Bombus crotchii Crotch bumble bee	IIHYM24480	None	Candidate Endangered	G2	S2	
Bombus occidentalis western bumble bee	IIHYM24252	None	Candidate Endangered	G3	S1	
Branchinecta lynchi vernal pool fairy shrimp	ICBRA03030	Threatened	None	G3	S3	
Caulanthus lemmonii Lemmon's jewelflower	PDBRA0M0E0	None	None	G3	S3	1B.2
Centromadia parryi ssp. congdonii Congdon's tarplant	PDAST4R0P1	None	None	G3T2	S2	1B.1
Chorizanthe biloba var. immemora Hernandez spineflower	PDPGN04025	None	None	G3T1T2	S1S2	1B.2
Chorizanthe pungens var. pungens Monterey spineflower	PDPGN040M2	Threatened	None	G2T2	S2	1B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Clarkia jolonensis Jolon clarkia	PDONA050L0	None	None	G2	S2	1B.2
Collinsia multicolor San Francisco collinsia	PDSCR0H0B0	None	None	G2	S2	1B.2
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	None	G4	S2	SSC
Delphinium californicum ssp. interius Hospital Canyon larkspur	PDRAN0B0A2	None	None	G3T3	S3	1B.2
Delphinium recurvatum recurved larkspur	PDRAN0B1J0	None	None	G2?	S2?	1B.2
Delphinium umbraculorum umbrella larkspur	PDRAN0B1W0	None	None	G3	S3	1B.3
Dipodomys venustus elephantinus big-eared kangaroo rat	AMAFD03041	None	None	G4T2	S3	
Elanus leucurus white-tailed kite	ABNKC06010	None	None	G5	S3S4	FP
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Eriogonum butterworthianum Butterworth's buckwheat	PDPGN080X0	None	Rare	G2	S2	1B.3
Eriogonum heermannii var. occidentale western Heermann's buckwheat	PDPGN082P6	None	None	G5T2	S2	1B.2
Eriogonum nortonii Pinnacles buckwheat	PDPGN08470	None	None	G2	S2	1B.3
Eumops perotis californicus western mastiff bat	AMACD02011	None	None	G4G5T4	S3S4	SSC
Falco mexicanus prairie falcon	ABNKD06090	None	None	G5	S4	WL
Falco peregrinus anatum American peregrine falcon	ABNKD06071	Delisted	Delisted	G4T4	S3S4	FP
Gymnogyps californianus California condor	ABNKA03010	Endangered	Endangered	G1	S1	FP
Idiostatus kathleenae Pinnacles shieldback katydid	IIORT31020	None	None	G1G2	S1S2	
Lagophylla diabolensis Diablo Range hare-leaf	PDAST5J060	None	None	G2	S2	1B.2
Lasiurus cinereus hoary bat	AMACC05032	None	None	G3G4	S4	
Lasiurus frantzii western red bat	AMACC05080	None	None	G4	S3	SSC
Lavinia exilicauda harengus Monterey hitch	AFCJB19013	None	None	G4T3	S3	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Layia heterotricha pale-yellow layia	PDAST5N070	None	None	G2	S2	1B.1
Malacothamnus aboriginum Indian Valley bush-mallow	PDMAL0Q020	None	None	G3	S3	1B.2
Malacothamnus davidsonii Davidson's bush-mallow	PDMAL0Q040	None	None	G2	S2	1B.2
Masticophis flagellum ruddocki San Joaquin coachwhip	ARADB21021	None	None	G5T2T3	S3	SSC
Myotis ciliolabrum western small-footed myotis	AMACC01230	None	None	G5	S3	
Myotis evotis long-eared myotis	AMACC01070	None	None	G5	S3	
Myotis thysanodes fringed myotis	AMACC01090	None	None	G4	S3	
Myotis yumanensis Yuma myotis	AMACC01020	None	None	G5	S4	
North Central Coast Drainage Sacramento Sucker/Roach River North Central Coast Drainage Sacramento Sucker/Roach River	CARA2623CA	None	None	GNR	SNR	
Oncorhynchus mykiss irideus pop. 9 steelhead - south-central California coast DPS	AFCHA0209H	Threatened	None	G5T2Q	S2	
Optioservus canus Pinnacles optioservus riffle beetle	IICOL5E020	None	None	G2	S1	
Perognathus inornatus psammophilus Salinas pocket mouse	AMAFD01062	None	None	G2G3T2?	S1	SSC
Phrynosoma blainvillii coast horned lizard	ARACF12100	None	None	G3G4	S4	SSC
Plagiobothrys uncinatus hooked popcornflower	PDBOR0V170	None	None	G2	S2	1B.2
Rana boylii pop. 4 foothill yellow-legged frog - central coast DPS	AAABH01054	Proposed Threatened	Endangered	G3T2	S2	
Rana boylii pop. 6 foothill yellow-legged frog - south coast DPS	AAABH01056	Proposed Endangered	Endangered	G3T1	S1	
Rana draytonii California red-legged frog	AAABH01022	Threatened	None	G2G3	S2S3	SSC
Riparia riparia bank swallow	ABPAU08010	None	Threatened	G5	S2	
Senecio aphanactis chaparral ragwort	PDAST8H060	None	None	G3	S2	2B.2
Sidalcea hickmanii ssp. hickmanii Hickman's checkerbloom	PDMAL110A2	None	None	G3T2	S2	1B.3
Spea hammondii western spadefoot	AAABF02020	None	None	G2G3	S3S4	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Taricha torosa Coast Range newt	AAAAF02032	None	None	G4	S4	SSC
Taxidea taxus American badger	AMAJF04010	None	None	G5	S3	SSC
Texosporium sancti-jacobi woven-spored lichen	NLTEST7980	None	None	G3	S2	3
Valley Oak Woodland Valley Oak Woodland	CTT71130CA	None	None	G3	S2.1	
Vireo bellii pusillus least Bell's vireo	ABPBW01114	Endangered	Endangered	G5T2	S2	
Vulpes macrotis mutica San Joaquin kit fox	AMAJA03041	Endangered	Threatened	G4T2	S2	

Record Count: 66

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APPENDIX B

IPaC Resource List

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

Monterey County, California

Local office

Ventura Fish And Wildlife Office

☎ (805) 644-1766
📠 (805) 644-3958

✉ FW8VenturaSection7@FWS.Gov

2493 Portola Road, Suite B
Ventura, CA 93003-7726

https://www.fws.gov/Ventura

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
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

Birds

NAME	STATUS
California Condor Gymnogyps californianus There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/8193	Endangered
Least Bell's Vireo Vireo bellii pusillus Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/5945	Endangered
Southwestern Willow Flycatcher Empidonax traillii extimus Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/6749	Endangered
Yellow-billed Cuckoo Coccyzus americanus There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/3911	Threatened

Amphibians

NAME	STATUS

California Red-legged Frog Rana draytonii Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/2891	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. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/498	Threatened

Flowering Plants

NAME	STATUS
Marsh Sandwort Arenaria paludicola Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2229	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.

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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
Allen's Hummingbird Selasphorus sasin This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9637	Breeds Feb 1 to Jul 15

Bald Eagle Haliaeetus leucocephalus — Breeds Jan 1 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

Bullock's Oriole Icterus bullockii — Breeds Mar 21 to Jul 25

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

California Thrasher Toxostoma redivivum — Breeds Jan 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Common Yellowthroat Geothlypis trichas sinuosa — Breeds May 20 to Jul 31

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/2084

Golden Eagle Aquila chrysaetos — Breeds Jan 1 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1680

Lawrence's Goldfinch Carduelis lawrencei — Breeds Mar 20 to Sep 20

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9464

Nuttall's Woodpecker Picoides nuttallii — Breeds Apr 1 to Jul 20

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/9410

Oak Titmouse Baeolophus inornatus — Breeds Mar 15 to Jul 15

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9656

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
Wrentit *Chamaea fasciata* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 10
Yellow-billed Magpie *Pica nuttalli* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9726	Breeds Apr 1 to Jul 31

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.

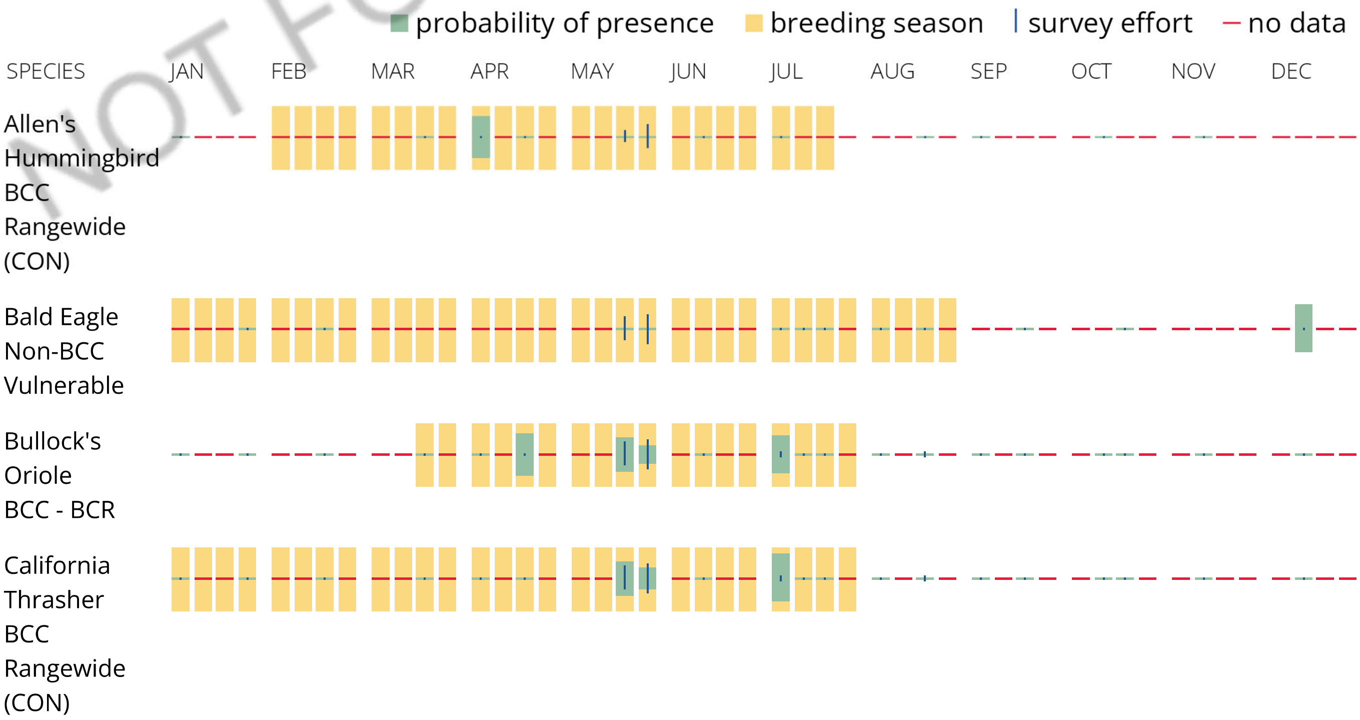
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

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.



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 list of migratory birds that potentially occur 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 Rapid Avian Information Locator (RAIL) 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 or migrating in my 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 query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. 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.

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 (NWI)

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.

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

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.

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APPENDIX C

Special-Status Species Table

Special-Status Species Table

Soledad, North Chalone Peak, Topo Valley, Paraiso Springs, Greenfield, Pinalito Canyon, Reliz Canyon, Thompson Canyon, San Lucas Quadrangles

Species	Status (Service/CDFW/CNPS)	General Habitat	Potential Occurrence within Project Site
MAMMALS			
Antrozous pallidus Pallid bat	-- / CSC / --	Occurs in a wide variety of habitats including grasslands, shrublands, arid desert areas, oak savanna, coastal forested areas, and coniferous forests of the mountain regions of California. Most common in open, dry habitats with rocky areas for roosting. Day roosts include caves, crevices, mines, and occasionally hollow trees and buildings. Seems to prefer rocky outcrops, cliffs, and crevices with access to open habitats for foraging. Similar structures are used for night roosting and will also use more open sites such as eaves, awnings, and open areas under bridges for feeding roosts.	**Low** May forage in scrub or agricultural habitat within or adjacent to the survey area. No suitable roosting habitat is present within the survey area.
Corynorhinus townsendii Townsend's big-eared bat	-- / CSC / --	Found primarily in rural settings from inland deserts to coastal redwoods, oak woodland of the inner Coast Ranges and Sierra foothills, and low to mid-elevation mixed coniferous-deciduous forests. Typically roost during the day in limestone caves, lava tubes, and mines, but can roost in buildings that offer suitable conditions. Night roosts are in more open settings and include bridges, rock crevices, and trees.	**Low** May forage in scrub or agricultural habitat within or adjacent to the survey area. No suitable roosting habitat is present within the survey area. The nearest CNDDB occurrence is one mile from the survey area from 1940.
Eumops perotis californicus Western mastiff bat	-- / CSC / --	Many open habitats including conifer and deciduous woodlands, coastal scrub, grassland, and chaparral. Roost in crevices in cliff faces, high buildings, trees, and tunnels.	**Low** May forage in scrub or agricultural habitat within or adjacent to the survey area. No suitable roosting habitat is present within the survey area.
Lasiurus frantzii Western red bat	-- / CSC / --	Roosting habitat includes trees and sometimes shrubs in forests and woodlands from sea level up through mixed conifer forests. Roost sites are often in edge habitats adjacent to streams, fields, or urban areas. Feeds over a wide variety of habitats, including grasslands, shrublands, open woodlands and forests, and croplands.	**Low** May forage in scrub or agricultural habitat within or adjacent to the survey area. No suitable roosting habitat is present within the survey area.
Perognathus inornatus psammophilus Salinas pocket mouse	-- / CSC / --	Typically found in grasslands and blue oak savanna, needs friable soils.	**Low** Marginal habitat is present adjacent to the survey area. The nearest CNDDB occurrence is 6 miles away from the survey area from 1936.

Species	Status (Service/CDFW/CNPS)	General Habitat	Potential Occurrence within Project Site
Taxidea taxus American badger	-- / CSC / --	Dry, open grasslands, fields, pastures savannas, and mountain meadows near timberline are preferred. The principal requirements seem to be sufficient food, friable soils, and relatively open, uncultivated grounds.	**Unlikely** No suitable habitat is present within the survey area.
Vulpes macrotis mutica San Joaquin Kit fox	FE / ST / --	Open, level areas with loose-textured soils supporting scattered, shrubby vegetation with little human disturbance. Live in annual grasslands or grassy open stages dominated by scattered brush, shrubs, and scrub.	**Low** Marginal habitat is present within upper floodplain areas of the Salinas River with loose soils and scattered shrubby vegetation. The most recent CNDDB occurrences within five kilometers of the survey area are from 1975.
BIRDS			
Agelaius tricolor Tricolored blackbird (nesting colony)	-- / SC&CSC / --	Nest in colonies in dense riparian vegetation, along rivers, lagoons, lakes, and ponds. Forages over grassland or aquatic habitats.	**Low** Moderate nesting potential is present within riparian scrub habitat along the Salinas River floodplain over 1,000 feet north of the survey area. May forage in open scrub areas within the survey area.
Aquila chrysaetos Golden eagle (nesting & wintering)	--/ CFP / --	Use rolling foothills, mountain terrain, wide arid plateaus deeply cut by streams and canyons, open mountain slopes, cliffs, and rocky outcrops. Nests in secluded cliffs with overhanging ledges as well as large trees.	**Unlikely** No suitable nesting habitat is present within the survey area.
Asio otus Long-eared owl (nesting)	-- / CSC / --	Frequents dense, riparian and live oak thickets near meadow edges, and nearby woodland and forest habitats. Also found in dense conifer stands at higher elevations.	**Low** Marginal nesting potential is present within open riparian scrub habitat along the Salinas River floodplain adjacent to the survey area.
Athene cunicularia Burrowing owl (burrow sites & some wintering sites)	-- / CSC / --	Year-round resident of open, dry grassland and desert habitats, and in grass, forb and open shrub stages of pinyon-juniper and ponderosa pine habitats. Frequent open grasslands and shrublands with perches and burrows. Use rodent burrows (often California ground squirrel) for roosting and nesting cover. Pipes, culverts, and nest boxes may be substituted for burrows in areas where burrows are not available.	**Low** Marginal habitat is present adjacent to the agricultural habitat in the dry grassland areas outside of the survey area. The nearest CNDDB occurrence is approximately 9 miles from the survey area from 2007.
Coccyzus americanus occidentalis Western yellow-billed cuckoo	FT / SE / --	Inhabits extensive deciduous riparian thickets or forests with dense, low-level or understory foliage, slow-moving watercourses, backwaters, or seeps. Willow almost always a dominant component of the vegetation.	**Low** Only marginal habitat is present. The sparse shrubby vegetation near the Salinas River within and adjacent to the survey area lacks the structure required by this species. The nearest CNDDB occurrence is approximately 40 kilometers away from the survey area and is an occurrence from 1899 listed as extirpated.

Species	Status (Service/CDFW/CNPS)	General Habitat	Potential Occurrence within Project Site
Elanus leucurus White-tailed kite (nesting)	-- / CFP / --	Open groves, river valleys, marshes, and grasslands. Prefer areas with low roosts (fences etc.) available. Nest in shrubs and trees adjacent to grasslands.	**Moderate** Suitable nesting opportunities occur in the scrub habitat within the survey area near the Salinas River floodplain.
Empidonax traillii extimus Southwestern willow flycatcher (nesting)	FE / SE / --	Breeds in riparian habitat in areas ranging in elevation from sea level to over 2,600 meters. Builds nests in trees in densely vegetated areas. This species establishes nesting territories and builds and forages in mosaics of relatively dense and expansive areas of trees and shrubs, near or adjacent to surface water or underlain by saturated soils. Not typically found nesting in areas without willows (*Salix sp*.), tamarisk (*Tamarix ramosissima)*, or both.	**Low** Only marginal habitat is present in the Salinas River floodplain area. Riparian vegetation is sparse scrub and lacks the structure and density required by the species. Project site is outside of current range of the species. The nearest CNDDB occurrence is a 1995 record located approximately 210 kilometers south of the project site in Santa Barbara County.
Falco peregrinus anatum American peregrine falcon (nesting)	-- / CFP / --	Forages for other birds over a variety of habitats. Breeds primarily on rocky cliffs.	**Unlikely** No suitable nesting habitat is present within the survey area.
Gymnogyps californianus California condor	FE / SE / --	Roosting sites in isolated rocky cliffs, rugged chaparral, and pine covered mountains 2000-6000 feet above sea level. Foraging area removed from nesting/roosting site (includes rangeland and coastal area - up to 19 mile commute one way). Nest sites in cliffs, crevices, potholes.	**Unlikely** No suitable habitat is present within the survey area.
Riparia riparia Bank swallow (nesting)	-- / ST / --	Nest colonially in sand banks. Found near water; fields, marshes, streams, and lakes.	**Low** Suitable foraging and nesting habitat is not present within the survey area and is likely associated with the main channel and banks of the Salinas River. CNDDB reports an occurrence from 1972, presumably along the Salinas River. The survey area is within the current known species range.
Vireo bellii pusillus Least Bell's vireo	FE / SE / --	Riparian areas and drainages. Breed in willow riparian forest supporting a dense, shrubby understory. Oak woodland with a willow riparian understory is also used in some areas, and individuals sometimes enter adjacent chaparral, coastal sage scrub, or desert scrub habitats to forage.	**Low** Marginal habitat is present within the open scrub habitat in and adjacent to the survey area. The survey area is within the known species range, although the CNDDB does not list observations within 5 kilometers of the study area. The nearest CNDDB occurrence is a record from Pinnacles National Park in 1972, approximately 14.2 kilometers northeast of the survey area.

Species	Status (Service/CDFW/CNPS)	General Habitat	Potential Occurrence within Project Site
REPTILES AND AMPHIBIANS			
Ambystoma californiense California tiger salamander	FT / ST / --	Annual grassland and grassy understory of valley-foothill hardwood habitats in central and northern California. Need underground refuges and vernal pools or other seasonal water sources.	**Low** The survey area does not contain typical habitat requirements for CTS, which consists of seasonal ponds surrounded by grassland. Although these habitat conditions are present in the nearby Gabilan Range, the nearest CNDDB occurrence is located approximately 15 kilometers north of the survey area and agricultural activities within and immediately adjacent to the survey area preclude this species from using the uplands within the survey area. Therefore, the potential for CTS to be present is low.
Anniella pulchra Northern California legless lizard	-- / CSC / --	Requires moist, warm habitats with loose soil for burrowing and prostrate plant cover, often forages in leaf litter at plant bases; may be found on beaches, sandy washes, and in woodland, chaparral, and riparian areas.	**Low** Marginal habitat is present within the survey area in sandy floodplain soils where open scrub habitat is present. There are no CNDDB records within 5 km of the survey area.
Emys marmorata Western pond turtle	-- / CSC / --	Associated with permanent or nearly permanent water in a wide variety of habitats including streams, lakes, ponds, irrigation ditches, etc. Require basking sites such as partially submerged logs, rocks, mats of vegetation, or open banks.	**Unlikely** Marginal upland habitat is present along the Salinas River riparian corridor adjacent to the survey area. The nearest CNDDB occurrence along the Salinas River is an undated occurrence located approximately 17 kilometers south of the survey area at King City.
Masticophis flagellum ruddocki San Joaquin whipsnake	-- / CSC / --	Variety of habitats-deserts, scrub land, juniper-grassland, woodland, thorn forest, and farmland. Generally avoids dense vegetation. Ranges from Arbuckle in the Sacramento southward to the Grapevine in the Kern County portion of the San Joaquin Valley and westward into the inner South Coast Ranges. An isolated population also occurs in the Sutter Buttes.	**Moderate** Suitable habitat occurs within and adjacent to the survey area within open scrub near the Salinas River floodplain. The nearest CNDDB occurrence is from 1987 and is located approximately 4.3 miles west-southwest of the study area.
Phrynosoma blainvillii Coast horned lizard	-- / CSC / --	Associated with open patches of sandy soils in washes, chaparral, scrub, and grasslands.	**Low** Marginal habitat is present adjacent to the project site in open scrub areas with sandy soil near the Salina River floodplain. The nearest CNDDB occurrence is approximately 9 miles away from the project site from 2008.
Rana boylii Foothill yellow-legged frog	-- / SE / --	Partly-shaded, shallow streams and riffles with a rocky substrate in a variety of habitats, including hardwood, pine, and riparian forests, scrub, chaparral, and wet meadows. Rarely encountered far from permanent water.	**Unlikely** No suitable habitat is present within the survey area.

Species	Status (Service/CDFW/CNPS)	General Habitat	Potential Occurrence within Project Site
Rana draytonii California red-legged frog	FT / CSC / --	Lowlands and foothills in or near permanent or late-season sources of deep water with dense, shrubby, or emergent riparian vegetation. During late summer or fall adults are known to utilize a variety of upland habitats with leaf litter or mammal burrows.	**Low** No potential aquatic breeding habitat is present within or immediately adjacent to the survey area. Marginal dispersal habitat is present within undeveloped portions of the survey area, but the CNDDB does not list any occurrences within the known dispersal distance of the species; one mile (1.6 km). The nearest CNDDB occurrence is approximately 12.5 kilometers away. Therefore, the potential for CRLF to be present is low.
Spea hammondii Western spadefoot	-- / CSC / --	Grasslands with shallow temporary pools are optimal habitats for the western spadefoot. Occur primarily in grassland habitats, but can be found in valley and foothill woodlands. Vernal pools are essential for breeding and egg laying.	**Low** No suitable breeding habitat is present within the survey area. One historic CNDDB occurrence from 1943 is within the survey area with one mile accuracy. No vernal pools are present within the project site.
Taricha torosa Coast range newt	-- / CSC / --	Occurs mainly in valley-foothill hardwood, valley-foothill hardwood-conifer, coastal scrub, and mixed chaparral but is known to occur in grasslands and mixed conifer types. Seek cover under rocks and logs, in mammal burrows, rock fissures, or man-made structures such as wells. Breed in intermittent ponds, streams, lakes, and reservoirs.	**Unlikely** No suitable habitat is present within the survey area.
FISH			
Lavinia exilicauda harengus Monterey hitch (Pajaro/Salinas hitch)	-- / CSC / --	Found only within the Pajaro and Salinas River systems. Can occupy a wide variety of habitats, however, they are most abundant in lowland areas with large pools or small reservoirs that mimic such conditions. May be found in brackish water conditions within the Salinas River lagoon during the early summer months when the sandbar forms at the mouth of the river.	**Not Present** No suitable habitat is present within the survey area.
Oncorhynchus mykiss irideus Steelhead (south-central California coast DPS)	FT / -- / --	Cold headwaters, creeks, and small to large rivers and lakes; anadromous in coastal streams.	**Not Present** No suitable habitat is present within the survey area.

Species	Status (Service/CDFW/CNPS)	General Habitat	Potential Occurrence within Project Site
INVERTEBRATES			
Bombus crotchii Crotch bumble bee	-- / SC / --	Occurs in open grassland and scrub at relatively warm and dry sites. Requires plants that bloom and provide adequate nectar and pollen throughout the colony's life cycle, which is from early February to late October. Generally nests underground, often in abandoned mammal burrows. Within California this species is known to occur in the Mediterranean, Pacific Coast, Western Desert, as well as Great Valley and adjacent foothill regions.	**Low** Limited suitable habitat is present within the scrub habitat within and adjacent to the survey area. The nearest CNDDB occurrence is 7.2 miles from the project site from 1964.
Bombus occidentalis Western bumble bee	-- / SC / --	Occurs in open grassy areas, urban parks, urban gardens, chaparral, and meadows. This species generally nest underground. Western bumble bee populations are currently largely restricted to high elevation sites in the Sierra Nevada.	**Unlikely** Suitable habitat is present within the survey area however, the survey area is outside of the currently known range for this species. The nearest CNDDB occurrence is 2 miles from the project site from 1967.
Branchinecta lynchi Vernal pool fairy shrimp	FT / -- / --	Require ephemeral pools with no flow. Associated with vernal pool/grasslands from near Red Bluff (Shasta County), through the central valley, and into the South Coast Mountains Region. Require ephemeral pools with no flow.	**Not Present** No suitable habitat is present within the survey area.
Danaus plexippus Monarch butterfly	FC / -- / --	Overwinters in coastal California using colonial roosts generally found in Eucalyptus, pine and acacia trees. Overwintering habitat for this species within the Coastal Zone represents ESHA. Local ordinances often protect this species as well.	**Not Present** No suitable overwintering habitat is present within the survey area.
PLANTS			
Arenaria paludicola Marsh sandwort	FE / SE / 1B	Known from only two natural occurrences in Black Lake Canyon and at Oso Flaco Lake. Sandy openings of freshwater of brackish marshes and swamps at elevations of 3-170 meters. Stoloniferous perennial herb in the Caryophyllaceae family; blooms May-August.	**Not Present** No suitable habitat is present within the survey area. Not identified during the survey conducted in May 2023.
Caulanthus lemmonii Lemmon's jewel flower	-- / -- / 1B	Open, grassy areas on hillside slopes and in fields, canyons, and arroyos. Soils include alkaline soils, shaley clay, sandstone talus, and decomposed serpentine. Predominantly found within valley and foothill grassland and occasionally in pinyon and juniper woodland at elevations of 80 – 12,200 meters. Annual herb in the Brassicaceae family; blooms March-May.	**Not Present** Limited suitable habitat is present within the survey area. Not identified during the survey conducted in May 2023. The nearest CNDDB occurrence is 3 miles from the project site from 1986.

Species	Status (Service/CDFW/CNPS)	General Habitat	Potential Occurrence within Project Site
Centromadia parryi ssp. *congdonii* Congdon's tarplant	-- / -- / 1B	Valley and foothill grassland on heavy clay, saline, or alkaline soils at elevations of 0-230 meters. Annual herb in the Asteraceae family; blooms May-November.	**Low** Limited suitable habitat is present within the survey area. Not identified during the survey conducted in May 2023.
Chorizanthe biloba var. *immemora* Hernandez spineflower	-- / -- / 1B	Chaparral and cismontane woodlands at elevations of 600-800 meters. Perennial herb in the Polygonaceae family; blooms May-September.	**Not Present** No suitable habitat is present within the survey area. The survey area lies outside of the known elevation range of this species. Not identified during the survey conducted in May 2023.
Chorizanthe pungens var. *pungens* Monterey spineflower	FT / -- / 1B	Maritime chaparral, cismontane woodland, coastal dunes, coastal scrub, and valley and foothill grassland on sandy soils at elevations of 3-450 meters. Annual herb in the Polygonaceae family; blooms April-July.	**Not Present** Limited suitable habitat is present within the survey area. Not identified during the survey conducted in May 2023.
Clarkia jolonensis Jolon clarkia	-- / -- / 1B	Cismontane woodland, chaparral, riparian woodland, and coastal scrub at elevations of 20-660 meters. Annual herb in the Onagraceae family; blooms April-June.	**Not Present** Limited suitable habitat is present within the survey area. Not identified during the survey conducted in May 2023.
Collinsia multicolor San Francisco collinsia	-- / -- / 1B	Closed-cone coniferous forest and coastal scrub, sometimes on serpentinite soils, at elevations of 30-250 meters. Annual herb in the Plantaginaceae family; blooms March-May.	**Not Present** No suitable habitat is present within the survey area. Not identified during the survey conducted in May 2023.
Delphinium californicum ssp. interius Hospital Canyon California larkspur	-- / -- / 1B	Openings in chaparral, coastal scrub, and mesic areas of cismontane woodland at elevations of 230-1,095 meters. Perennial herb in the Ranunculaceae family; blooms April-June.	**Not Present** No suitable habitat is present within the survey area. The survey area lies outside of the known elevation range of this species. Not identified during the survey conducted in May 2023.
Eriogonum butterworthianum Butterworth's buckwheat	-- / SR / 1B	Chaparral and valley and foothill grassland on sandstone at elevations of 585-740 meters. Perennial herb in the Polygonaceae family; blooms June-July.	**Not Present** No suitable habitat is present within the survey area. The survey area lies outside of the known elevation range of this species. Not identified during the survey conducted in May 2023.
Eriogonum heermannii var. occidentale Western Heermann's buckwheat	-- / -- / 1B	Often serpentinite; usually roadsides or alluvium floodplains, rarely clay or shale slopes. Cismontane woodland (openings). 102-986 meters, blooms July-October.	**Not Present** No suitable habitat is present within the survey area. Not identified during the survey conducted in May 2023.
Eriogonum nortonii Pinnacles buckwheat	-- / -- / 1B	Chaparral and valley and foothill grassland on sandy soils, often on recent burns, at elevations of 300-975 meters. Annual herb in the Polygonaceae family; blooms May-September.	**Not Present** No suitable habitat is present within the survey area. The survey area lies outside of the known elevation range of this species. Not identified during the survey conducted in May 2023.

Species	Status (Service/CDFW/CNPS)	General Habitat	Potential Occurrence within Project Site
Lagophylla diabolensis Diablo Range hare-leaf	-- / -- / 1B	Cismontane woodland and valley and foothill grassland at elevations of 365-885 meters. Annual herb in the Asteraceae family; blooms April - September.	**Not Present** No suitable habitat is present within the survey area. The survey area lies outside of the known elevation range of this species. Not identified during the survey conducted in May 2023.
Layia heterotricha Pale-yellow layia	-- / -- / 1B	Cismontane woodlands, coastal scrub, pinyon and juniper woodlands, and valley and foothill grasslands on alkaline or clay soils at elevations of 300-1,705 meters. Annual herb in the Asteraceae family blooms March-June.	**Not Present** No suitable habitat is present within the survey area. The survey area lies outside of the known elevation range of this species. Not identified during the survey conducted in May 2023.
Malacothamnus aboriginum Indian Valley bush-mallow	-- / -- / 1B	Chaparral and cismontane woodland on rocky or granitic soils, often in burned areas, at elevations of 150-1,700 meters. Deciduous shrub in the Malvaceae family; blooms April-October.	**Not Present** No suitable habitat is present within the survey area. The survey area lies outside of the known elevation range of this species. Not identified during the survey conducted in May 2023.
Plagiobothrys uncinatus Hooked popcorn-flower	-- / -- / 1B	Chaparral, cismontane woodlands, and valley and foothill grasslands on sandy soils at elevations of 300-760 meters. Annual herb in the Boraginaceae family; blooms April-May.	**Not Present** Limited suitable habitat is present within the survey area; however, the survey area lies outside of the known elevation range of this species. Not identified during the survey conducted in May 2023.
Senecio aphanactis Chaparral ragwort	-- / -- / 2B	Chaparral, cismontane woodland, and coastal scrub, sometimes on alkaline soils, at elevations of 15-800 meters. Annual herb in the Asteraceae family; blooms January-April.	**Unlikely** No suitable habitat is present within the survey area.
Sidalcea hickmanii ssp. *hickmanii* Hickman's checkerbloom	-- / -- / 1B	Opening of chaparral at elevations of 335-1200 meters. Perennial herb in the Malvaceae family; blooms May-July.	**Not Present** No suitable habitat is present within the survey area. The survey area lies outside of the known elevation range of this species. Not identified during the survey conducted in May 2023.

STATUS DEFINITIONS

Federal

FE = listed as Endangered under the federal Endangered Species Act
FT = listed as Threatened under the federal Endangered Species Act
FC = Candidate for listing under the federal Endangered Species Act
UR = Species that have been petitioned for listing under the ESA and for which a 90 day and/or 12 Month finding has not been published in the Federal Register, as well as species being reviewed through the candidate process but the CNOR has not yet been signed
-- = no listing

State

SE = listed as Endangered under the California Endangered Species Act
ST = listed as Threatened under the California Endangered Species Act
SC = Candidate for listing under California Endangered Species Act
SR = listed as Rare under the California Endangered Species Act

CFP = California Fully Protected Species
CSC = CDFW Species of Concern
-- = no listing

California Native Plant Society
1B = California Rare Plant Rank 1B species; plants rare, threatened, or endangered in California and elsewhere
2B = California Rare Plant Rank 2B species; plants rare, threatened, or endangered in California, but more common elsewhere
-- = no listing

POTENTIAL TO OCCUR
Present = known occurrence of species within the site; presence of suitable habitat conditions; or observed during field surveys
High = known occurrence of species in the vicinity from the CNDDB or other documentation; presence of suitable habitat conditions
Moderate = known occurrence of species in the vicinity from the CNDDB or other documentation; presence of marginal habitat conditions within the site
Low = species known to occur in the vicinity from the CNDDB or other documentation; lack of suitable habitat or poor quality
Unlikely = species not known to occur in the vicinity from the CNDDB or other documentation, no suitable habitat is present within the site
Not Present = species was not observed during surveys

Appendix C

Geotechnical Engineering and Engineering Geology Report

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GEOTECHNICAL ENGINEERING AND
GEOLOGIC HAZARDS REPORT
GREENFIELD WASTEWATER TREATMENT PLANT UPGRADE
41901 WALNUT AVENUE
GREENFIELD, CALIFORNIA

March 31, 2023

Prepared for

Mr. Curtis Lam
Hydroscience Engineers

Prepared by

Earth Systems Pacific
4378 Old Santa Fe Road
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March 31, 2023

FILE NO.: 305748-001

Mr. Curtis Lam
Hydroscience Engineers
741 Allston Way
Berkeley, California 94710

PROJECT: GREENFIELD WASTEWATER TREATMENT PLANT UPGRADE
41901 WALNUT AVENUE
GREENFIELD, CALIFORNIA

SUBJECT: Geotechnical Engineering and Geologic Hazards Report

CONTRACT REF: Proposal to Provide a Geotechnical Engineering and Engineering Geology Report, Greenfield Wastewater Treatment Plant Upgrade, by Earth Systems Pacific, Doc. No. SLO-2207-052.PRP.REV, dated July 20, 2022, revised July 21, 2022

Dear Mr. Lam:

In accordance with your authorization of the referenced proposal, this geotechnical engineering and geologic hazards report has been prepared for use in the development of plans and specifications for the Greenfield Wastewater Treatment Plant Upgrade project in Greenfield, California.

This report describes the general geotechnical and geologic characteristics, identifies existing and potential geotechnical and geologic hazards, and discusses the impacts that these conditions could have upon the project. Preliminary geotechnical recommendations for site preparation, grading, utility trenches, foundations, moisture vapor transmission, retaining walls, vehicle pavement sections, drainage and maintenance, and observation and testing are presented herein. An electronic copy of this report is being provided for your use.

We appreciate the opportunity to have provided services for this project and look forward to working with you again in the future. If there are any questions concerning this report, please do not hesitate to contact the undersigned.

Sincerely,

Earth Systems Pacific

Nicholas R. Zoetewey
GE 3137

Aileen A Flynn

NO. 2423
Darrin G. Hasham

Nick Zoetewey, GE
Senior Engineer

Aileen Flynn, EIT
Staff Engineer

Darrin G. Hasham
Principal Geologist

Doc. No.: 2303-086.SGR/cr

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APPENDICES

1.0 INTRODUCTION AND PROJECT DESCRIPTION

An upgrade to the existing Greenfield Wastewater Treatment Plant is planned, which is located at 41901 Walnut Avenue in Greenfield, California. The approximate location of the wastewater treatment plant is shown on Figure 1 - Site Vicinity Map in Appendix A and will herein be referred to as "the site." Based on the undated preliminary site plan provided by Hydroscience Engineers (the client), the proposed upgrade will consist of installing a multi-unit package treatment plant and abandoning the existing facilities after the new plant is operational. We understand the package treatment plant will include four membrane bio-reactor (MBR) units, the disinfection infrastructure, two pump stations, and electrical building, all located near the northern corner of the site, and headworks, sludge dewatering system, and operations/admin building will be located near the southern corner of the site. A grit removal and equalization basin is proposed near the western corner of the site while a storm water retention basin is proposed near the eastern corner of the site. We understand there are no retaining walls planned at the site.

We understand that the proposed treatment facilities will generally be of reinforced concrete construction, with the electrical and operations buildings likely of wood or steel-framed construction. All structures will be supported with reinforced mat foundation systems. Additional improvements will consist of underground influent/effluent pipelines and other utilities and hot-mix asphalt (HMA) and Portland cement concrete (PCC) vehicular pavements. We understand there are no retaining walls planned at the site.

Based on information provided by the client, finish surface grades for the MBR units, disinfection area, pump stations, electrical building, and the two basins will be at El. 229, while finish surface grades for the structures near the southern corner of the site will slope upward and range from El. 238 to El. 240. The basins will be roughly 9 feet deep, with basin bottoms at El. 220. The bottom of the headworks vault and pump stations will be roughly 10 feet below finish surface grades, which will result in their bottoms at roughly El. 228 to El. 230, and El. 219, respectively. Existing site grades generally range from El. 210 to El. 240, with stockpiles reaching El. 262, which will be removed during construction. Based on shown existing and finish grades, site grading will consist of cuts up to 23 feet and fills up to 10 feet relative to existing site grades.

2.0 SCOPE OF SERVICES

The scope of work for this report included a field reconnaissance by a geotechnical engineer and a certified engineering geologist, subsurface exploration, laboratory testing of samples secured during the field investigation, geotechnical and geologic analyses of the field and laboratory data, and preparation of this report.

This report and preliminary geotechnical recommendations are intended to comply with the considerations of Sections 1803.1 through 1803.7, J104.3 and J104.4, as applicable, of the 2022 California Building Code (CBC) and common geotechnical engineering and engineering geology practice in this area under similar conditions at this time. The geotechnical test procedures were accomplished in general conformance with the standards noted, as modified by common geotechnical engineering practice in this area under similar conditions at this time.

Preliminary geotechnical recommendations for site preparation, grading, utility trenches, foundations, moisture vapor transmission, retaining walls, vehicle pavement sections, drainage and maintenance, and observation and testing are presented to guide the development of project plans and specifications. As there may be geotechnical or geologic issues yet to be resolved, the geotechnical engineer and the engineering geologist should be retained to provide consultation as the design progresses, to assist in verifying that pertinent geotechnical and geologic issues have been addressed and to aid in conformance with the intent of this report. It may also be advantageous to retain the geotechnical engineer and engineering geologist to review the project plans and details as they near completion, to further aid in conformance with the intent of this report.

It is our intent that this report be used exclusively by the client in the preparation of plans and specifications. Application beyond this intent is strictly at the user's risk.

This report does not address issues in the domain of contractors such as, but not limited to, site safety, loss of volume due to stripping of the site, shrinkage of soils during compaction, excavatability, dewatering, shoring, temporary slope angles, construction means and methods, etc. Analyses of the soil for mold potential, man-made products containing asbestos, lead, radioisotopes, hydrocarbons, or chemical properties are beyond the scope of this report. Evaluation of the site for suitability for LID/BMP improvements or drainage basins; ancillary features such as temporary or permanent fences, flag and light poles, signage; and nonstructural fills are not within our scope and are also not addressed.

In the event that there are any changes in the nature, design, or location of improvements, or if any assumptions used in the preparation of this report prove to be incorrect, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed, and the conclusions of this report are verified or are modified in writing. The criteria presented in this report are considered preliminary until such time as any peer review or review by any jurisdiction has been completed, conditions are observed by the geotechnical engineer and/or engineering geologist in the field during construction, and the recommendations have been verified as appropriate or modified in writing.

3.0 SITE SETTING

The general site location is in the northeast sector of Greenfield, California, which is shown on Figure 1 – Site Vicinity Map in Appendix A. The site is bordered by Walnut Avenue to the southeast, Espinosa Road to the northwest and northeast, and agricultural fields to the southwest. The approximate site coordinates of latitude 36.3412° N and longitude 121.2245° W were obtained from the Google Earth Website (Google Earth 2023). The elevation of the site, as obtained from the existing topo provided by the client ranges from approximately El. 210 to El. 240, with stockpiles reaching El. 262.

The existing wastewater treatment facilities are located at the approximate center of the site, to be demolished after construction. The site is terraced with the southern half at a higher elevation than the northern half. The elevation difference between the majority of the upper and lower halves of the site is up to 20 feet, according to the existing topo provided by the client. The lower portion of the site is improved with treatment basins which will be backfilled or rebuilt during construction.

4.0 FIELD INVESTIGATION

Our field investigation consisted of two cone penetration tests (designated CPT 1 and CPT 2) that were performed on December 7, 2022 and 12 exploratory borings (designated B1 through B12) that were performed on December 7, 2022 and December 28, 2022. The approximate locations of the CPTs and borings are shown on Figure 2 – Exploration Location and Overexcavation Areas Map in Appendix A.

CPTs 1 and 2 were advanced with a 1.75-inch diameter cone mounted to a 25-ton truck to depths of approximately 46.5 to 49 feet below the existing ground surfaces (bgs), respectively, where practical refusal was encountered in both CPTs. Correlated SPT (N) blow counts and soil classifications were inferred using methods developed by Robertson and Campanella (1989). Shear wave velocity measurements were performed at CPT 2, which are included in the CPT data provided in Appendix A.

The December 7, 2022, borings were advanced with a truck-mounted Mobile B-24 rig equipped with 6-inch hollow stem auger and a manual cathead hammer for sampling. The borings performed on December 28, 2022 were advanced with a track-mounted Geoprobe 7822DT with automatic hammer for sampling. The borings were advanced to depths ranging from approximately 16.5 to 51.5 feet bgs, respectively. As the borings were advanced, soil samples were obtained using a 3-inch outside diameter ring-lined barrel sampler (ASTM D 3550-17 with shoe similar to ASTM D 2937-17). Standard Penetration Tests (SPT) (ASTM D 1586-11) using a 2-inch outside diameter sampler were also conducted at selected depths in the borings and bag samples were obtained from the auger cuttings at varying depths.

Soils encountered in the borings were categorized and logged in general accordance with the Unified Soil Classification System and ASTM D 2488-17. A copy of the boring logs and a boring log legend are included in Appendix A. In reviewing the boring logs and legend, the reader should recognize that the legend is intended as a guideline only, and there are a number of conditions that may influence the characteristics observed during drilling. These include, but are not limited to, the presence of cobbles or boulders, cementation, variations in soil moisture, presence of groundwater, and other factors. Consequently, the logger must exercise judgment in interpreting the subsurface characteristics, possibly resulting in soil descriptions that vary somewhat from the legend.

5.0 LABORATORY ANALYSIS

Selected samples obtained from the borings were tested for unit weight and moisture content (ASTM D 2937-17 and ASTM D 2216-19, as modified for ring liners), expansion index (ASTM D 4829-21), maximum density and optimum moisture content (ASTM D 1557-12), cohesion and angle of shearing resistance (ASTM D 3080-11), R-Value (ASTM D 2844-18), grain size distribution by sieve analysis (ASTM D 1140-17), and plasticity index (ASTM D 4318-17). The laboratory test results are presented in Appendix B.

6.0 GENERAL SUBSURFACE AND GEOLOGIC PROFILE

Local conditions recorded on our borings logs for the site indicate that the subsurface stratigraphy is the result of dynamic depositional and erosional mechanisms resulting from the proximity to the Salinas River. The site spans across an ancient river bank, with the southern part of the site on the upper bank at an elevation approximately 20 feet higher than the northern part of the site. The ancient river bank was observed in historical aerial photographs to trend in a northwest to southeast direction. Strata observed in our borings are generally not continuous across the site and are typical of a braided stream depositional environment, similar to the current Salinas River. Construction of the wastewater treatment plant has created variable depths of fill across the site in the form of roads, embankments, and berms. The region is also intensively farmed and agricultural activities may pre-date the construction of the plant and would have disturbed the shallow subsurface to some extent.

Undocumented fill was observed in our borings to depths that ranged from a few inches to approximately 8 feet thick. The alluvium ranged from clay to poorly graded sand, locally with gravel. The granular occurrences of alluvium ranged from loose to medium dense and were slightly moist to very moist. The fine grained sediments ranged from soft to stiff and were moist to wet. Bedrock was not encountered. Groundwater was encountered in Boring 10 at approximately 25 feet bgs. Please refer to the boring logs and CPT data in Appendix A for a more complete description of the subsurface conditions encountered in the borings and inferred in the CPTs.

7.0 GEOLOGY

Geologic Setting

The site lies within the Salinas Valley, in the Coast Ranges geomorphic province (CGS 2002). East of the site the Salinas Valley is bounded by the Cholame Hills and to the west by the Santa Lucia Range. Locally, the site lies on an alluvial plain of the Salinas River, which is approximately ½ mile to the north-northeast. The Geologic Map of the Greenfield Quadrangle (Dibblee 1971) indicates the site is underlain by alluvial deposits. The geologic conditions depicted on the regional geologic map are consistent with the deposits encountered during the subsurface investigation (see Figure 3 – Regional Geologic Map in Appendix C).

Faulting

Faults are classified by the State of California based on the likelihood of generating ground motions and surface rupture. The classification system applies to known faults that have been compiled by numerous researchers through various methods of investigation. The State evaluates faults with documented ground rupture during the last 11,700 years and considers them for inclusion in Earthquake Fault Zones requiring investigation (A-P Zones) which encompass traces of *Holocene-active* faults, as defined by the State's Alquist-Priolo Earthquake Fault Zoning Act (1972). The State's guidance is intended to prohibit developments and structures for human occupancy across the trace of active faults. Other active faults capable of generating strong ground motion are present in the region but are not included in A-P Zones because they do not meet the criteria of "sufficiently active and well-defined."

Significant Faults

The site is within a seismically active region and the project will experience seismic shaking during its design life. Known faults and fault systems within the region that potentially could generate earthquakes affecting the site include the Rinconada, La Panza, Oceanic-West Huasna, San Juan and San Andreas faults (USGS 2013). These are several of the primary known faults within a 65-mile radius of the site; other faults may exist in the region and movement on any of these faults could affect the proposed development during its design life. The closest significant mapped fault to the site is the Reliz fault, located approximately 6.3 miles southwest of the site. The San Andreas and Hosgri faults are significant regional *Holocene-active* faults that are included in A-P Zones. Regional faults and locations of historic earthquake events are depicted on Figure 4 - Historical Earthquake/Fault Map in Appendix C. A list of faults in the State's seismic model is included in Table D-1 in Appendix D.

Reliz fault

The Reliz fault is located approximately 3.6 miles to the southwest and is a high-angle reverse fault, which offsets Salinian block crystalline basement rocks and locally juxtaposes Pliocene-Pleistocene age Paso Robles formation against basement rocks (Rosenberg and Bryant 2003). The Reliz fault is modeled as two sections, the Sierra de Salinas section, which is approximately 34 miles long extending from Spreckles southeastward to Arroyo Seco, and the Blanco section, which is approximately 15 miles long and extends northwestward from Spreckles to Monterey Bay where it trends offshore. The USGS reports that the Reliz fault is capable of a magnitude 7.44 earthquake (2014). Most of the offset on this fault appears to have been reverse dip-slip with Sierra de Salinas and Salinian basement uplifted to the southwest by as much as 3,000 meters. Some investigators consider the Reliz fault a northern extension of the Rinconada fault (Dibblee 1976).

Rinconada Fault Zone

The Rinconada fault zone lacks obvious Holocene offset and therefore does not meet the State's criteria for inclusion in an A-P zone; nonetheless, it is considered an active fault and is included as a seismic source in regional models. The Rinconada fault is a northwest trending high angle fault that forms the boundary between two dissimilar geologic terranes. Northeast of the Rinconada fault is the Salinian block, composed of crystalline plutonic and metamorphic rock overlain by a thick sequence of marine sedimentary rocks. Southwest of the Rinconada fault is the Coastal block, composed of Franciscan mélange overlain by marine sedimentary rocks (Dibblee 1976). The Rinconada fault is mapped approximately 9.2 miles south-southwest of the site and is estimated to be capable of a magnitude 7.5 earthquake (Cao et al 2003).

San Andreas Fault

The San Andreas fault is considered the potential source of the largest regional earthquake. The San Andreas fault has a total length of approximately 672 miles and is divided into segments based on geometry and known historic behavior. The Parkfield segment is located approximately 16.8 miles northeast of the site, is approximately 27 miles long and is in an A-P Zone (CDMG 1986b). This segment is reported to be the location of several moderate magnitude earthquakes with a recurrence interval averaging 22 years and may have ruptured during the magnitude 7.9 earthquake in 1857 (Bryant and Lundberg 2002).

Groundwater

Groundwater was encountered in Boring 10 at approximately 25 feet bgs, or El. 197. We accessed public well records on the State's Water Data Library and State well No. 18S07E28K001M located approximately 2,800 feet southeast of the site and 18S07E20K001M, located approximately 3,500 feet northwest of the site provide historical records useful to interpolate a historical high groundwater level at the site. Groundwater potentially could be present at El. 200, correlating to a depth of about 20 feet bgs for the majority of the lower parts of the site (DWR 2023). Fluctuations in groundwater levels are likely as a result of the site's proximity to the Salinas River.

8.0 SEISMICITY

Earthquake History

The historic seismicity in the site's region was researched using the Advanced National Seismic System (ANSS 2022) which maintains a composite catalog of historical California earthquakes. We compiled the epicentral distance for earthquakes satisfying three search parameters: 1) magnitudes greater than 5.5; 2) within a 65-mile radius of the site; and 3) occurrence from 1800 to December 2022. The epicentral distances should be considered estimates particularly for earthquake data prior to 1932 when modern instruments were first used to record earthquake data. The site coordinates used in this search were 36.3412° N and 121.2245° W. Figure 4 – Historical Seismicity Map presented in Appendix C graphically depicts historical earthquake epicenters, their corresponding magnitudes, and the faults within the general region of the project.

Results of the search indicated that within the search parameters, over 40 earthquakes with magnitude greater than or equal to 5.5 have occurred within 65 miles of the site (see Figure 4 – Historical Seismicity Map). The largest magnitude earthquake that occurred during the 222-year time period was the 1857 Great Tejon earthquake with a magnitude of 7.9. This event was located approximately 26 miles southeast of the site. The closest earthquake to the site occurred approximately 0.3 miles west of the site on July 4, 2005 and had an estimated magnitude of 5.7. The 40 historical earthquakes closest to the site are presented in Table D-2, Historical Earthquakes in Vicinity of Project Site, M≥5.5, in Appendix D.

Historical earthquakes that resulted in damage within the region include the Fort Tejon earthquake of 1857. This event was caused by an approximately 225-mile-long rupture on the San Andreas fault, from the Cholame Valley almost to Wrightwood. Approximately 30 feet of horizontal displacement was observed on the Carrizo Plain, heavy damage was sustained at Fort Tejon (an Army post located about 4 miles from the San Andreas fault), and one person was killed in a collapsed building in Gorman.

On December 22, 2003, a 6.6-magnitude earthquake occurred approximately 6 miles northeast of San Simeon, California and approximately 45 miles west of the site. Analysis by the USGS and the University of California indicates that the event had a thrust (reverse-faulting) displacement (EERI, 2005). The earthquake occurred in the vicinity of the northern end of the Hosgri-San Simeon Fault and resulted in significand damage in Paso Robles and Oceano.

Ground Motion Analyses

In accordance with the 2022 CBC and ASCE 7-16 (2017, 2018 & 2021), an assessment was made to determine the need for employing "Site-Specific Ground Motion Procedures" to calculate the ground motion parameters for the project. Based on the results of our liquefaction analysis, the site has the potential for liquefaction to occur, per Section 20.3.1 and Table 20.3-1 of ASCE 7-16 (2017), the site should be classified as Site Class "F. Soils Requiring Site Response Analysis." However, Exception 1 in Section 20.3.1 of ASCE 7-16 (2017) states that *"For structures that have a period of vibration equal to or less than 0.5 seconds, site response analysis is not required to determine spectral accelerations for liquefiable soils,"* and that the Site Class is permitted to be determined in accordance with Section 20.3 of ASCE 7-16 (2017).

We have assumed that the fundamental periods of the structures will be 0.5 seconds or less. This assumption shall be confirmed by the project structural engineer, as a site response analysis would be required per Sections 20.2 and 20.3 of ASCE 7-16 (2017) if the structures' fundamental periods are greater than 0.5 seconds.

Based on our site evaluation, and in utilizing the exception above, the subsurface characteristics are those of Site Class "E - Soft Clay Soil" as defined by Table 20.3-1 in ASCE 7-16 (2017), based on SPT and CPT data. The mapped ground motion values were obtained from the Structural Engineers Association of California website (SEAOC 2023) using ASCE 7-16 (2017) for Site Class E. The value S_S is 1.500 g which is greater than 1.0, and the S_1 value is 0.573 g which is greater than 0.2 g; therefore, per Section 11.4.8, of ASCE 7-16, Supplement 3 (2021), the project requires site-specific ground motion analyses unless an exception permitted by the Standard is invoked. We performed a site-specific ground motion hazard analysis to develop the seismic design parameters in accordance with Sections 11.4.8, 21.2, and Supplement 3 of ASCE 7-16 (2017 & 2021).

A risk-targeted maximum considered earthquake (MCE_R) modeling procedure was performed in accordance with ASCE 7-16 (2017) including a Probabilistic Seismic Hazard Analysis (PSHA) and a Deterministic Seismic Hazard Analysis (DSHA). These analyses are based on knowledge of the regional tectonic setting, geology, and seismicity. A PSHA using ground motion data from the USGS Unified Hazard Tool (USGS 2022b) and a DSHA using the Third Uniform California Earthquake Rupture Forecast (UCERF3) fault model (USGS 2013) and NGA-West2 ground motion prediction equations (PEER 2015) were used as described in Section 21.2.1.1 (Method 1) of ASCE 7-16 (2017) to estimate the peak ground motion corresponding to the uniform hazards earthquake and MCE_R, which has a 2 percent probability of being exceeded in 50 years.

Our DSHA calculated the site-specific ground response anticipated to be generated by a 7.44 magnitude event on the Reliz fault at a distance of 6.3 miles. The fault parameters that we considered in our analysis are shown on Table D-1 – Fault Parameters, presented in Appendix D. The Site-Specific Spectral Response values are presented in Table D-4. The primary seismic risks at the site are from earthquakes generated by the Reliz, Rinconada and San Andreas faults. Although the Reliz fault is thought to potentially generate the most severe seismic shaking at the site, any regional fault could produce seismic shaking.

The 2022 CBC seismic design criteria are based on a Design Earthquake that produces ground motion ⅔ of the lesser of an earthquake with 2 percent probability of occurrence in 50 years, or the maximum 84th percentile of the mean deterministic MCE. The deterministic spectra calculated with NGA-West2 ground motion prediction equations are shown on Table D-3 – Deterministic Spectral Response Values presented in Appendix D.

Seismic Design Category

We have assumed that the project is classified as Risk Category III per Table 1604.5 of the 2022 CBC. Section 1613.2.5 of the 2022 CBC states that *structures classified as Risk Category I, II or III* *that are located where the mapped spectral response acceleration parameter at 1-second period,* S_1*, is greater than or equal to 0.75 shall be assigned to Seismic Design Category E… others shall be assigned to Design Category D*. The S_1 for the site is 0.573, less than 0.75; therefore, the site should be assigned to Seismic Design Category D.

Seismic Design Parameters

This site may be subject to strong ground shaking due to potential fault movements along regional faults including the Reliz fault, whose proximity and magnitude potential was considered during our site-specific analysis. The minimum seismic design should comply with the 2022 CBC and ASCE 7-16. The resulting seismic coefficients considering Site Class E are given in the table below.

TABLE 1: SITE-SPECIFIC SEISMIC PARAMETERS (2022 CBC/ASCE 7-16)

Seismic Design Category	D
Site Class	E
Mapped and Code Based Ground Motion	
Short Period Spectral Response, S_s	1.500 g
1 second mapped Spectral Response, S_1	0.573 g
Design Earthquake Ground Motion	
Short Period Spectral Response, S_{DS}	0.924 g
1 second Spectral Response, S_{D1}	1.598 g
Peak Ground Acceleration (PGA_M)	0.600 g
MCE Spectral Response Acceleration	
Short Period Spectral Response, S_{MS}	1.387 g
1 Second Period Spectral Response, S_{M1}	2.398 g
Site Amplification Factors	
Short Period Site Coefficient, F_a	1.00
1 Second Period Site Coefficient, F_v	4.00
Vertical Site Coefficient, C_v	1.40
Risk Coefficient (Short Period), C_{Rs}	0.981
Risk Coefficient (1 Second Period), C_{R1}	0.944

Vertical accelerations are typically ⅓ to ⅔ of the horizontal accelerations but can equal or exceed the horizontal accelerations depending upon the fault type, local site effects and amplification. Acceleration values provided are estimates only. Tables presenting the fault parameters and spectral response values are presented in Appendix D.

Alternatively, if the fundamental period of the structure is less than 0.5 seconds and the equivalent static force procedure is used for design in accordance with Section 11.4.8 Exception No. 1 (ASCE 2017) or where (i) the value of S_{ai} is determined by Eq. 15.7-7 for all values of T_i and (ii) the value of the parameter S_{D1} is replaced with $1.5S_{D1}$ in Eq. 15.7-10 and 15.7-11, Exception No. 2 presented in ASCE 7-16 Supplement 3, the general procedure seismic design parameters may be used. The structural engineer shall verify that the exception applies before using the general procedure seismic design values. The *unscaled* general procedure seismic design values are presented in Table D-5.

9.0 GEOLOGIC HAZARDS

Surface Ground Rupture

Surface ground rupture generally occurs at sites that are traversed by, or lie very near to, a causative fault. The site is not located in any State or County mapped Earthquake Fault Zones CGS 2023, Monterey Co. 2023). The closest mapped active fault to the site is the Reliz fault, located approximately 6.3 miles west of the site. The lack of mapped faults on site, or trending towards the site lead us to conclude that the potential for surface fault rupture at the site is low.

Seismically Induced Settlement

Liquefaction

Liquefaction refers to a phenomenon that tends to occur in saturated soils (soils below the groundwater table) of low density that have grain sizes within a certain range, usually fine- to medium-grained poorly graded sands, silty sands, and silts. A sufficiently strong earthquake is also required to cause liquefaction. During liquefaction, the energy from the earthquake causes the water pressure within the pores of the soil to increase. The increase in water pressure decreases the friction between the soil grains, allowing the soil grains to move relative to one another. During this state, the soil will behave as a viscous liquid, temporarily losing its ability to support foundations and other improvements. The high-pressure water will flow through the soil along the path of least resistance. As the pressure is released, the soils typically settle in a process called “liquefaction settlement.” Liquefaction settlement can cause damage to structures and other surface and subsurface improvements.

The site is located in an area mapped by the City of Greenfield as having a moderate to high potential for liquefaction (Monterey Co. 2018). The highest historical groundwater level of El. 200 corresponding to 19 feet and 28 feet below lowest finished grades for the upper and lower portions of the site, respectively, as noted in the “Geology – Groundwater” Section of this report, were utilized.

Data from CPTs 1 and 2 were reviewed and analyzed for liquefaction potential, following the guidelines of Special Publication 117A (CDMG 1997, Revised 2008), using CLiq v.3.5.2.5, a CPT liquefaction analysis software program developed by GeoLogismiki (2007). The software allows the use of various analysis methods developed by Robertson and Wride (1998), Robertson (2009), Idriss and Boulanger (2008), Boulanger and Idriss (2014), Moss and others (2006), and Robertson and Shao (2010). Input parameters included the depth to groundwater, tip resistance, sleeve friction, and seismic parameters developed from the seismic analyses. An earthquake magnitude of 6.41 (developed using a Probabilistic Seismic Hazard Deaggregation) and a PGA_M of 0.600 g were used in the analyses. A factor of safety of 1.30 was used to determine the liquefaction potential.

In the analyses, much of the sandy soil layers were determined to be prone to liquefaction settlement under the expected seismic conditions. The analyses of the CPT data indicated settlement resulting from liquefaction could be on the order of 5 inches for the lower/northern portion of the site; negligible settlement resulting from liquefaction was esimated for the upper/southern portion of the site (please see liquefaction analysis calculations in Appendix E).

Additionally, the work of Youd and Garris (1995) indicates the non-liquefiable cap above the soils susceptible to liquefaction does not have sufficient thickness to prevent ground rupture resulting from liquefaction. Increased settlement of structures due to temporary loss of soil bearing capacity resulting from ground rupture could occur; therefore, actual settlement where ground rupture may occur could be more than the estimated settlements.

Although our analyses indicated potential liquefaction settlement to be on the order of 5 inches, and potentially higher, due to the potential for ground rupture, it is our opinion that this figure is overly conservative. Based on the potential for void redistribution within the area above the liquefiable layers, the potential for arching effects, and the proposed soil reinforcement and foundation program mentioned in the latter sections of this report, all of which have the potential to reduce the magnitude of liquefaction settlement at the surface, we estimate maximum settlement due to liquefaction will be on the order of 3 inches or less. Please see the liquefaction settlement calculations in Appendix E for more information.

Recommendations to address the potential settlements resulting from liquefaction (including ground rupture) are discussed in the “Grading” and “Foundations” Sections of this report.

Settlement of Unsaturated Soils

Seismic settlement may also occur within unsaturated soils during a seismic event; therefore, the unsaturated loose to medium dense sandy layers were evaluated.

Use of ⅔ PGA_M as Design Acceleration for Analysis

The reasoning for using ⅔ PGA_M originally stemmed from the limitations of the Pradel method (1998) of calculating dry seismic settlement. This occurred during the code change from ASCE 7-05 to ASCE 7-10 (2013), where it was no longer codified to evaluate liquefaction and seismic settlement as $S_{DS}/2.5$ and evaluation was to be at full PGA. When using the full PGA_M in Pradel's method of calculating dry sand settlement, the potential settlements increased dramatically at high accelerations and resulted in unreasonable amounts of settlement as the curves defaulted to 10 percent vertical strain. Given these unreasonably high potential settlements, and after much discussion with various jurisdictions, the PGA used for dry seismic analysis was returned to a "design" value since dry seismic shaking will typically not cause bearing failure (like liquefaction will), which is consistent with this site. PGA_M was considered a maximum credible-type value and S_{DS} is equal to ⅔ S_{MS}, where S_{MS} is the maximum credible-type value.

The method developed above was in response to the PGA recommendation for use in ASCE 7-10. Given that the language regarding the use of PGA_M in Chapter 12 of ASCE 7-16 is consistent with that discussed in ASCE 7-10, it is our interpretation that the use of ⅔ PGA_M is an appropriate acceleration parameter in the analysis of seismic settlement of unsaturated soils.

Analysis and Results

We evaluated the loose to medium dense, unsaturated layers in Borings 3, 5 and 10, which we considered representative for our analysis. We used the work of Pradel (1998) to perform our analysis, which required input parameters for PGA, earthquake magnitude and corrected penetration resistance, among others. The input PGA was ⅔ PGA_M as noted in the previous subsection and the earthquake magnitude was developed using a PSHA deaggregation (USGS 2023a). The corrected penetration resistance included that for hammer energy ratio for both drill rigs. The hammer energy ratio was assumed to be 80 percent for the Geoprobe 7822 DT and 60 percent for the Mobile B-24. This resulted in energy ratios (C_E) of 1.33 and 1.00 for the Geoprobe and B-24, respectively, which was applied to the calculations.

Our analyses indicated that seismically induced settlement corresponding to unsaturated sandy soils could be on the order of 0.7-inch within the plant upgrade areas. Please see the settlement calculations in Appendix E for more information on the parameters used.

Slope Stability

The site sits astride an ancient river bank of the Salinas River which creates an elevation differential of approximately 20 feet from the higher portion of the site to the lower portion. At the site, the ancient stream bank has been modified through construction and use of the wastewater treatment plant which has created ponds, berms and roads. The site is generally designated as Class 0 for deep seated landslides which indicates very low potential, however the ancient river bank is designated as Class 6, which indicates a moderate potential for deep seated landslides (Wills and Gutierrez 2011). It is our understanding that the proposed upgrades to the facility will include grading of the slope which should be done in a manner that mitigates the low to moderate hazard from slope instability.

Flooding

According to Flood Insurance Rate Map (FIRM) Number 06053C0850G, dated April 2, 2009, published by the Federal Emergency Management Agency (FEMA), the site is partially located within Flood Zone A, which is a 1 percent annual chance (100-year) flood zone without base flood elevation determined. The 100-year flood zone appears to extend to the ancient river bank described in the slope stability section. The parts of the site at the top of the ancient river bank are designated Flood Zone X, which is an area of minimal flood hazard (see Figure 5 – FEMA Flood Zone Map in Appendix C).

Downstream Dam Inundation

As described in the flooding section above, the ancient river bank of the Salinas River is anticipated to contain flood waters that result from catastrophic failure of the Nacimiento dam or San Antonio dam (AECOM 2017a, b). The Monterey County Water Resource Agency indicated that flooding at the site may range from one to 10 feet, arriving approximately 24-hours after dam failure for Nacimiento dam and approximately 12 hours after dam failure for the San Antonio dam (AECOM 2017a, b).

Tsunami and Seiche Potential

Hazardous tsunamis along the California coastline are generally associated with seismic events and are typically caused by vertical displacement of submarine faults. As the site is located approximately 30 miles east of the Pacific Ocean, there is no potential for a tsunami to flood the site.

A seiche is a water wave that can be generated in a reservoir, lake or pond as the result of barometric pressure anomalies and wind or surface waves generated by earthquakes. The ponds maintained by the treatment plant are too small to be experience significant effects from barometric pressure and wind; although, a strong earthquake on a regional fault potentially could cause seismic “sloshing” of the ponds which could then overtop embankments, depending on the freeboard of the ponds at the time of the earthquake.

Naturally Occurring Asbestos

Asbestos minerals are generally limited to only a few types of rocks known to be present in the coast ranges of California. These are ultra-mafic igneous rocks and their metamorphic equivalents which include serpentinite and some types of schist. The site is underlain by alluvial sediments which are not considered asbestos bearing. Consequently, there are no indications that friable asbestos is present at the site.

Radon

Radon is a colorless, odorless gas present in soil and rock, which is derived from the decay of uranium. The occurrence of radon correlates with the presence of specific minerals, and its concentrations in soil or rock will vary depending on the mineralogy of the surrounding bedrock, temperature, barometric pressure, moisture and other factors. Prolonged exposure to elevated levels of radon is associated with an increased risk of lung cancer. The route of exposure is via inhalation.

According to the California Geological Survey areas of Monterey County that are underlain by bedrock of the Monterey formation could potentially have radon. The site is underlain by alluvial deposits. The State Indoor Radon Potential map indicates that the site is located in an area of low radon potential (CGS 2023).

10.0 CONCLUSIONS

In our opinion, the site is suitable, from a geotechnical engineering and engineering geology standpoint, for the construction of the proposed improvements as described in the “Introduction and Project Description” Section of this report, provided the recommendations contained herein are implemented in the planning, design and construction. The primary geotechnical engineering and engineering geologic concerns are the potentials for strong ground shaking, seismic settlement, differential settlement and soil erosion potential. Further discussions of these concerns are provided in the following paragraphs. Provided that the building areas are prepared as recommended in the “Grading” Section of this report, mat foundations may be used to support the proposed structures. The upper soils were tested and found to be nonexpansive; therefore, no special measures with respect to expansive soils are considered necessary.

Strong Ground Shaking

The site is in a region of high seismic activity, with the potential for large seismic events that could generate strong ground shaking. A seismic analysis was undertaken to provide seismic acceleration design parameters. Our methods and the results of the seismic analysis are presented in the “Seismicity” Section of this report.

Seismic Settlement

As discussed in the “Geologic Hazards” Section of this report, liquefaction settlement is estimated to be on the order of 3 inches or less. Additionally, the potential seismic settlement resulting from shaking of the unsaturated loose to medium dense sandy soils is estimated to be on the order of 0.7-inch. The total magnitude of seismic settlement at the site is estimated to be on the order of 3.7 inches or less, reduced per recommendations in the “Foundations” and “Grading” Sections of this report.

Differential Settlement

Settlement (total and differential) can also occur when foundations and surface improvements span materials having variable consolidation, moisture, and density characteristics, such as the native soils and existing fill. To reduce this settlement potential, it is necessary for all foundations and surface improvements to bear on material that is as uniform as practicable. To reduce this potential for total and differential settlement, a program of overexcavation and recompaction is recommended per the “Grading” Section of this report, to create sufficiently uniform bearing conditions.

Erosion Potential

The site soils are considered to be highly erodible. Stabilization of surface soils, particularly those disturbed during construction, by vegetation or other means during and following construction is essential to reduce the potential for erosion damage. Care should be taken to establish and maintain proper drainage around the structures and improvements.

Indoor Radon Potential

The site is in a State designated area with a low potential for radon gas and its daughter products to accumulate in enclosed spaces. The architect/engineer should designate special measures as considered necessary for construction to mitigate the low potential for radon accumulation.

11.0 PRELIMINARY GEOTECHNICAL RECOMMENDATIONS

The following recommendations are for improvements constructed as described in the "Introduction and Project Description" Section of this report. If other improvements not previously mentioned are included, the geotechnical engineer should be contacted for revised recommendations.

Unless otherwise noted, the following definitions are used in the recommendations presented in this report. Where terms are not defined, definitions commonly used in the construction industry are intended.

- **Building Areas:** The building areas are defined as the areas within and extending a minimum of 5 feet beyond the perimeter of the foundations. The building area also includes the footprint of any improvements which are rigidly connected to the structure, that are expected to perform in a similar manner.
- **Lower Improvement Area:** Improvements in the lower portion of the site, including MBR treatment plant, electrical building, pump stations, UV disinfection unit, standby generator, and fine screen/flow splitter box.
- **Upper Improvement Area:** Improvements in the upper portion of the site, including operations building, sludge dewatering system, and headworks.
- **Vehicle Pavement Areas:** The areas within and extending a minimum of 1 foot beyond the limits of any areas to receive pavement for vehicle use, such as parking areas, drive aisles, and/or trash enclosure pads.
- **Basin Areas:** The area within and extending a minimum of 5 feet beyond the perimeter of the basin. Basin areas include both proposed stormwater retention and equalization/grit removal basins.
- **Existing Basin Areas:** The area within and extending to the outermost perimeter of the basins at the site at this time.
- **Grading Area:** The entire area to be graded, including the building areas, sitework retaining wall areas and basin areas.
- **Existing Grade:** Elevations of the site that existed as of the date of this report.
- **Finish Pad Grade:** The elevation in the building area where earthwork operations are typically considered to be complete. It does not include any sand or gravel that might be placed below slabs in association with vapor protection for the slabs.

- **Subgrade:** The elevation of the surface upon which a sand cushion/nonexpansive imported material or aggregate base (AB) will be placed for vehicular pavements.
- **Scarified:** Plowed or ripped in two orthogonal directions to a depth of not less than 8 inches.
- **Moisture Conditioned:** Adjusting the soil moisture to optimum moisture content, or just above, prior to application of compactive effort.
- **Compacted/Recompacted:** Soils placed in level lifts not exceeding 8 inches in loose thickness and compacted to a minimum of 95 percent of maximum dry density, unless otherwise noted. Based on maximum dry density by ASTM D 1557-12 and field density by ASTM D 6938-17a, or other methods acceptable to the geotechnical engineer and jurisdiction.

Site Preparation

1. The ground surfaces in the grading areas should be prepared for construction by removing all existing improvements not to remain. Existing utility lines that will not remain in service should be either removed or abandoned. The appropriate method of abandonment will depend upon the type and depth of the utility. Recommendations for abandonment can be made as necessary.

2. Voids created by the removal of materials or utilities described above should be called to the attention of the geotechnical engineer. No fill should be placed unless the underlying soil has been observed by the geotechnical engineer.

Grading

Lower Improvement/Basin Areas

To reduce the magnitude of potential static and seismic differential settlements, as well as ground rupture, the proposed structures in the lower improvement area should be supported on reinforced concrete mat foundations over engineered fill reinforced with stabilization fabric and/or geogrid. The basin areas should be supported with engineered fill reinforced with stabilization fabric and/or geogrid. These areas are noted as Overexcavation #1 through #3 in Figure 2.

1. Following site preparation, the existing soils within the building and basin areas should be removed to a level plane at the lowest existing elevation within the overexcavation area, as shown in Figure 2. The resulting surfaces should then be scarified, moisture conditioned and recompacted.

2. Geotextile stabilization fabric (Mirafi HP570 or equivalent) or geogrid (Tensar Triax TX7 or equivalent) should be placed in the bottom of the excavation (the two types of reinforcement should not be combined in a single layer). The fabric/geogrid should be stretched as tightly as practicable and held in place using pins or other methods recommended by the manufacturer and extended up the sidewalls of the excavation with a minimum of 5 feet of extra material above the excavation bottom. The fabric/geogrid should be rolled out along the long dimension of the excavation.

3. A minimum of 18 inches of compacted virgin Class 2 AB per Section 26 of the Caltrans Standard Specifications (2022a) should be placed over the fabric/geogrid throughout the entire excavation. The AB should be placed in at least two moisture conditioned and compacted lifts, where the first lift above the fabric/geogrid should be placed by end-dumping and spreading ahead of the earthmoving equipment. No equipment should be allowed to travel over the fabric until at least 8 inches of AB has been placed over it. The first lift of AB over the fabric and geogrid should be compacted using heavy rubber-tired equipment; subsequent lifts of fill may be compacted using static or vibratory sheepsfoot compactors.

4. Following placement of the minimum 18 inches of compacted AB, the fabric that was extended up the sidewalls should be pulled over the top of the compacted AB and stretched as tightly as practicable. A layer of geogrid (Tensar Triax TX7 or equivalent) should then be placed over the top of the stretched fabric and compacted AB with a minimum of 3 feet of overlap between the geogrid and lower fabric/geogrid layer and secured in place per the manufacturer.

5. Following placement of the geogrid, an additional 18 inches of compacted AB should be placed over the geogrid in thin, moisture conditioned and compacted lifts. Nonexpansive fill consisting of site soils or imported nonexpansive fill should be placed, moisture conditioned and compacted above the final layer of AB to finish pad grade or to the bottom of the basin.

6. All utility lines below the proposed structures should be placed in the zone of compacted backfill above the top layer of geotextile/geogrid. If utility lines must penetrate the fabric/geogrid, the fabric/geogrid should be removed and replaced per the manufacturer's recommendations.

Upper Improvement Area

1. To reduce the magnitude of potential static and seismic differential settlements , the proposed structures in the upper improvement area should be supported on reinforced concrete mat foundations. These areas are within Overexcavation #4 in Figure 2.

2. Following site preparation, the existing soils within the building areas should be removed to a level plane at a minimum of 5 feet below finished grade for at-grade structures (operations building, sludge dewatering system, etc) and to a minimum of 3 feet below bottom of foundation depth for below grade structures (headworks). The resulting surfaces should then be scarified, moisture conditioned and recompacted. Site soils or imported nonexpansive materials should then be placed in moisture conditioned and compacted lifts to finish pad grade.

Fill Slopes

1. Following site preparation, where fill will be placed on slopes that exceed a gradient of 5:1 (horizontal: vertical), such as for the slope adjacent and west of the storm water retention basin, a keyway should be constructed at the toe of the fill. The keyway should penetrate a minimum of 2 feet vertically into alluvial soils measured at the toe, as determined by the geotechnical engineer during construction. The keyway should have a minimum width of 10 feet and should be angled slightly into the slope. A drain should be constructed at the back of the keyway. Subsequent benches should be cut into the existing slope with a minimum width of 10 feet so as to remove a minimum of the upper three feet of soil and all existing fill. A second drain should be constructed at the back of the first bench and every other bench thereafter. Typical bench and keyway and back drain details are included in Appendix F.

2. The keyway and benches should then be backfilled in moisture conditioned and compacted lifts to grades where the slopes are overbuilt such that the slopes can be cut to finish grade.

Vehicle Pavement Areas

1. Following site preparation, vehicular pavement areas should be cut to subgrade elevation. The exposed surfaces should then be scarified, moisture conditioned and recompacted. If fill is required to achieve subgrade elevation, existing grades should be scarified, moisture conditioned and recompacted prior to placing fill in moisture conditioned and compacted lifts to subgrade elevation.

General

1. Voids created by dislodging rocks and/or debris during scarification should be backfilled and replaced with appropriate fill material, including imported nonexpansive fill, and the dislodged materials should be removed from the work area.

2. Nonexpansive materials are defined as soils (imported or derived from selective site grading) that fall in the GW, GM, GC, SP, SW, SC and SM categories per ASTM D 2487-17, and that have an expansion index of 10 or less (ASTM D 4829-21).

3. It may be difficult to achieve stability if the soils being compacted have well above optimum moisture contents. In those cases, it may be necessary to dry the soils through scarification or mixing with dry soil in order to achieve stable conditions. Other options to achieve stable conditions may include replacement of unstable soil with gravel or Class 2 AB and potentially stabilization fabric or geogrid. Detailed stabilization recommendations may be provided, if requested, upon examination of actual field conditions by the Geotechnical Engineer.

4. The recommended soil moisture content should be maintained throughout construction. Failure to maintain the recommended soil moisture content can result in development of cracks and disturbance, which are an indication of degradation of the degree of soil compaction. If cracks are allowed to develop, or if soils near improvements such as foundations, flatwork, pavement, curbs, etc. are otherwise disturbed, damage to those improvements may result. Soils that have been or are otherwise disturbed should be removed, moisture conditioned, and compacted.

5. Permanent cut and fill slopes should not be steeper than a 2:1 (horizontal:vertical) gradient, unless otherwise recommended by the geotechnical engineer.

Utility Trenches

1. Utility trenches adjacent to foundations should not be excavated within the zone of foundation influence, as shown in Typical Detail A in Appendix F.

2. Utilities should be designed with flexible connections to accommodate differential settlement between the improved and unimproved areas in both the upper and lower improvement areas.

3. Utilities that must pass beneath foundations should be placed with properly compacted utility trench backfill and the foundation should be designed to span the trench.

4. A select, noncorrosive, easily compacted sand should be used as bedding and shading immediately around utilities. Above the select material, trench backfill should match the materials and sections surrounding the trenches.

5. Prior to applying compactive effort, soils should be moisture conditioned. Trench backfill should be placed in level lifts not exceeding 6 inches in loose thickness prior to compaction.

6. Compaction of trench backfill by jetting or flooding is not recommended at this site. However, to aid in *encasing* utility conduits, particularly corrugated drainpipes, and multiple, closely spaced conduits in a single trench with the bedding and shading material, jetting or flooding may be useful. Flooding or jetting should only be attempted with extreme caution, and any flooding or jetting operation should be subject to review by the geotechnical engineer.

7. Long-term settlement of properly compacted site and imported nonexpansive materials should be assumed to be about 0.25 to 0.5 percent of the depth of the backfill. Improvements that are constructed over or near trenches should be designed to accommodate the potential for settlement.

8. The architect/engineer should incorporate appropriate measures in the design of the utility systems to mitigate the low potential for radon accumulation.

9. The recommendations of this section are minimums only and may be superseded by the architect/engineer based upon soil corrosivity or the requirements of pipe manufacturers, utility companies or the governing jurisdiction.

Foundations

1. Due to the potential for liquefaction-induced settlement, the proposed structures should be constructed on reinforced concrete mat foundations that are supported by soil reinforced per the “Grading” Section of this report.

2. The mat foundations can have a uniform thickness, or they can consist of variable thickness slabs and grade beams (i.e., a “waffle slab”). Mat edges supporting at-grade

structures should have a minimum depth of 15 inches below lowest adjacent grade. The mat foundations should be reinforced in accordance with the requirements of the architect/engineer and should contain minimum rebar meeting the criteria of ACI 318, Section 24.4 (ACI 2014).

3. The mats should be designed for maximum allowable dead plus live areal bearing pressures of 2,000 psf. Using these criteria, total and differential settlements under static conditions are not expected to exceed 0.5 inch and 0.25 inch over a horizontal distance of 25 feet, respectively.

4. With the recommended soil reinforcement program successfully completed in combination with mat foundations for the improvements within the lower improvement/basin areas, we anticipate seismic settlement will be as high as 3.5 inches, with corresponding differential seismic settlements on the order of 2 inches over a horizontal distance of 25 feet. Combined (static plus seismic) total and differential settlement would therefore be on the order of 4 inches and 2.25 inches, respectively. If the above estimates are not acceptable for the proposed structures, ground improvement or deep foundations may be required.

5. With the recommended overexcavation program successfully completed in combination with mat foundations for the improvements within the upper improvement area, we anticipate seismic settlement will be reduced to approximately 0.5 inch, with corresponding differential seismic settlements on the order of 0.25 inch over a horizontal distance of 25 feet. Combined (static plus seismic) total and differential settlement would therefore be on the order of 1 inch and 0.5 inch, respectively.

6. The allowable bearing capacity may be increased by one-third when transient loads such as wind or seismicity are included. Foundations should be designed using the site design response parameters contained in the table in the “Seismicity” Section of this report.

7. To calculate resistance to lateral loads, an ultimate passive equivalent fluid pressure of 350 psf and a coefficient of friction of 0.40 may be used. Lateral capacity is based on the assumption that any backfill adjacent to foundations has been properly compacted. Passive and friction components of resistance may be combined in the analysis without reduction to either value. An appropriate factor of safety should be applied to the values presented above.

8. A preliminary static soil modulus of subgrade reaction of 15 pci should be used by the structural engineer to perform the initial Structural Analysis by Finite Elements (SAFE), or similar. Once we receive the SAFE-type output from the structural engineer, we can provide equal subgrade modulus contours across the mat area so that the structural engineer can determine the type and amount of reinforcement needed, if desired.

9. Foundation excavations should be observed by the geotechnical engineer prior to placement of reinforcing steel. Foundation excavations should be moistened, and no desiccation cracks should be present prior to concrete placement.

Moisture Vapor Transmission

1. Due to the current use of impermeable floor coverings, water-soluble flooring adhesives, and the speed at which buildings are now constructed, moisture vapor transmission through slabs is a much more common problem than in past years. Where moisture vapor transmitted from the underlying soil would be undesirable, the slabs should be protected from subsurface moisture vapor. A number of options for vapor protection are discussed below; however, the means of vapor protection, including the type and thickness of the vapor retarder, if specified, are left to the discretion of the architect/engineer.

2. Where specified, vapor retarders should conform to ASTM Standard E1745-17. This standard specifies properties for three performance classes, Class “A”, “B” and “C”. The appropriate class should be selected based on the potential for damage to the vapor retarder during its installation and placement of slab reinforcement and concrete. Unless it is determined that a permeance of 0.10 perms will not allow vapor to accumulate beneath moisture-sensitive flooring, adhesives, stored products and/or equipment, then a vapor retarder permeance of 0.010 perms is recommended, per ACI 302.1-15 (ACI 2015). Permeance of vapor retarders should remain below 0.10 perms after the conditioning tests of ASTM E 1745-17. It should be noted that ASTM E 1745-17 has the same permeance threshold for Class A through Class C (0.1 perms). The class that is chosen will make a difference in how resistant the vapor retarder is to punctures and tears, but it will not insure any better permeance values to protect floor coverings.

3. Several recent studies, including those of ACI Committee 302 (ACI 2015), have concluded that excess water above the vapor retarder increases the potential for moisture damage to floor coverings and could increase the potential for mold growth or other microbial

contamination. The studies also concluded that it is preferable to eliminate the typical sand layer beneath the slab and place the slab PCC in direct contact with a vapor retarder, particularly during wet weather construction. However, placing the PCC directly on the vapor retarder requires special attention to specifying the proper vapor retarder, a very low water-cement ratio in the PCC mix, and special finishing and curing techniques.

4. Another option for vapor protection would be the use of vapor-inhibiting admixtures in the slab PCC mix and/or application of a sealer to the surface of the slab. This would also require special PCC mixes and placement procedures, depending upon the recommendations of the admixture or sealer manufacturer.

5. A third option that may be a reasonable compromise between effectiveness and cost considerations would be the use of a subslab vapor retarder protected by a layer of granular material or of clean sand, with the granular material being the preferred choice. The granular material should be easily compactible and have a relatively low fines content and a low wicking potential; virgin Class 2 AB (Caltrans 2022a) meets these criteria. Clean sand is defined as a well or poorly graded sand (ASTM D2487-17) of which less than 3 percent passes the No. 200 sieve. The retarder should be covered with a minimum 4 inches of granular material or clean sand. If a Class “A” vapor retarder is specified, the retarder can be placed directly on the compacted soil material. If a less durable vapor retarder is specified (Class “B” or “C”), a minimum of 1 inch of fine-graded material such as a clean sand should be placed over the compacted soil material to reduce the chance of puncturing the vapor retarder.

6. If sand is used between the vapor retarder and the slab, it should be moistened only as necessary to promote concrete curing; saturation of the sand should be avoided, as the excess moisture would be on top of the vapor retarder, potentially resulting in vapor transmission through the slab for months or years.

7. Regardless of the underslab vapor retarder selected, proper installation of the retarder is critical for optimum performance. Where utilized, the vapor retarder should be placed a minimum of 1 inch above the flow line of the drainage path surrounding the structures, or 1 inch above the area drain grates if area drains are used to collect runoff around the structures. All seams must be properly lapped, and all seams and utility penetrations properly sealed in accordance with the vapor retarder manufacturer’s recommendations

and ASTM E1643-18a. At the terminating edges of the vapor retarder, the vapor retarder should be effectively sealed with accessories specifically designed to seal the material to new or existing concrete; details for edge sealing of the vapor retarder should be provided by the architect/engineer.

Retaining Walls

1. Retaining walls will be required for below-grade structures, such as the pump stations and headworks vault. The walls should be supported by the mat foundations proposed for these structures.

2. Retaining walls for the below-grade structures will likely be designed as fixed walls; therefore, at-rest pressures should be provided, and should be 55 pcf for site soils and 50 pcf for imported nonexpansive materials. No surcharges are taken into consideration in the values presented above.

3. The upper foot of backfill behind all retaining walls should consist of native soil, except in areas where surface improvements will abut the top of the wall. In such cases, the backfill should extend to the nonexpansive material, sand, AB or other material below the improved surface, as appropriate. If gravel backfill is utilized, the gravel should be encased in a permeable synthetic filter fabric conforming to standard specification section 96-1.02B – Class C (Caltrans 2022a).

4. If the active or at-rest pressures presented in the table above for imported sand or gravel are used, the sand or gravel backfill should be used exclusively above a 1:1 plane extending from the bottom of the footing to daylight. To reduce the potential for surface drainage to enter the wall backfill, the upper foot should be backfilled with native soil. If gravel backfill is utilized, the gravel should be encased in a permeable, synthetic filter fabric conforming to Standard Specifications Section 96-1.02B-b - Class C (Caltrans 2022a).

5. The pressures presented above are applicable to a horizontal retained surface behind the wall. Walls having a retained surface that slopes upward from the wall should be designed for an additional equivalent fluid pressure of 1.5 pcf for every two degrees of slope inclination.

6. Recent research by Al Atik and Sitar (2010) confirmed that for flexible (cantilevered) walls, particularly those over 12 feet tall, an increase in soil pressure does occur under

significant seismic accelerations. Further, they found that the increase is due to the out-of-phase interaction between the soil and the flexible wall. When considering rigid walls (i.e. those designed using at-rest criteria); however, they found that the incremental increase due to seismicity was typically less than 50 percent of the static wall pressure. Consequently, no incremental increase in lateral soil pressure is recommended for the design of walls where the static design utilizes the at-rest equivalent fluid pressure and they are designed with factors of safety and earth load factors of at least 1.5.

7. In typical structural design methods for retaining walls such as those found in Section 1605 of the 2022 CBC, lateral soil pressure is multiplied by a load factor of 1.6. According to Lew et al. (2010), a load factor of 1.6 is too conservative for seismic loads; this paper suggests that the seismic increase in lateral pressure be separated from the static active pressure and that a load factor of 1.0 be used for the seismic increase. Further, Al Atik and Sitar (2010) found that pressure increases due to seismic earth loads were minimal for walls retaining less than 12 feet of backfill. While Al Atik and Sitar's research is generally accepted among geotechnical and structural engineers in California, it is not entirely acknowledged by the CBC, as the CBC sets the height below which seismic loads may be ignored at 6 feet. Given this disparity, it is suggested that caution be used not to over-engineer walls retaining between 6 and 12 feet of backfill.

8. Long-term settlement of properly compacted imported sand/gravel and site soil for retaining wall backfill should be assumed to be about 0.25 and 0.5 percent of the depth of the backfill. Improvements that are constructed near the tops of retaining walls should be designed to accommodate long-term settlement.

9. All retaining walls should be drained with perforated pipe encased in a free-draining gravel blanket. The pipe should be placed with perforations facing downward and should discharge in a nonerosive manner away from foundations and other improvements. The gravel blanket should have a width of approximately 1 foot and should extend upward to approximately 1 foot from the top of the wall backfill. The upper foot should be backfilled with native site soil, except in areas where surface improvements will abut the top of the wall. In such cases, the gravel should extend to the imported nonexpansive material, sand, AB, or other material below the improved surface, as appropriate. To reduce infiltration of the soil into the gravel, a permeable synthetic filter fabric conforming to Standard Specifications Section 96-1.02B – Class C (Caltrans 2022a), should be placed between the

two. Manufactured synthetic drains, such as Miradrain or Enkadrain are acceptable alternatives to the use of gravel, provided that they are installed in accordance with the recommendations of the manufacturer.

10. Where weep hole drainage can be properly discharged, the perforated pipe may be omitted in lieu of weep holes on maximum 4-foot centers. A filter fabric as described above should be placed between the weep holes and the drain gravel.

11. Where wall drainage cannot be included in the wall design, an additional lateral pressure increment of 40 pcf resulting from hydrostatic pressure should be added to the wall lateral earth pressures.

12. Walls facing areas where moisture transmission through the wall would be undesirable should be thoroughly waterproofed in accordance with the specifications of the architect/engineer.

13. The architect/engineer should bear in mind that retaining walls by their nature are flexible structures, and that surface treatments on walls often crack. Where walls are to be plastered or otherwise have a finish applied, the flexibility should be considered in determining the suitability of the surfacing material, spacing of horizontal and vertical control joints, etc. The flexibility should also be considered where a retaining wall will abut or be connected to a rigid structure, and where the geometry of the wall is such that its flexibility will vary along its length.

Vehicle Pavement Sections

HMA Pavement

1. A tested R-value, or resistance to deformation under repeated loading, of 46 was used for our analysis. The following HMA pavement sections are based upon the assumed R-value and assumed Traffic Indices (TIs) of 4.0 through 7.0. Determination of the appropriate TI for specific areas of the project is left to others. The HMA sections were calculated in accordance with the method presented in the “Highway Design Manual” (Caltrans 2022b). The calculated HMA and Class 2 AB thicknesses are for compacted material. Normal Caltrans construction tolerances should apply.

TABLE 2: HMA Pavement Sections

Traffic Index	HMA* (in)	Class 2 AB** (in)
4.0	2.25	4.0
4.5	2.50	4.0
5.0	2.75	4.5
5.5	3.00	5.0
6.0	3.25	5.5
6.5	3.75	6.0
7.0	4.00	7.0

*Per Caltrans (2022a) Section 39
**Per Caltrans (2022a) Section 26

<u>PCC Pavement</u>

1. If unreinforced Portland cement concrete pavement is planned, the following minimum section is recommended:
    - 8 inches plain PCC (4,000 psi minimum compressive strength)
    - Joint spacing at 10 to 12 feet on-center each way
    - No. 4 smooth joint dowels at 12-inch centers
    - 12 inches Class 2 AB and subgrade compacted to a minimum of 95 percent of maximum dry density

2. If reinforced concrete pavement is planned, the following minimum section may be used:
    - 6 inches PCC (4,000 psi minimum compressive strength)
    - Joint spacing at 10 to 12 feet on-center each way
    - No. 4 rebar at 18-inch centers each way
    - No. 4 smooth joint dowels at 18-inch centers
    - 12 inches Class 2 AB and subgrade compacted to a minimum of 95 percent of maximum dry density

3. Section design for trash enclosures and similar PCC pavement should follow the minimum recommendations presented above.

Pavement Sections - General

1. HMA and PCC pavement should be constrained by curbs, gutters, flatwork, walls, etc.; free edges to the pavement should be avoided.

2. HMA and PCC pavement should be set back a minimum of 5 feet from any descending slope. Alternately, deepened curbs may be used to constrain the pavement. Where curbs will be deepened in lieu of the recommended setback, the individual situation should be reviewed and specific recommendations prepared by the geotechnical engineer.

3. Subgrade and AB should be firm and unyielding when proof-rolled with heavy, rubber-tired grading equipment prior to continuing construction.

4. Finished pavement surfaces should be sloped to freely drain toward appropriate drainage facilities. Water should not be allowed to stand or pond on or adjacent to pavement, as it could cause premature pavement deterioration or improvement damage.

5. To reduce migration of surface drainage into the subgrade, maintenance of pavement areas is critical. Any cracks that develop in the pavement should be promptly sealed.

6. The local jurisdiction may have additional requirements for pavement that could take precedence over the above recommendations.

Drainage and Maintenance

1. Per Section 1804.4 of the 2022 CBC, unpaved ground surfaces should be *finish graded* to direct surface runoff away from foundations and other improvements at a minimum 5 percent grade for a minimum distance of 10 feet. The site should be similarly sloped to drain away from foundations and other improvements during construction. Where this is not practicable due to other improvements, etc., swales with improved surfaces, area drains, or other drainage facilities should be used to collect and discharge runoff.

2. All eaves of the structures should be fitted with roof gutters. Runoff from vehicular pavements, roof gutters, downspouts, planter drains, area drains, etc. should discharge in a nonerosive manner away from foundations, slopes, and other improvements in accordance with the requirements of the governing agencies. Erosion protection should be placed at all discharge points unless the discharge is to a pavement surface.

3. Raised planter boxes adjacent to foundations should be installed with drains and sealed sides and bottoms. Drains should also be provided for areas adjacent to the structure and in landscape areas that would not otherwise freely drain.

4. Stabilization of soils disturbed during construction by vegetation or other means *during* and *following* construction, is essential to reduce erosion damage. Care should be taken to establish and maintain vegetation. The landscaping should be planned and installed to maintain the surface drainage recommended above. Surface drainage should also be maintained during construction.

5. Maintenance of drainage and other improvements is critical to the long-term stability of the site and the integrity of the structures. Site improvements should be maintained on a regular basis.

6. All exterior drains, retaining wall drains, and drain outlets should be maintained to be free flowing. Care should be taken to establish and maintain vegetation. Vegetation and erosion matting (if utilized) should be maintained or augmented as needed. Irrigation systems should be maintained so that soils around structures are maintained at a relatively uniform year-round moisture content and are neither over-watered nor allowed to dry and desiccate.

7. To reduce the potential for disruption of drainage patterns and undermining of structures, fill areas, etc., all rodent activity should be aggressively controlled.

8. The architect/engineer should incorporate appropriate measures in the design of drainage systems as needed, to mitigate the low potential for radon accumulation.

Observation and Testing

1. It must be recognized that the recommendations contained in this report are based on a limited number of borings and rely on continuity of the subsurface conditions encountered.

2. It is assumed that the geotechnical engineer will be retained to provide consultation during the design phase, to interpret this report during construction, and to provide construction monitoring in the form of testing and observation.

3. At a minimum, the geotechnical engineer should be retained to provide:
    - Professional observation during grading, trench and retaining wall backfill, and foundation construction
    - Oversight of special inspection and compaction testing during grading, trench and retaining wall backfill, and foundation construction

4. Special inspection of grading and backfill should be provided as per Section 1705.6 and Table 1705.6 of the 2022 CBC. The special inspector should be under the direction of the geotechnical engineer. At a minimum, the following items should be inspected and/or tested by the special inspector:
    - Stripping and clearing of all existing improvements, vegetation, and deleterious materials
    - Overexcavation to the recommended depths
    - Moisture conditioning and compaction of site soils prior to fill placement
    - Fill quality, soil reinforcement and fill placement, moisture conditioning and compaction
    - Utility trench backfill
    - Building foundation excavations
    - Retaining wall foundation excavations, drain placement and backfill
    - Vehicle pavement subgrade and AB compaction and proof-rolling

5. A program of quality assurance should be developed prior to beginning construction. At a minimum, the program should include all geotechnical items shown on the testing and inspection schedule of the approved plans. It should also include any additional inspection items required by the engineer and/or the governing jurisdiction. These items should be discussed at a preconstruction site meeting among a representative of the owner, the geotechnical engineer, special inspector, the project inspector, the engineer, and contractors. The geotechnical engineer should be notified at least 48 hours prior to beginning grading operations.

6. Locations and frequency of compaction tests should be as per the recommendations of the geotechnical engineer at the time of construction. The recommended test location

and frequency may be subject to modification by the geotechnical engineer, based upon soil and moisture conditions encountered, size and type of equipment used by the contractor, the general trend of the results of compaction tests, or other factors.

12.0 CLOSURE

Our intent was to perform the investigation in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing in the locality of this project under similar conditions. No representation, warranty, or guarantee is either expressed or implied. This report is intended for the exclusive use by the client as discussed in the "Scope of Services" Section. Application beyond the stated intent is strictly at the user's risk.

This report is valid for conditions as they exist at this time for the type of project described herein. The conclusions and recommendations contained in this report could be rendered invalid, either in whole or in part, due to changes in building codes, regulations, standards of geotechnical or construction practice, changes in physical conditions, or the broadening of knowledge.

If changes with respect to the project become necessary, if items not addressed in this report are incorporated into plans, or if any of the assumptions used in the preparation of this report are not correct, this firm shall be notified for modifications to this report. Any items not specifically addressed in this report should comply with the CBC of other applicable standards, and the requirements of the governing jurisdiction.

The preliminary recommendations presented in this geotechnical report are based upon the geotechnical conditions encountered at the site and may be augmented by additional requirements of the client, or by additional recommendations provided by the geotechnical engineer based on peer or jurisdiction reviews, or conditions exposed at the time of construction.

This document, the data, conclusions, and recommendations contained herein are the property of Earth Systems Pacific. This report shall be used in its entirety, with no individual sections reproduced or used out of context. Copies may be made only by Earth Systems Pacific, the client, and the client's authorized agents for use exclusively on the subject project. Any other use is subject to federal copyright laws and the written approval of Earth Systems Pacific.

Thank you for this opportunity to have been of service. If you have any questions, please feel free to contact this office at your convenience.

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APPENDIX A

Figure 1 – Site Vicinity Map

Figure 2 – Exploration Location and Overexcavation Areas Map

CPT Data

Boring Log Legend

Boring Logs

N

BASE MAP PROVIDED BY: GOOGLE EARTH (2023)

NOT TO SCALE

Earth Systems Pacific
4378 Old Santa Fe Road, San Luis Obispo, CA 93401
www.earthsystems.com
(805) 544-3276 • Fax (805) 544-1786

SITE VICINITY MAP

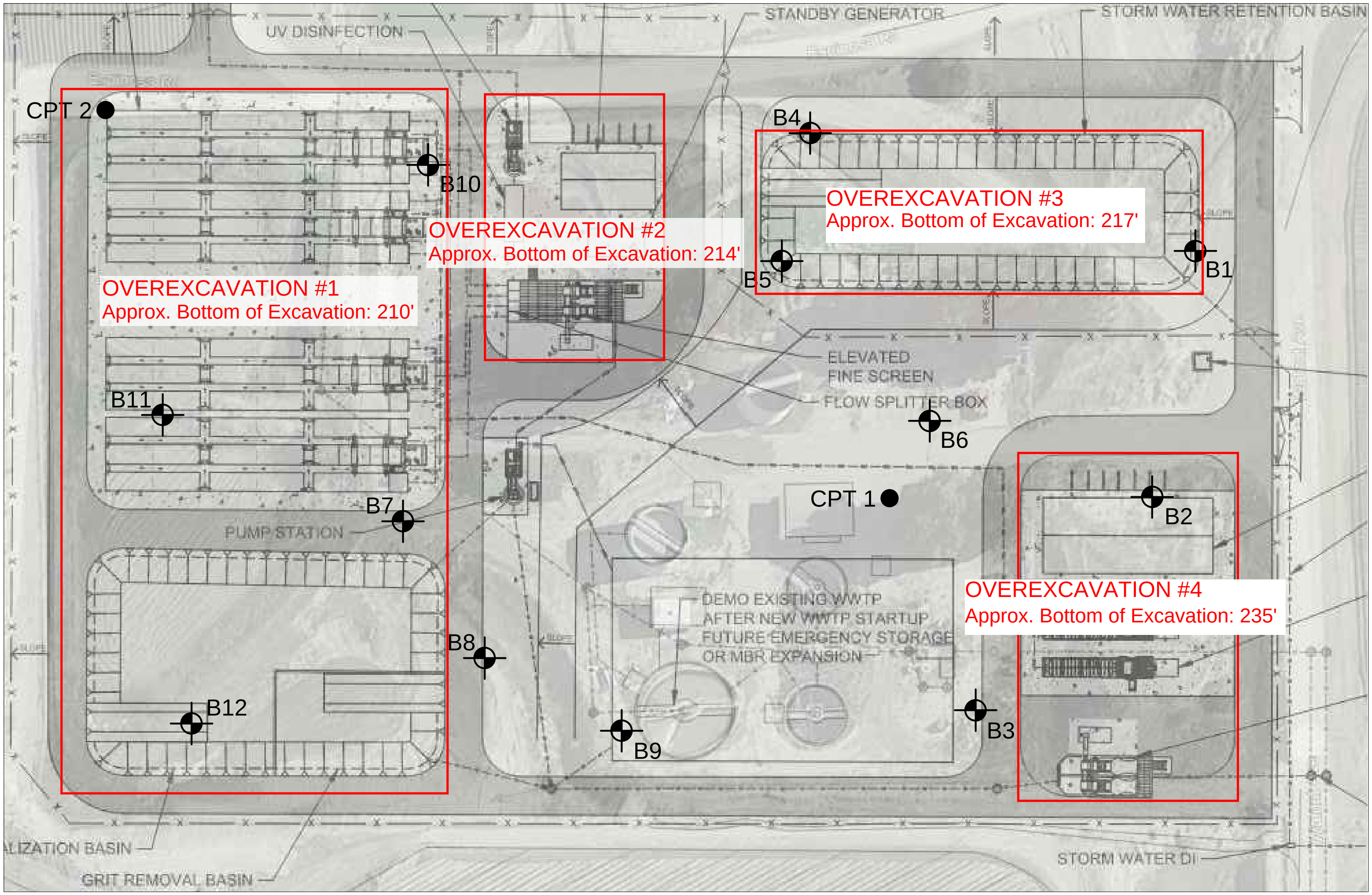
Greenfield Wastewater Treatment Plant Upgrades
41901 Walnut Avenue
Greenfield, California

Date
March 2023

Project No.
305748-001

Figure 1

305748–001 GreenfieldWWTPUpgrade02242023maps.dwg



LEGEND

B12 ⌖	Boring Location (Approx.)
CPT 2 ●	Cone Penetration Test Location (Approx.)

BASE MAP PROVIDED BY: GOOGLE EARTH (2023)
SITE PLAN PROVIDED BY: HYDROSCIENCE ENGINEERS (Undated)

N

NOT TO SCALE

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4378 Old Santa Fe Road, San Luis Obispo, CA 93401
www.earthsystems.com
(805) 544-3276 • Fax (805) 544-1786

EXPLORATION LOCATION AND OVEREXCAVATION AREAS MAP

Greenfield Wastewater Treatment Plant Upgrades
41901 Walnut Avenue
Greenfield, California

Date
March 2023

Project No.
305748-001

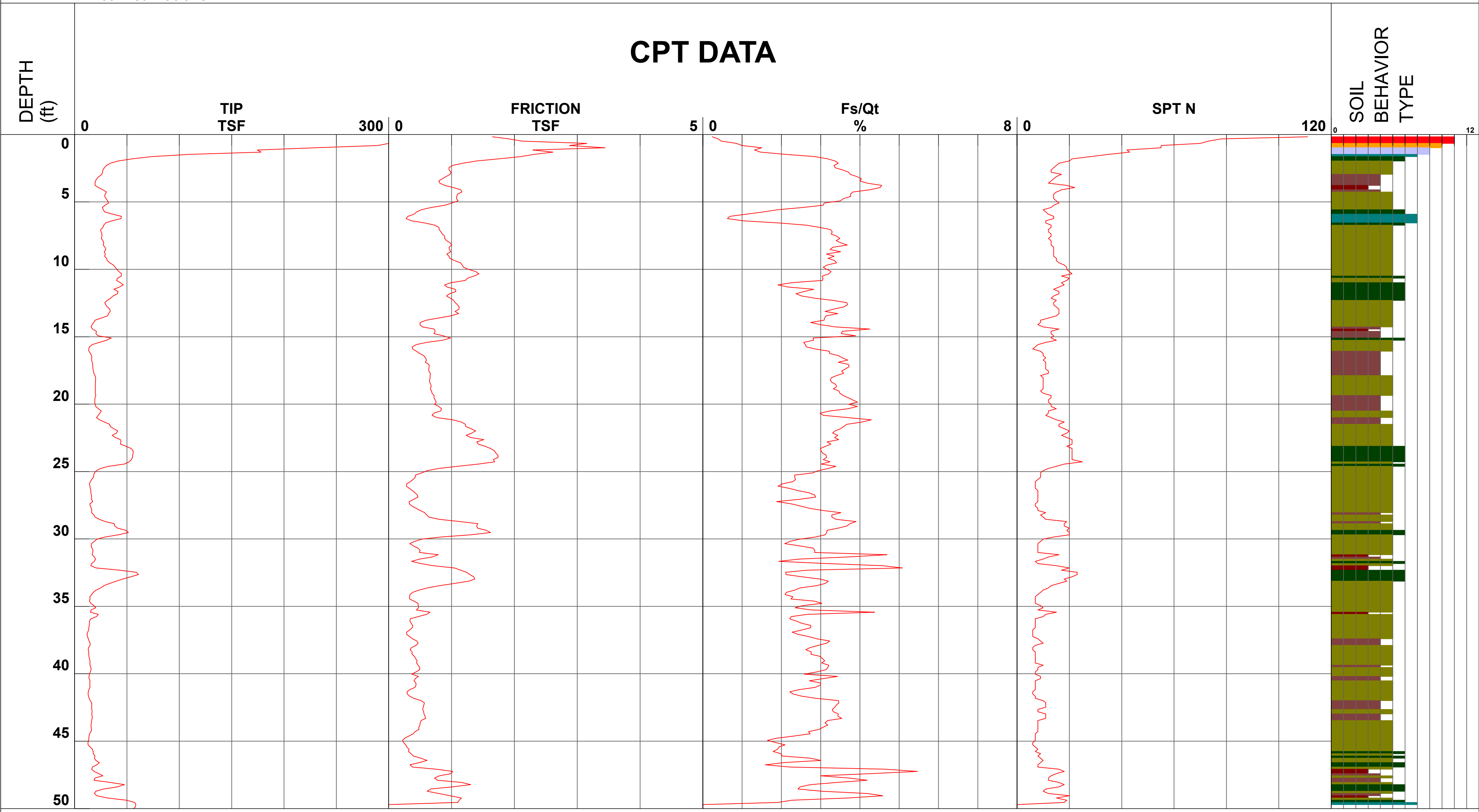
Figure 2

305748-001 GreenfieldWWTPUpgrade02242023maps.dwg

Earth Systems

Project Greenfield Wastewater Treatment Plant upg
Job Number 305603-001
Hole Number CPT-01
EST GW Depth During Test 25.00 ft
Operator AJ-BH
Cone Number DDG1587
Date and Time 12/7/2022 12:42:30 PM
Filename SDF(377).cpt
GPS
Maximum Depth 50.03 ft

Net Area Ratio .8



- ⬜ 1 - sensitive fine grained
- ⬛ 2 - organic material
- 🟥 3 - clay
- 🟫 4 - silty clay to clay
- 🟨 5 - clayey silt to silty clay
- 🟩 6 - sandy silt to clayey silt
- 🟦 7 - silty sand to sandy silt
- 🟪 8 - sand to silty sand
- 🟧 9 - sand
- 🟥 10 - gravelly sand to sand
- 🟦 11 - very stiff fine grained (*)
- 🟦 12 - sand to clayey sand (*)

Cone Size 15cm squared

S*Soil behavior type and SPT based on data from UBC-1983

Earth Systems

Middle Earth GEO TESTING INC.

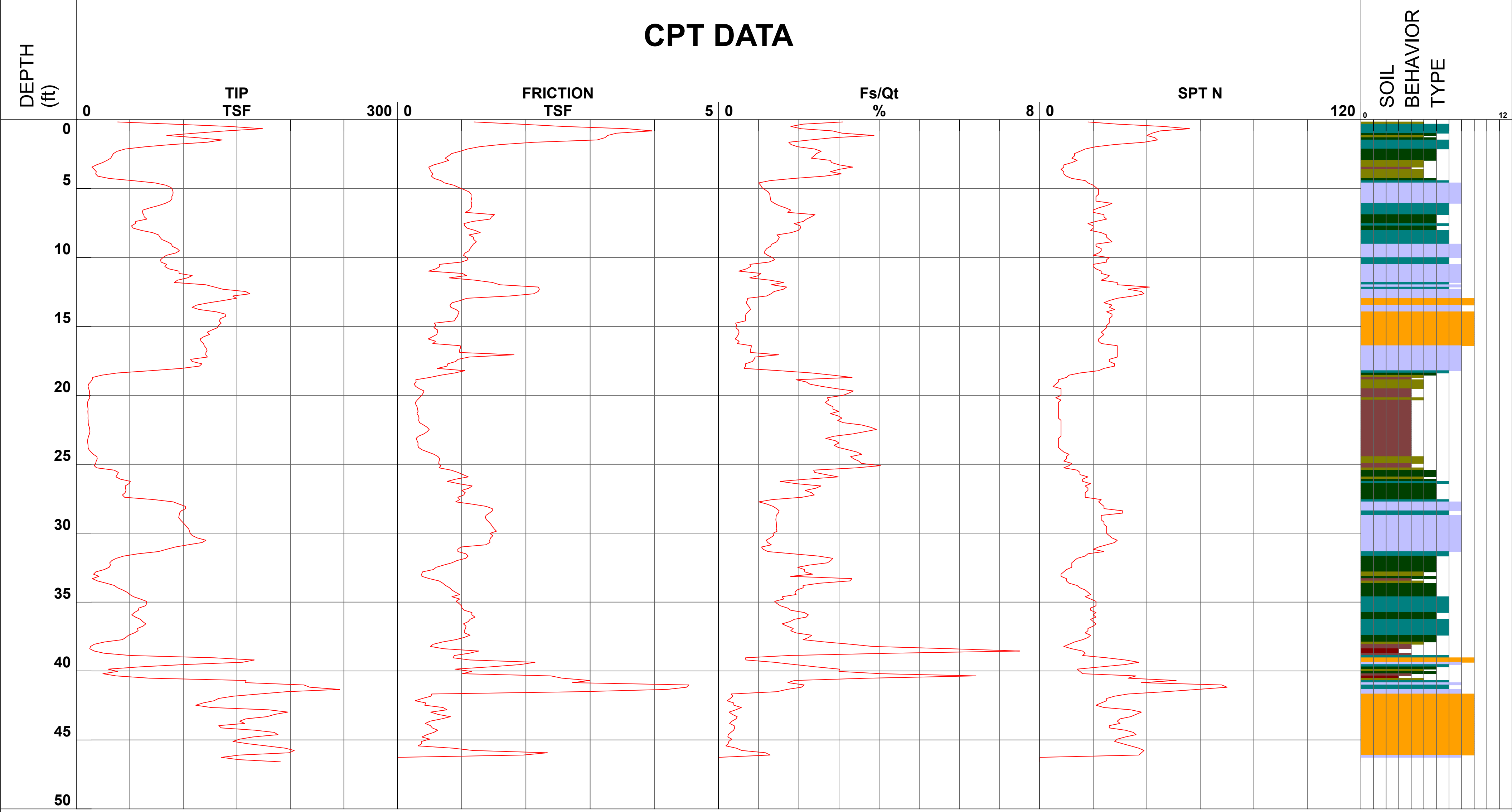
Project Greenfield Wastewater Treatment Plant upg
Job Number 305603-001
Hole Number CPT-02A
EST GW Depth During Test 25.00 ft

Operator AJ-BH
Cone Number DDG1587
Date and Time 12/7/2022 1:58:43 PM

Filename SDF(379).cpt
GPS
Maximum Depth 46.59 ft

Net Area Ratio .8

CPT DATA



■ 1 - sensitive fine grained
■ 2 - organic material
■ 3 - clay
■ 4 - silty clay to clay
■ 5 - clayey silt to silty clay
■ 6 - sandy silt to clayey silt
■ 7 - silty sand to sandy silt
■ 8 - sand to silty sand
■ 9 - sand
■ 10 - gravelly sand to sand
■ 11 - very stiff fine grained (*)
■ 12 - sand to clayey sand (*)

Cone Size 15cm squared

S*Soil behavior type and SPT based on data from UBC-1983

Earth Systems Pacific

BORING LOG LEGEND

SAMPLE / SUBSURFACE WATER SYMBOLS	GRAPH. SYMBOL
CALIFORNIA MODIFIED	▬
STANDARD PENETRATION TEST (SPT)	●
SHELBY TUBE	▭
BULK	○
SUBSURFACE WATER DURING DRILLING	▼
SUBSURFACE WATER AFTER DRILLING	▽

UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D 2487)

MAJOR DIVISIONS		GROUP SYMBOL	TYPICAL DESCRIPTIONS	GRAPH. SYMBOL
COARSE GRAINED SOILS	MORE THAN HALF OF MATERIAL IS LARGER THAN #200 SIEVE SIZE	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	○
		GP	POORLY GRADED GRAVELS, OR GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	⬡
		GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES, NON-PLASTIC FINES	⬡
		GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES, PLASTIC FINES	⬡
		SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	░
		SP	POORLY GRADED SANDS OR GRAVELLY SANDS, LITTLE OR NO FINES	░
		SM	SILTY SANDS, SAND-SILT MIXTURES, NON-PLASTIC FINES	▥
		SC	CLAYEY SANDS, SAND-CLAY MIXTURES, PLASTIC FINES	▨
FINE GRAINED SOILS	HALF OR MORE OF MATERIAL IS SMALLER THAN #200 SIEVE SIZE	ML	INORGANIC SILTS AND VERY FINE SANDS, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY	▥
		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS	▨
		OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	▤
		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS	▥
		CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	▨
		OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS	▤
		PT	PEAT AND OTHER HIGHLY ORGANIC SOILS	▽

OBSERVED MOISTURE CONDITION

DRY	SLIGHTLY MOIST	MOIST	VERY MOIST	WET (SATURATED)

CONSISTENCY

COARSE GRAINED SOILS			FINE GRAINED SOILS		
BLOWS/FOOT		DESCRIPTIVE TERM	BLOWS/FOOT		DESCRIPTIVE TERM
SPT	CA SAMPLER		SPT	CA SAMPLER	
0-10	0-16	LOOSE	0-2	0-3	VERY SOFT
11-30	17-50	MEDIUM DENSE	3-4	4-7	SOFT
31-50	51-83	DENSE	5-8	8-13	MEDIUM STIFF
OVER 50	OVER 83	VERY DENSE	9-15	14-25	STIFF
			16-30	26-50	VERY STIFF
			OVER 30	OVER 50	HARD

GRAIN SIZES

U.S. STANDARD SERIES SIEVE				CLEAR SQUARE SIEVE OPENING		
# 200	# 40	# 10	# 4	3/4"	3"	12"

SILT & CLAY	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		

TYPICAL BEDROCK HARDNESS

MAJOR DIVISIONS	TYPICAL DESCRIPTIONS
EXTREMELY HARD	CORE, FRAGMENT, OR EXPOSURE CANNOT BE SCRATCHED WITH KNIFE OR SHARP PICK; CAN ONLY BE CHIPPED WITH REPEATED HEAVY HAMMER BLOWS
VERY HARD	CANNOT BE SCRATCHED WITH KNIFE OR SHARP PICK; CORE OR FRAGMENT BREAKS WITH REPEATED HEAVY HAMMER BLOWS
HARD	CAN BE SCRATCHED WITH KNIFE OR SHARP PICK WITH DIFFICULTY (HEAVY PRESSURE); HEAVY HAMMER BLOW REQUIRED TO BREAK SPECIMEN
MODERATELY HARD	CAN BE GROOVED 1/16 INCH DEEP BY KNIFE OR SHARP PICK WITH MODERATE OR HEAVY PRESSURE; CORE OR FRAGMENT BREAKS WITH LIGHT HAMMER BLOW OR HEAVY MANUAL PRESSURE
SOFT	CAN BE GROOVED OR GOUGED EASILY BY KNIFE OR SHARP PICK WITH LIGHT PRESSURE, CAN BE SCRATCHED WITH FINGERNAIL; BREAKS WITH LIGHT TO MODERATE MANUAL PRESSURE
VERY SOFT	CAN BE READILY INDENTED, GROOVED OR GOUGED WITH FINGERNAIL, OR CARVED WITH KNIFE; BREAKS WITH LIGHT MANUAL PRESSURE

TYPICAL BEDROCK WEATHERING

MAJOR DIVISIONS	TYPICAL DESCRIPTIONS
UNWEATHERED	NO DISCOLORATION, NOT OXIDIZED
SLIGHTLY WEATHERED	DISCOLORATION OR OXIDATION IS LIMITED TO SURFACE OF, OR SHORT DISTANCE FROM, FRACTURES: SOME FELDSPAR CRYSTALS ARE DULL
MODERATELY WEATHERED	DISCOLORATION OR OXIDATION EXTENDS FROM FRACTURES, USUALLY THROUGHOUT; Fe-Mg MINERALS ARE "RUSTY", FELDSPAR CRYSTALS ARE "CLOUDY"
HIGHLY WEATHERED	DISCOLORATION OR OXIDATION THROUGHOUT; FELDSPAR AND Fe-Mg MINERALS ARE ALTERED TO CLAY TO SOME EXTENT, OR CHEMICAL ALTERATION PRODUCES IN SITU DISAGGREGATION
DECOMPOSED	DISCOLORATION OR OXIDATION THROUGHOUT, BUT RESISTANT MINERALS SUCH AS QUARTZ MAY BE UNALTERED; FELDSPAR AND Fe-Mg MINERALS ARE COMPLETELY ALTERED TO CLAY

drafting/masters/Boring Log Legend 062719.dwg

Earth Systems Pacific

Boring No. 1

LOGGED BY: A. Flynn
DRILL RIG: Track Mounted Geoprobe 7822DT with Automatic Hammer
AUGER TYPE: 6" Hollow Stem

PAGE 1 OF 1
JOB NO.: 305748-001
DATE: 12/28/2022

Greenfield Wastewater Treatment Plant Upgrade
41901 Walnut Avenue
Greenfield, California

SOIL DESCRIPTION

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA				
				INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	SP		POORLY GRADED SAND: dark brown, medium dense, very moist (Alluvium)					
1			slightly moist	0.0 - 4.0	○			
4			pale brown, loose					
5				5.0 - 6.5	■	89.4	4.6	4 4 6
7	ML		SANDY SILT: pale brown with orange mottling, medium stiff, slightly moist					
10				10.0 - 11.5	■	87.6	13.2	3 5 8
15				15.0 - 16.5	■			3 4 5
17			End of Boring @ 16.5' No subsurface water encountered					

LEGEND: ■ Ring Sample ○ Grab Sample ☐ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Boring No. 2

LOGGED BY: A. Flynn
DRILL RIG: Mobile B-24 with Cathead Hammer
AUGER TYPE: 6" Hollow Stem

PAGE 1 OF 1
JOB NO.: 305748-001
DATE: 12/07/2022

Greenfield Wastewater Treatment Plant Upgrade
41901 Walnut Avenue
Greenfield, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA				
				INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	SP-SM		POORLY GRADED SAND WITH SILT: brown, loose, moist (Alluvium)	0.0 - 4.0	○			
			slightly moist					
4			pale brown	5.0 - 6.5	■	90.3	10.4	4 4 5
8	ML		SANDY SILT: pale brown, loose, moist	10.0 - 11.5	■			4 4 6
14	SM		SILTY SAND: pale brown, loose, moist	15.0 - 16.5	■			5 5 8
			End of Boring @ 16.5' No subsurface water encountered					

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Boring No. 3

LOGGED BY: A. Flynn
DRILL RIG: Mobile B-24 with Cathead Hammer
AUGER TYPE: 6" Hollow Stem

PAGE 1 OF 1
JOB NO.: 305748-001
DATE: 12/07/2022

DEPTH (feet)	USCS CLASS	SYMBOL	**Greenfield Wastewater Treatment Plant Upgrade** **41901 Walnut Avenue** **Greenfield, California** SOIL DESCRIPTION	SAMPLE DATA				
				INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	SP-SM		POORLY GRADED SAND WITH SILT: brown, loose, slightly moist, trace gravel (Alluvium)					
1				0.0 - 4.0	○			
2								
3								
4			pale brown					
5				5.0 - 6.5	■	88.1	13.9	4 3 3
6								
7								
8	SP		POORLY GRADED SAND: pale brown, loose, slightly moist					
9								
10				10.0 - 11.5	■			4 4 5
11								
12								
13								
14								
15				15.0 - 16.5	■			4 6 7
16								
17			End of Boring @ 16.5' No subsurface water encountered					
18								
19								
20								
21								
22								
23								
24								
25								
26								

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 4

LOGGED BY: A. Flynn
DRILL RIG: Mobile B-24 with Cathead Hammer
AUGER TYPE: 6" Hollow Stem

PAGE 1 OF 1
JOB NO.: 305748-001
DATE: 12/07/2022

Greenfield Wastewater Treatment Plant Upgrade
41901 Walnut Avenue
Greenfield, California

				SAMPLE DATA				
DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	SP		POORLY GRADED SAND: brown, loose, slightly moist, (Alluvium)	0.0 - 3.5	○			
3			pale brown					
5				5.0 - 6.5	▬	91.6	5.4	4 6 7
			yellowish brown					
10				10.0 - 11.5	▬	74.9	38.1	3 3 5
11	CL		SANDY LEAN CLAY: dark brown with blue mottling, medium stiff, very moist					
			blueish grey, stiff					
15				15.0 - 16.5	▬			4 6 10
16	SP		POORLY GRADED SAND: dark brown, loose, very moist					
			End of Boring @ 16.5' No subsurface water encountered					

LEGEND: ▬ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 5

LOGGED BY: A. Flynn
DRILL RIG: Track Mounted Geoprobe 7822DT with Automatic Hammer
AUGER TYPE: 6" Hollow Stem

PAGE 1 OF 2
JOB NO.: 305748-001
DATE: 12/28/2022

Greenfield Wastewater Treatment Plant Upgrade
41901 Walnut Avenue
Greenfield, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA				
				INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	SM		SILTY SAND: pale brown, loose, slightly moist (Fill)					
1				0.0 - 4.0	○			
2								
3								
4								
5				5.0 - 6.5	▬	85.4	14.0	1 2 3
6								
7								
8	SM		SILTY SAND: very light yellowish brown, loose, slightly moist (Alluvium)					
9								
10				10.0 - 11.5	▬	86.2	12.2	2 5 6
11								
12			grayish brown with bluish mottlling					
13								
14								
15				15.0 - 16.5	▬	97.5	12.5	4 7 8
16								
17								
18								
19	SC		CLAYEY SAND: dark brown, medium dense, very moist					
20				20.0 - 21.5	▬	93.2	25.6	5 7 10
21								
22								
23	CL		SANDY LEAN CLAY: dark brown, stiff, very moist					
24								
25	SC		CLAYEY SAND: dark brown, medium dense, very moist					
26								

LEGEND: ▬ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Boring No. 5

LOGGED BY: A. Flynn
DRILL RIG: Track Mounted Geoprobe 7822DT with Automatic Hammer
AUGER TYPE: 6" Hollow Stem

PAGE 2 OF 2
JOB NO.: 301565-010
DATE: 9/17/2020

Greenfield Wastewater Treatment Plant Upgrade
41901 Walnut Avenue
Greenfield, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
27	SC		CLAYEY SAND: same as above					
28	SP		POORLY GRADED SAND: yellowish brown, loose, slightly moist					
29								
30				30.0 - 31.5	▬			5 6 7
31			pale brown					
32								
33	CH		FAT CLAY WITH SAND: dark brown, stiff, very moist					
34								
35								
36								
37								
38			grayish brown with orange mottling, medium stiff					
39								
40				40.0 - 41.5	●			3 3 4
41								
42								
43								
44								
45								
46								
47								
48			stiff					
49								
50			POORLY GRADED SAND: dark brown, loose, moist	50.0 - 51.5	●			2 5 8
51	SP							
52			End of Boring @ 51.5' No subsurface water encountered					
53								

LEGEND: ▬ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 6

LOGGED BY: A. Flynn
DRILL RIG: Track Mounted Geoprobe 7822DT with Automatic Hammer
AUGER TYPE: 6" Hollow Stem

PAGE 1 OF 1
JOB NO.: 305748-001
DATE: 12/28/2022

Greenfield Wastewater Treatment Plant Upgrade
41901 Walnut Avenue
Greenfield, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	SP-SM		POORLY GRADED SAND WITH SILT: dark brown, loose, very moist (Alluvium)					
1				0.0 - 5.0	○			
2			yellowish brown					
3								
4			dark yellowish brown					
5				5.0 - 6.5	▬	86.7	12.0	4 4 6
6								
7								
8	SP		POORLY GRADED SAND: very light yellowish brown, loose, slightly moist					
9								
10				10.0 - 11.5	▬			3 3 5
11								
12								
13	ML		SANDY SILT: yellowish brown with orange and blue mottling, stiff, slightly moist					
14								
15				15.0 - 16.5	▬			4 6 13
16								
17			End of Boring @ 16.5' No subsurface water encountered					
18								
19								
20								
21								
22								
23								
24								
25								
26								

LEGEND: ▬ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Boring No. 7

LOGGED BY: A. Flynn
DRILL RIG: Mobile B-24 with Cathead Hammer
AUGER TYPE: 6" Hollow Stem

PAGE 1 OF 1
JOB NO.: 305748-001
DATE: 12/07/2022

Greenfield Wastewater Treatment Plant Upgrade
41901 Walnut Avenue
Greenfield, California

DEPTH (feet)	USCS CLASS	SOIL DESCRIPTION	INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	SP	POORLY GRADED SAND WITH SILT: brown, loose, slightly moist, (Alluvium)					
2		pale brown					
4	ML	SILT: pale brown, soft, very moist					
5			5.0 - 6.5	▬	82.5	22.7	2 2 2
8	CL	SANDY LEAN CLAY: pale brown, medium stiff, very moist					
10			10.0 - 11.5	▬			3 3 7
15			15.0 - 16.5	▬			3 4 5
		pale brown with blue gray mottling					
		End of Boring @ 16.5' No subsurface water encountered					

LEGEND: ▬ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 8

LOGGED BY: A. Flynn
DRILL RIG: Track Mounted Geoprobe 7822DT with Automatic Hammer
AUGER TYPE: 6" Hollow Stem

PAGE 1 OF 1
JOB NO.: 305748-001
DATE: 12/28/2022

Greenfield Wastewater Treatment Plant Upgrade
41901 Walnut Avenue
Greenfield, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA				
				INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	SM		SILTY SAND: dark brown, medium dense, very moist (Alluvium)					
1			yellowish brown, moist	1.0 - 5.0	○			
2								
3								
4	ML		SANDY SILT: yellowish brown, medium stiff, slightly moist					
5				5.0 - 6.5	▬	85.5	12.1	2 4 5
6								
7	SC		CLAYEY SAND: dark brown, loose, moist					
8								
9								
10				10.0 - 11.5	▬	102.1	22.2	3 6 9
11	CL		SANDY LEAN CLAY: dark brown, stiff, moist					
12								
13								
14								
15				15.0 - 16.5	▬			4 9 7
16								
17			End of Boring @ 16.5' No subsurface water encountered					
18								
19								
20								
21								
22								
23								
24								
25								
26								

LEGEND: ▬ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 9

LOGGED BY: A. Flynn
DRILL RIG: Mobile B-24 with Cathead Hammer
AUGER TYPE: 6" Hollow Stem

PAGE 1 OF 1
JOB NO.: 305748-001
DATE: 12/07/2022

Greenfield Wastewater Treatment Plant Upgrade
41901 Walnut Avenue
Greenfield, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0 1 2	SP-SM		POORLY GRADED SAND WITH SILT: brown, loose, moist, trace gravel (Alluvium)	0.0 - 3.5	○			
3			slightly moist					
4 5 6 7 8	SM		SILTY SAND: pale brown, loose, slightly moist	5.0 - 6.5	■	99.9	14.3	6 5 6
9 10 11 12	SP		POORLY GRADED SAND WITH SILT: pale brown, loose, slightly moist	10.0 - 11.5	■			4 3 5
13 14 15 16	CL		SANDY LEAN CLAY: brown with blue gray mottles, medium stiff, moist	15.0 - 16.5	■			3 3 6
17 18 19 20 21 22 23 24 25 26			End of Boring @ 16.5' No subsurface water encountered					

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 10

PAGE 1 OF 1
JOB NO.: 305748-001
DATE: 12/07/2022

LOGGED BY: A. Flynn
DRILL RIG: Mobile B-24 with Cathead Hammer
AUGER TYPE: 6" Hollow Stem

Greenfield Wastewater Treatment Plant Upgrade
41901 Walnut Avenue
Greenfield, California

DEPTH (feet)	USCS CLASS	SOIL DESCRIPTION	INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	SP	POORLY GRADED SAND: pale brown, loose, moist, (Alluvium)					
1			0.0 - 4.0	○			
2		slightly moist					
3							
4							
5			5.0 - 6.5	▬	85.4	6.3	5 6 7
6							
7		moist					
8		medium dense					
9							
10			10.0 - 11.5	▬	97.1	10.5	6 8 9
11							
12							
13	ML	SANDY SILT: dark grayish brown, medium stiff, moist					
14							
15			15.0 - 16.5	●			2 1 5
16		very moist moist					
17							
18		grayish brown					
19							
20	SP-SM	POORLY GRADED SAND WITH SILT: light gray brown, loose, moist	20.0 - 21.5	●			3 5 7
21							
22							
23							
24	CL	LEAN CLAY WITH SAND: gray brown, medium stiff, very moist	25.0 - 26.5	●			3 3 4
25		wet ▼					
26		End of Boring @ 26.5' Subsurface water encountered @ 25.0'					

LEGEND: ▬ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 11

LOGGED BY: A. Flynn
DRILL RIG: Track Mounted Geoprobe 7822DT with Automatic Hammer
AUGER TYPE: 6" Hollow Stem

PAGE 1 OF 1
JOB NO.: 305748-001
DATE: 12/28/2022

Greenfield Wastewater Treatment Plant Upgrade
41901 Walnut Avenue
Greenfield, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	SP-SM		POORLY GRADED SAND WITH SILT: light yellowish brown, medium dense, moist (Alluvium)					
1								
2			slightly moist					
3				3.0 - 8.0	○			
4			pale brown					
5				5.0 - 6.5	▬	92.5	8.0	6 10 15
6								
7	SP		POORLY GRADED SAND: yellowish brown, medium dense, moist					
8								
9			loose					
10				10.0 - 11.5	▬	82.6	34.4	2 3 4
11	ML		SILT WITH SAND: grayish brown, soft, very moist					
12								
13	SP		POORLY GRADED SAND: light yellowish brown, loose, moist					
14								
15				15.0 - 16.5	▬			5 6 8
16								
17			End of Boring @ 16.5' No subsurface water encountered					
18								
19								
20								
21								
22								
23								
24								
25								
26								

LEGEND: ▬ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 12

LOGGED BY: A. Flynn
DRILL RIG: Mobile B-24 with Cathead Hammer
AUGER TYPE: 6" Hollow Stem

PAGE 1 OF 1
JOB NO.: 305748-001
DATE: 12/07/2022

Greenfield Wastewater Treatment Plant Upgrade
41901 Walnut Avenue
Greenfield, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA				
				INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	SP-SM		POORLY GRADED SAND WITH SILT AND GRAVEL: brown, loose, very moist, (Alluvium)					
1			medium dense, slightly moist					
2								
3								
4								
5				5.0 - 6.5	■	103.2	6.8	6 8 11
6	SP		POORLY GRADED SAND: pale brown, medium dense, moist					
7								
8	SM		SILTY SAND: pale brown, loose, moist					
9								
10				10.0 - 11.5	■	83.7	36.0	3 5 9
11								
12								
13								
14								
15				15.0 - 16.5	■			4 7 8
16								
17								
18	CH		FAT CLAY WITH SAND: gray brown with orange mottles, medium stiff, very moist					
19								
20				20.0 - 21.5	■			3 5 6
21								
22			End of Boring @ 21.5' No subsurface water encountered					
23								
24								
25								
26								

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

APPENDIX B

Laboratory Test Results

BULK DENSITY TEST RESULTS

ASTM D 2937-17 (modified for ring liners)

January 24, 2023

BORING NO.	DEPTH feet	MOISTURE CONTENT, %	WET DENSITY, pcf	DRY DENSITY, pcf
1	6.0 - 6.5	4.6	93.5	89.4
1	11.0 - 11.5	13.2	99.2	87.6
2	6.0 - 6.5	10.4	99.7	90.3
3	6.0 - 6.5	13.9	100.3	88.1
4	6.0 - 6.5	5.4	96.5	91.6
4	11.0 - 11.5	38.1	103.5	74.9
5	6.0 - 6.5	14.0	97.3	85.4
5	11.0 - 11.5	12.2	96.6	86.2
5	16.0 - 16.5	12.5	109.6	97.5
5	21.0 - 21.5	25.6	117.1	93.2
6	6.0 - 6.5	12.0	97.1	86.7
7	6.0 - 6.5	22.7	101.2	82.5
8	6.0 - 6.5	12.1	95.9	85.5
8	16.0 - 16.5	22.2	124.7	102.1
9	6.0 - 6.5	14.3	114.2	99.9
10	6.0 - 6.5	6.3	90.8	85.4
10	11.0 - 11.5	10.5	107.3	97.1
11	6.0 - 6.5	8.0	99.8	92.5
11	11.0 - 11.5	34.4	111.0	82.6
12	6.0 - 6.5	6.8	110.1	103.2
12	21.0 - 21.5	36.0	113.9	83.7

EXPANSION INDEX TEST RESULTS

ASTM D 4829-19

BORING NO.	DEPTH feet	EXPANSION INDEX
4	0.0 - 5.0	0

Greenfield WWTP Upgrades 305748-001

RESISTANCE '*R*' VALUE AND EXPANSION PRESSURE

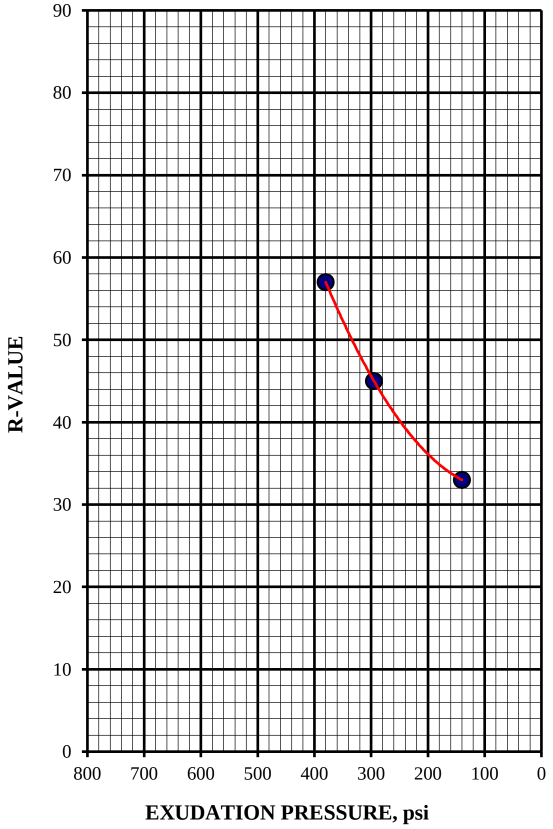
ASTM D 2844/D2844M-18

January 24, 2023

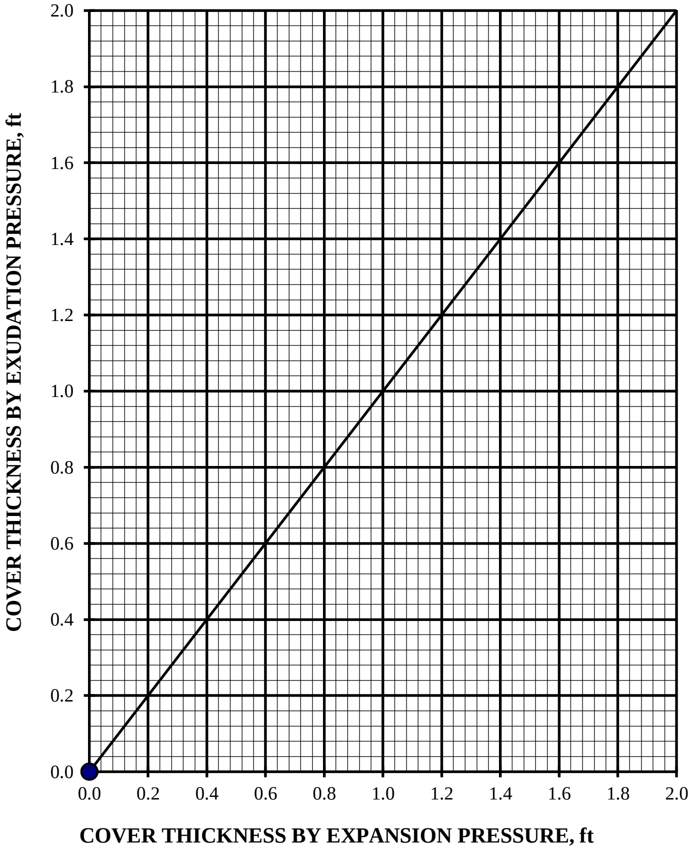
Boring #4 @ 0.0 - 5.0'
Brown Poorly Graded Sand (SP)

Dry Density @ 300 psi Exudation Pressure: 113.0-pcf
%Moisture @ 300 psi Exudation Pressure: 15.7%
R-Value - Exudation Pressure: 46
R-Value - Expansion Pressure: N/A
R-Value @ Equilibrium: 46

EXUDATION PRESSURE CHART



EXPANSION PRESSURE CHART

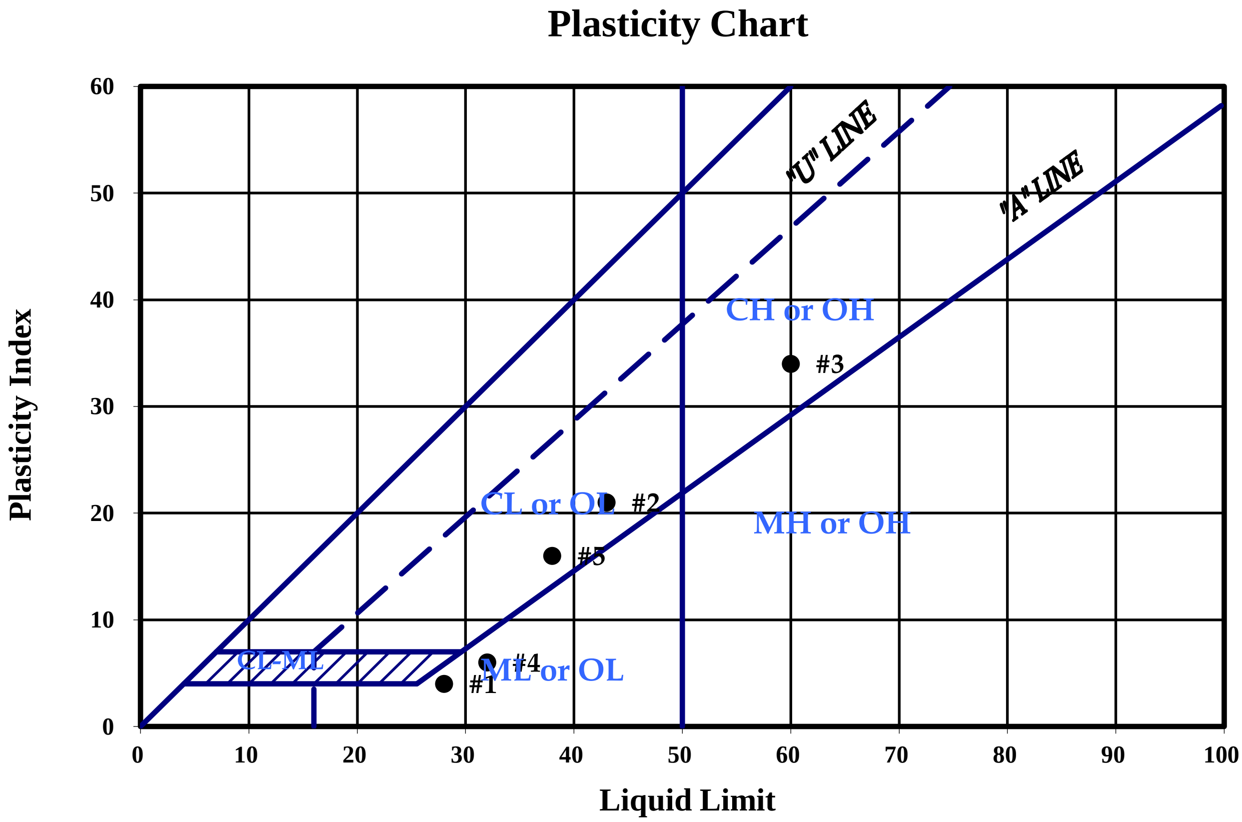


PLASTICITY INDEX

ASTM D 4318-17

January 24, 2023

Test No.:	1	2	3	4	5
Boring No.:	1	4	5	7	8
Sample Depth:	11.0 - 11.5'	11.0 - 11.5'	40.0 - 41.5'	6.0 - 6.5'	16.0 - 16.5'
Liquid Limit:	28	43	60	32	38
Plastic Limit:	24	22	26	26	22
Plasticity Index:	4	21	34	6	16

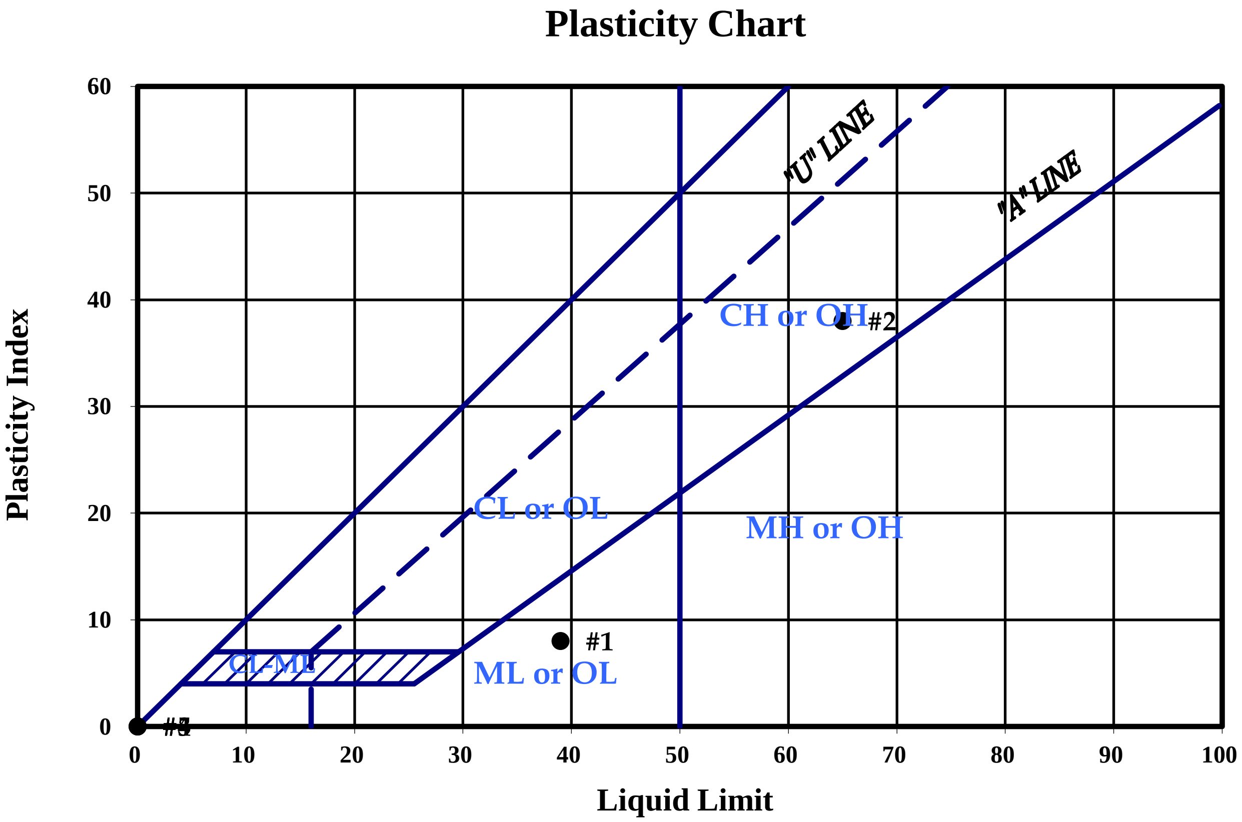


PLASTICITY INDEX

ASTM D 4318-17

January 24, 2023

Test No.:	1	2	3	4	5
Boring No.:	11	12			
Sample Depth:	11.0 - 11.5'	21.0 - 21.5'			
Liquid Limit:	39	65			
Plastic Limit:	31	27			
Plasticity Index:	8	38			



PARTICLE SIZE ANALYSIS

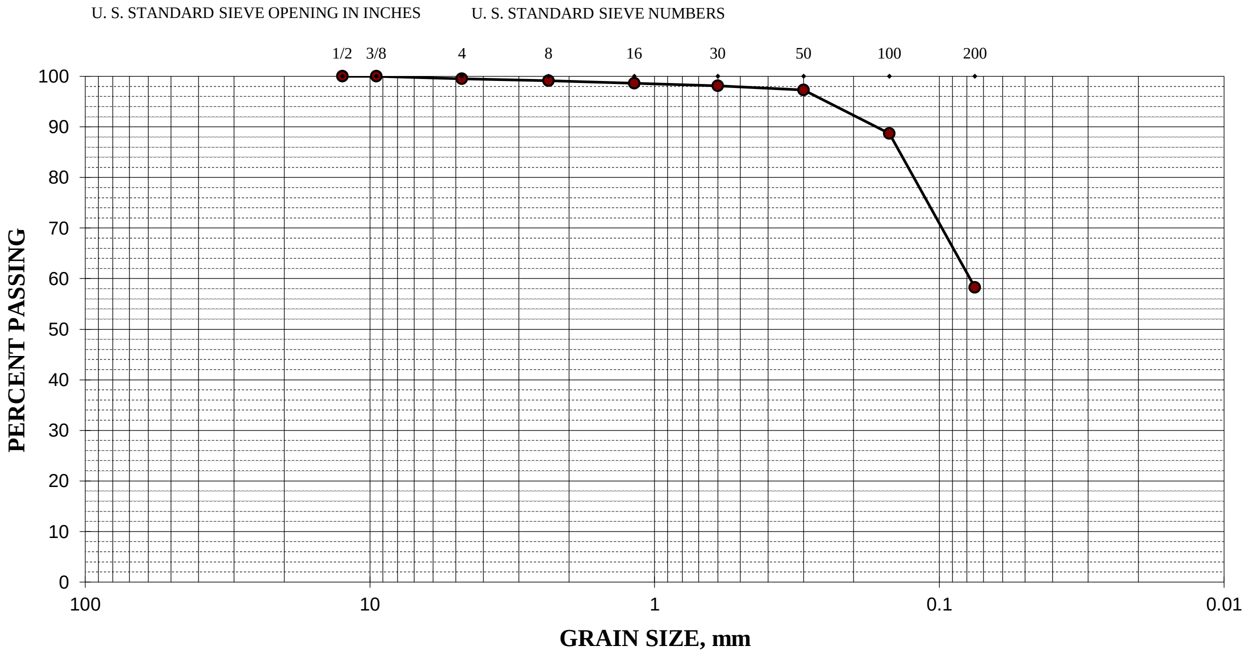
ASTM D 422-63/07; D 1140-017

Boring #1 @ 11.0 - 11.5'
Sandy Silty (ML)

January 24, 2023

LL = 28; PL = 24; PI = 4

Sieve size	% Retained	% Passing
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#8 (2.36-mm)	1	99
#16 (1.18-mm)	1	99
#30 (600-µm)	2	98
#50 (300-µm)	3	97
#100 (150-µm)	11	89
#200 (75-µm)	42	58



Greenfield WWTP Upgrades 305748-001

PARTICLE SIZE ANALYSIS

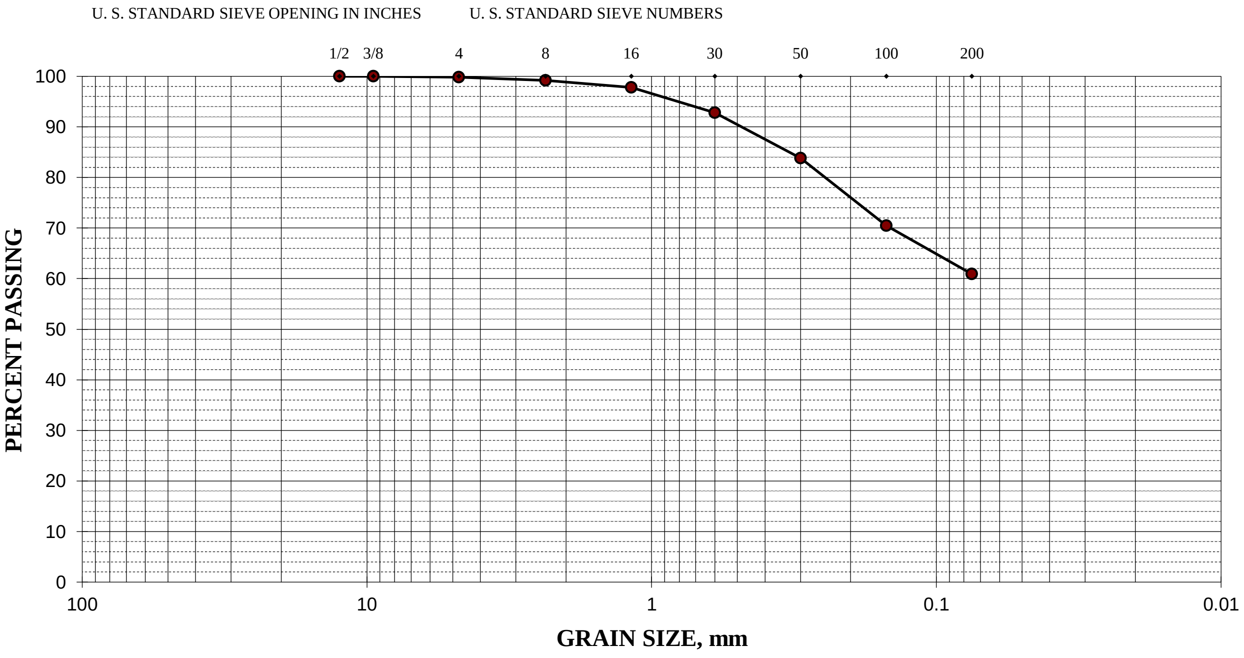
ASTM D 422-63/07; D 1140-017

Boring #4 @ 11.0 - 11.5'
Sandy Lean Clay (CL)

January 24, 2023

LL = 43; PL = 22; PI = 21

Sieve size	% Retained	% Passing
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#8 (2.36-mm)	1	99
#16 (1.18-mm)	2	98
#30 (600-µm)	7	93
#50 (300-µm)	16	84
#100 (150-µm)	30	70
#200 (75-µm)	39	61



Greenfield WWTP Upgrades 305748-001

PARTICLE SIZE ANALYSIS

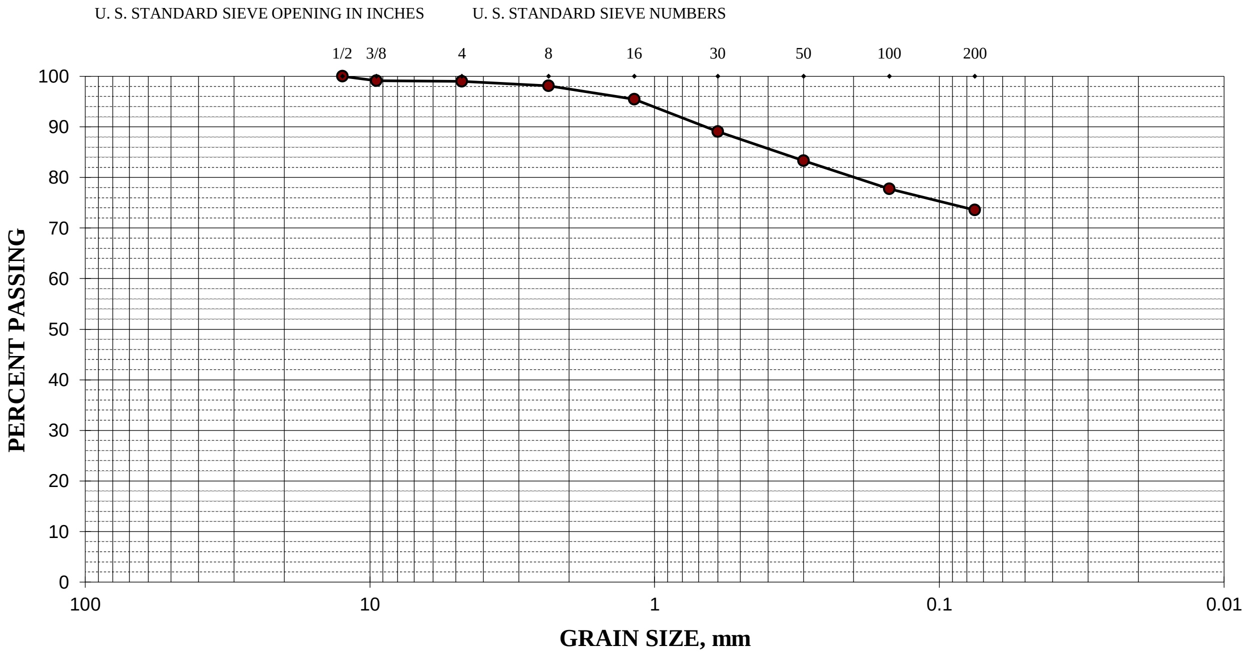
ASTM D 422-63/07; D 1140-017

Boring #5 @ 40.0 - 41.5'
Fat Clay with Sand (CH)

January 24, 2023

LL = 60; PL = 26; PI = 34

Sieve size	% Retained	% Passing
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	1	99
#4 (4.75-mm)	1	99
#8 (2.36-mm)	2	98
#16 (1.18-mm)	5	95
#30 (600-µm)	11	89
#50 (300-µm)	17	83
#100 (150-µm)	22	78
#200 (75-µm)	26	74



PARTICLE SIZE ANALYSIS

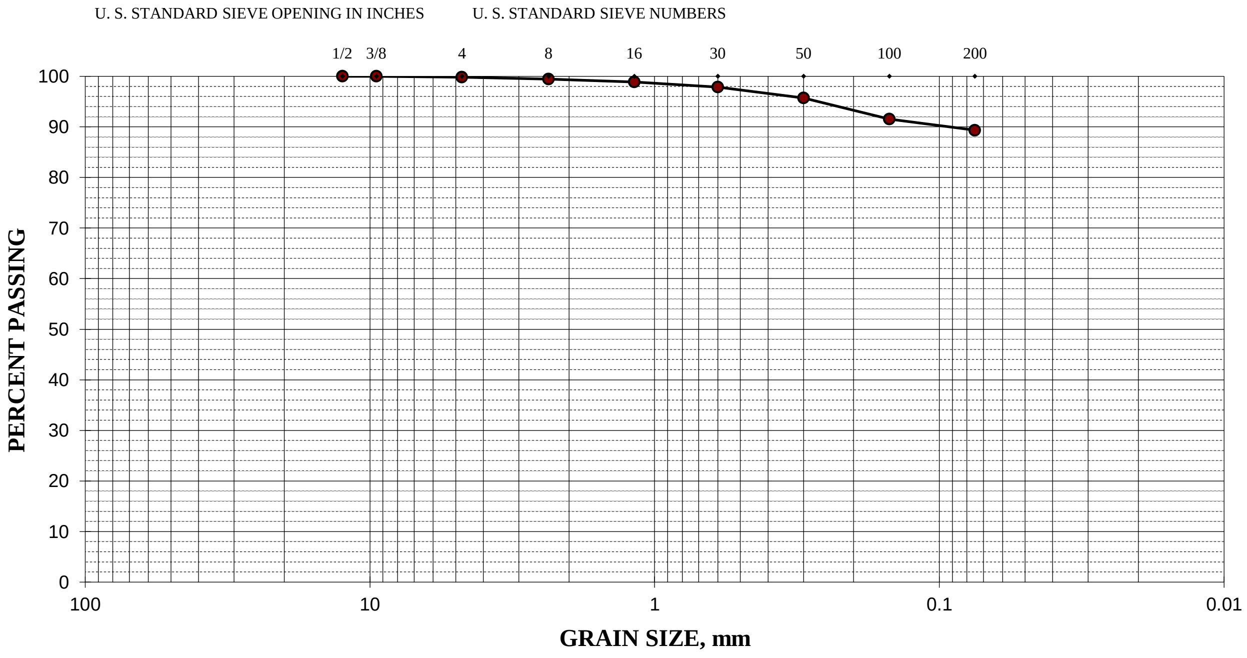
ASTM D 422-63/07; D 1140-017

Boring #7 @ 6.0 - 6.5'
Silt (ML)

January 24, 2023

LL = 32; PL = 26; PI = 6

Sieve size	% Retained	% Passing
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#8 (2.36-mm)	1	99
#16 (1.18-mm)	1	99
#30 (600-µm)	2	98
#50 (300-µm)	4	96
#100 (150-µm)	8	92
#200 (75-µm)	11	89



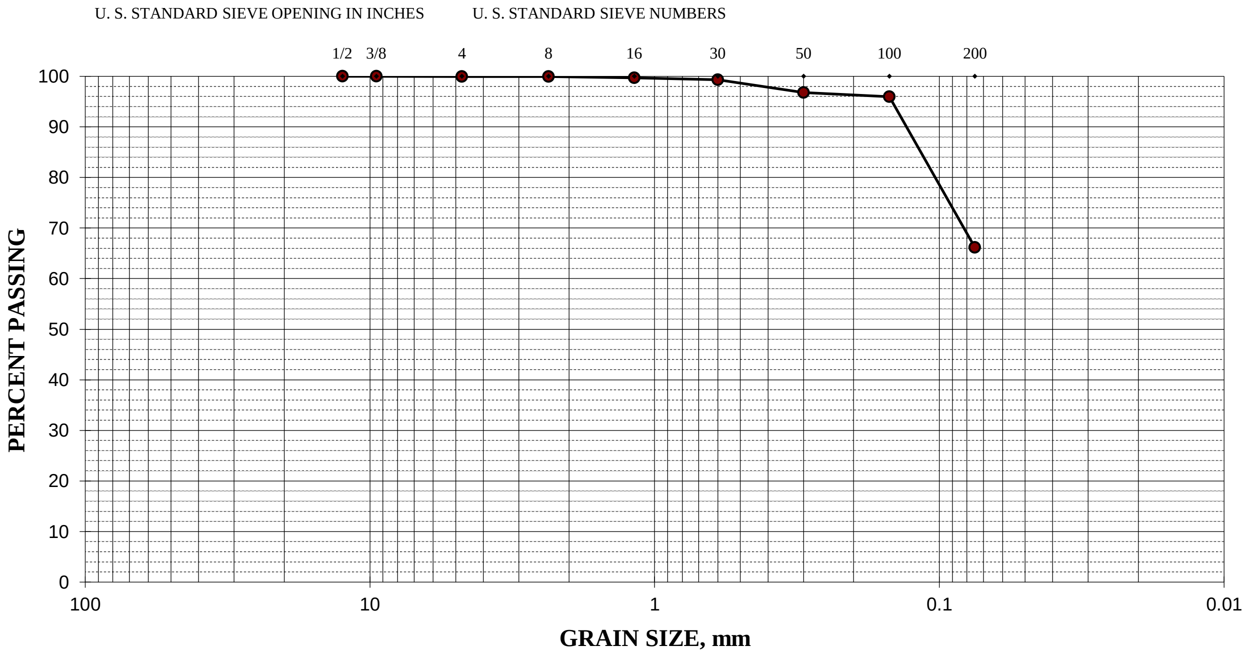
PARTICLE SIZE ANALYSIS

ASTM D 422-63/07; D 1140-017

Boring #10 @ 15.0 - 15.5'
Sandy Silt (ML)

January 24, 2023

Sieve size	% Retained	% Passing
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#8 (2.36-mm)	0	100
#16 (1.18-mm)	0	100
#30 (600-µm)	1	99
#50 (300-µm)	3	97
#100 (150-µm)	4	96
#200 (75-µm)	34	66



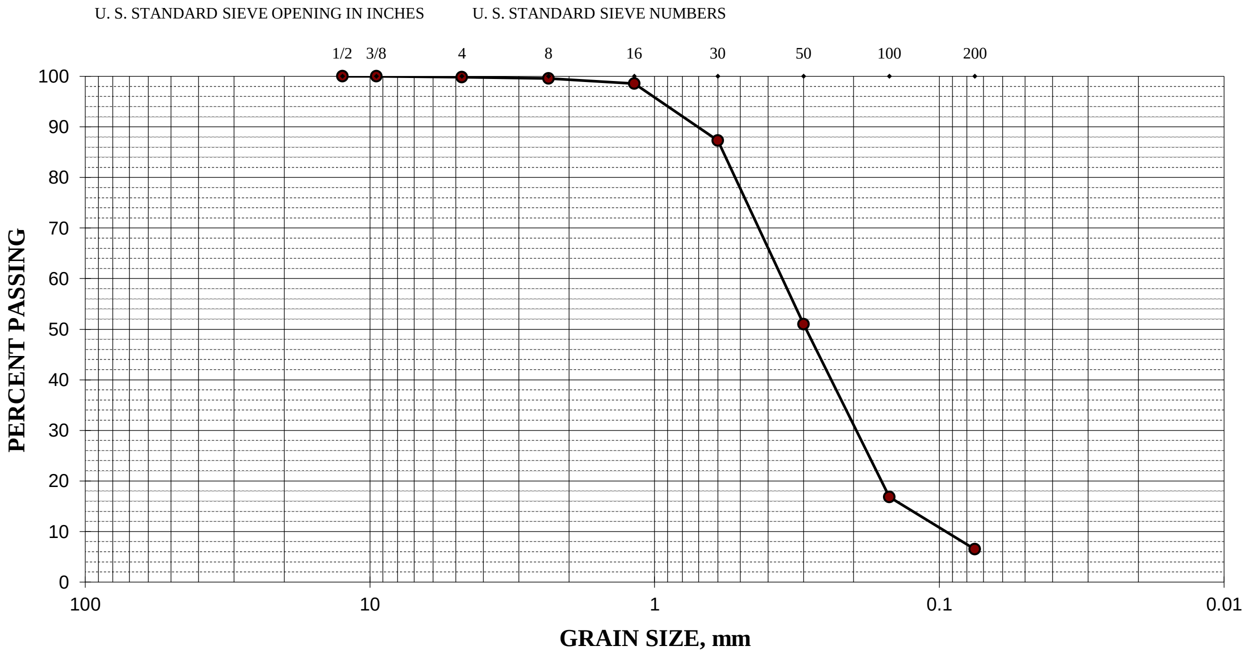
PARTICLE SIZE ANALYSIS

ASTM D 422-63/07; D 1140-017

Boring #10 @ 20.0 - 21.5'
Poorly Graded Sand with Silt (SP-SM)
Cu = 3.8; Cc = 1.1

January 24, 2023

Sieve size	% Retained	% Passing
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#8 (2.36-mm)	0	100
#16 (1.18-mm)	1	99
#30 (600-µm)	13	87
#50 (300-µm)	49	51
#100 (150-µm)	83	17
#200 (75-µm)	94	6



PARTICLE SIZE ANALYSIS

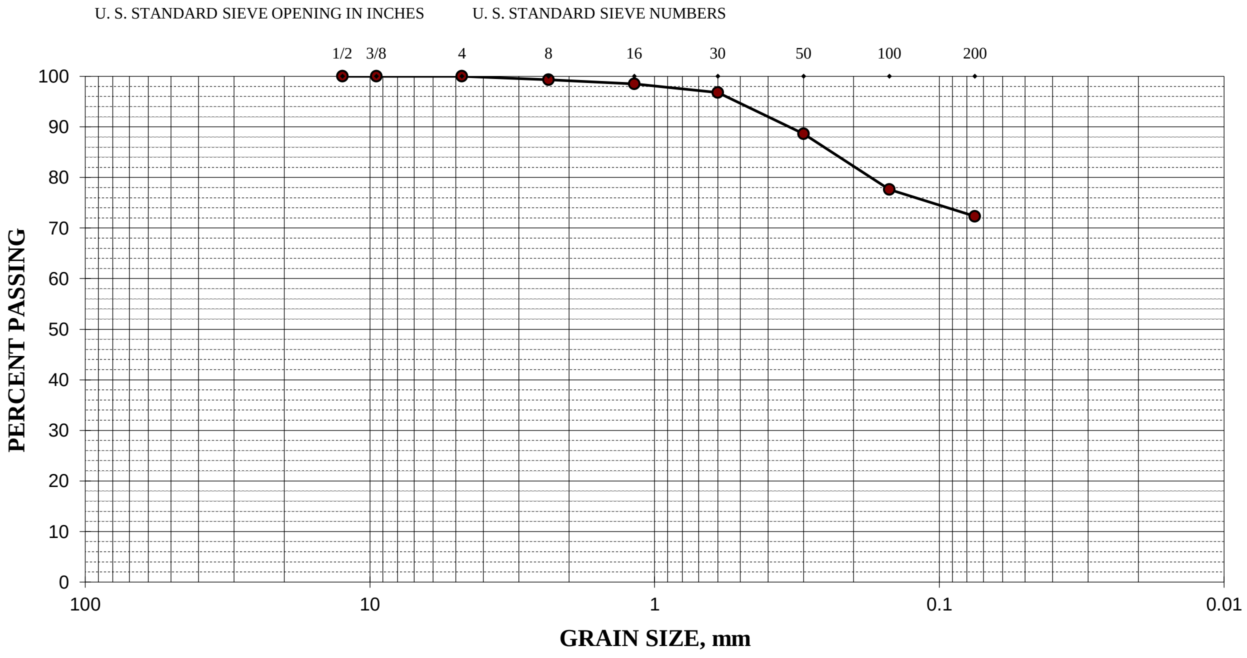
ASTM D 422-63/07; D 1140-017

Boring #10 @ 25.0 - 26.5'

January 24, 2023

Brown Lean Clay with Sand (CL)

Sieve size	% Retained	% Passing
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#8 (2.36-mm)	1	99
#16 (1.18-mm)	2	98
#30 (600-µm)	3	97
#50 (300-µm)	11	89
#100 (150-µm)	22	78
#200 (75-µm)	28	72



PARTICLE SIZE ANALYSIS

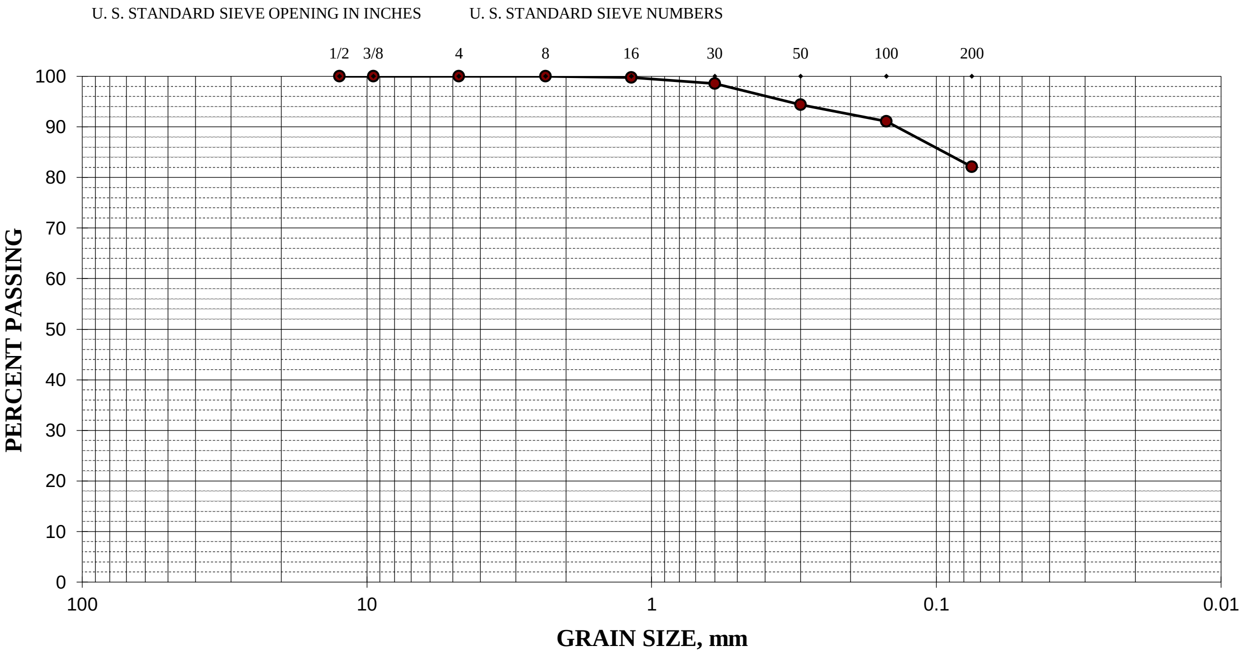
ASTM D 422-63/07; D 1140-017

Boring #11 @ 11.0 - 11.5'
Silt with Sand (ML)

January 24, 2023

LL = 39; PL = 31; PI = 8

Sieve size	% Retained	% Passing
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	0	100
#8 (2.36-mm)	0	100
#16 (1.18-mm)	0	100
#30 (600-µm)	1	99
#50 (300-µm)	6	94
#100 (150-µm)	9	91
#200 (75-µm)	18	82



PARTICLE SIZE ANALYSIS

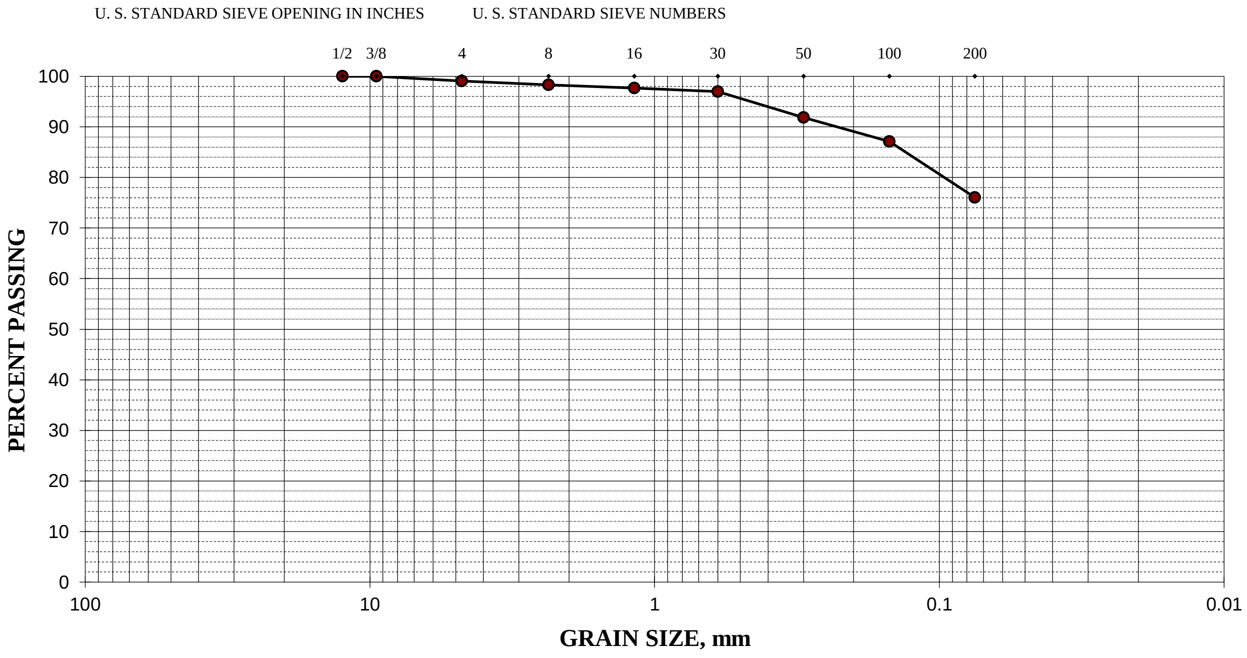
ASTM D 422-63/07; D 1140-017

Boring #12 @ 21.0 - 21.5'
Fat Clay with Sand (CH)

January 24, 2023

LL = 65; PL = 27; PI = 38

Sieve size	% Retained	% Passing
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	0	100
#4 (4.75-mm)	1	99
#8 (2.36-mm)	2	98
#16 (1.18-mm)	2	98
#30 (600-µm)	3	97
#50 (300-µm)	8	92
#100 (150-µm)	13	87
#200 (75-µm)	24	76



Greenfield WWTP Upgrades 305748-001

MOISTURE-DENSITY COMPACTION TEST

ASTM D 1557-12 (Modified)

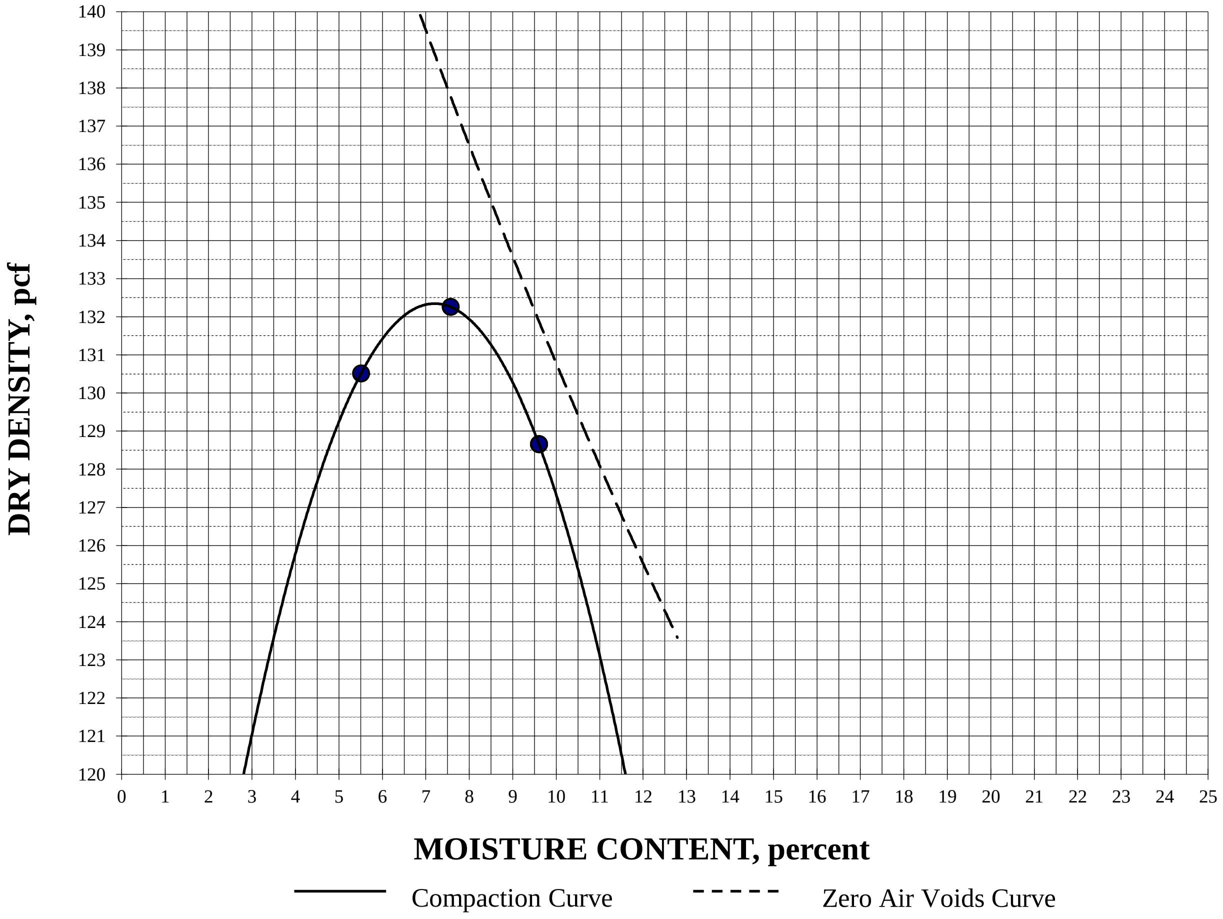
PROCEDURE USED: C
PREPARATION METHOD: Moist
RAMMER TYPE: Mechanical
SPECIFIC GRAVITY: 2.65 (assumed)

January 24, 2023
Boring #2 @ 0.0 - 4.0'
Brown Poorly Graded Sand with Silt (SP-SM)

SIEVE DATA:

Sieve Size	% Retained (Cumulative)
3/4"	1
3/8"	5
#4	13

MAXIMUM DRY DENSITY: 132.3 pcf
OPTIMUM MOISTURE: 7.2%



DIRECT SHEAR

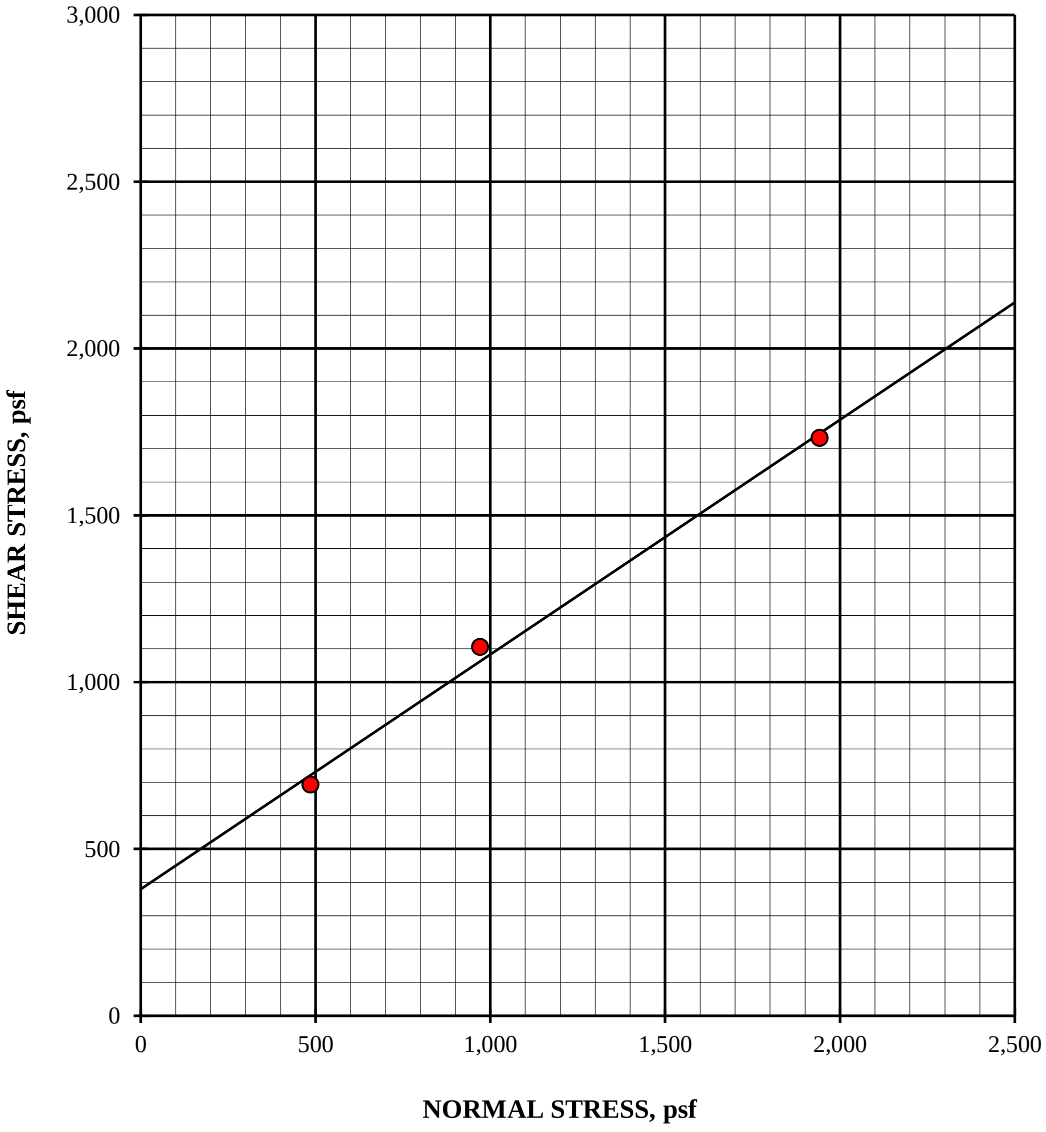
ASTM D 3080/D3080M-11 (modified for consolidated, undrained conditions)

January 24, 2023

Boring #2 @ 0.0 - 4.0'
Poorly Graded Sand with Silt (SP-SM)
Compacted to 90% RC, saturated

INITIAL DRY DENSITY: 119.1 pcf
INITIAL MOISTURE CONTENT: 7.2 %
PEAK SHEAR ANGLE (Ø): 35°
COHESION (C): 380 psf

SHEAR vs. NORMAL STRESS

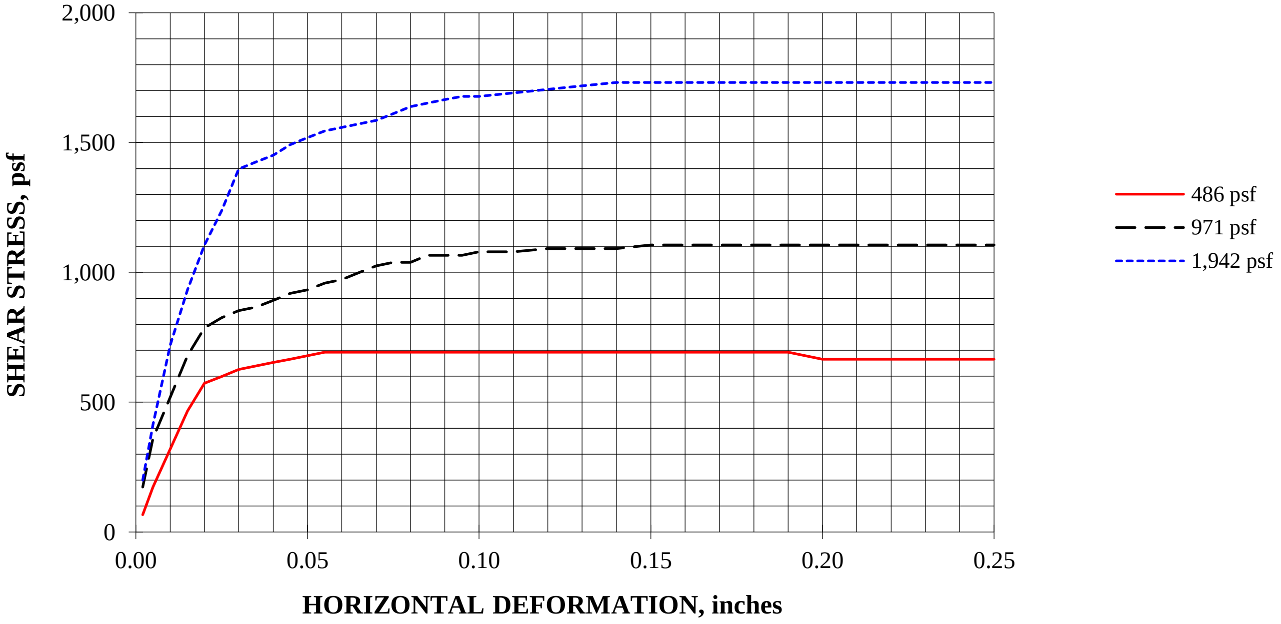


DIRECT SHEAR continued

ASTM D 3080/D3080M-11 (modified for consolidated, undrained conditions)

Boring #2 @ 0.0 - 4.0' January 24, 2023
Poorly Graded Sand with Silt (SP-SM)
Compacted to 90% RC, saturated SPECIFIC GRAVITY: 2.65 (assumed)

SAMPLE NO.:	1	2	3	AVERAGE
INITIAL				
WATER CONTENT, %	7.2	7.2	7.2	7.2
DRY DENSITY, pcf	119.1	119.1	119.1	119.1
SATURATION, %	49.1	49.1	49.1	49.1
VOID RATIO	0.388	0.388	0.388	0.388
DIAMETER, inches	2.410	2.410	2.410	
HEIGHT, inches	1.00	1.00	1.00	
AT TEST				
WATER CONTENT, %	15.4	15.4	14.5	
DRY DENSITY, pcf	120.7	123.7	125.2	
SATURATION, %	100.0	100.0	100.0	
VOID RATIO	0.370	0.337	0.320	
HEIGHT, inches	0.99	0.96	0.95	



MOISTURE-DENSITY COMPACTION TEST

ASTM D 1557-12 (Modified)

PROCEDURE USED: A

January 24, 2023

PREPARATION METHOD: Moist

Boring #5 @ 0.0 - 5.0'

RAMMER TYPE: Mechanical

Brown Silty Sand (SM)

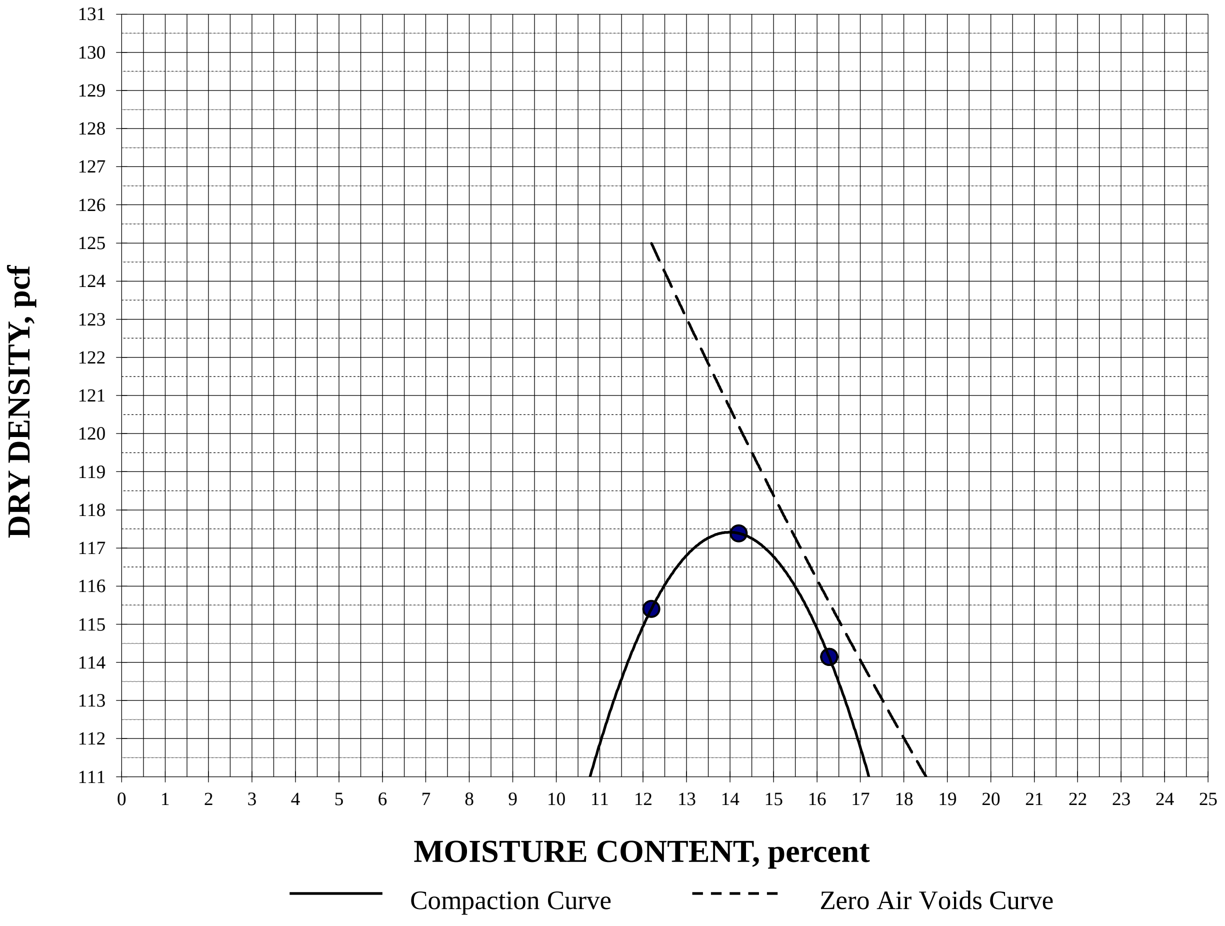
SPECIFIC GRAVITY: 2.65 (assumed)

SIEVE DATA:

Sieve Size	% Retained (Cumulative)
3/4"	0
3/8"	0
#4	0

MAXIMUM DRY DENSITY: 117.4 pcf

OPTIMUM MOISTURE: 14.0%



Greenfield WWTP Upgrades 305748-001

DIRECT SHEAR

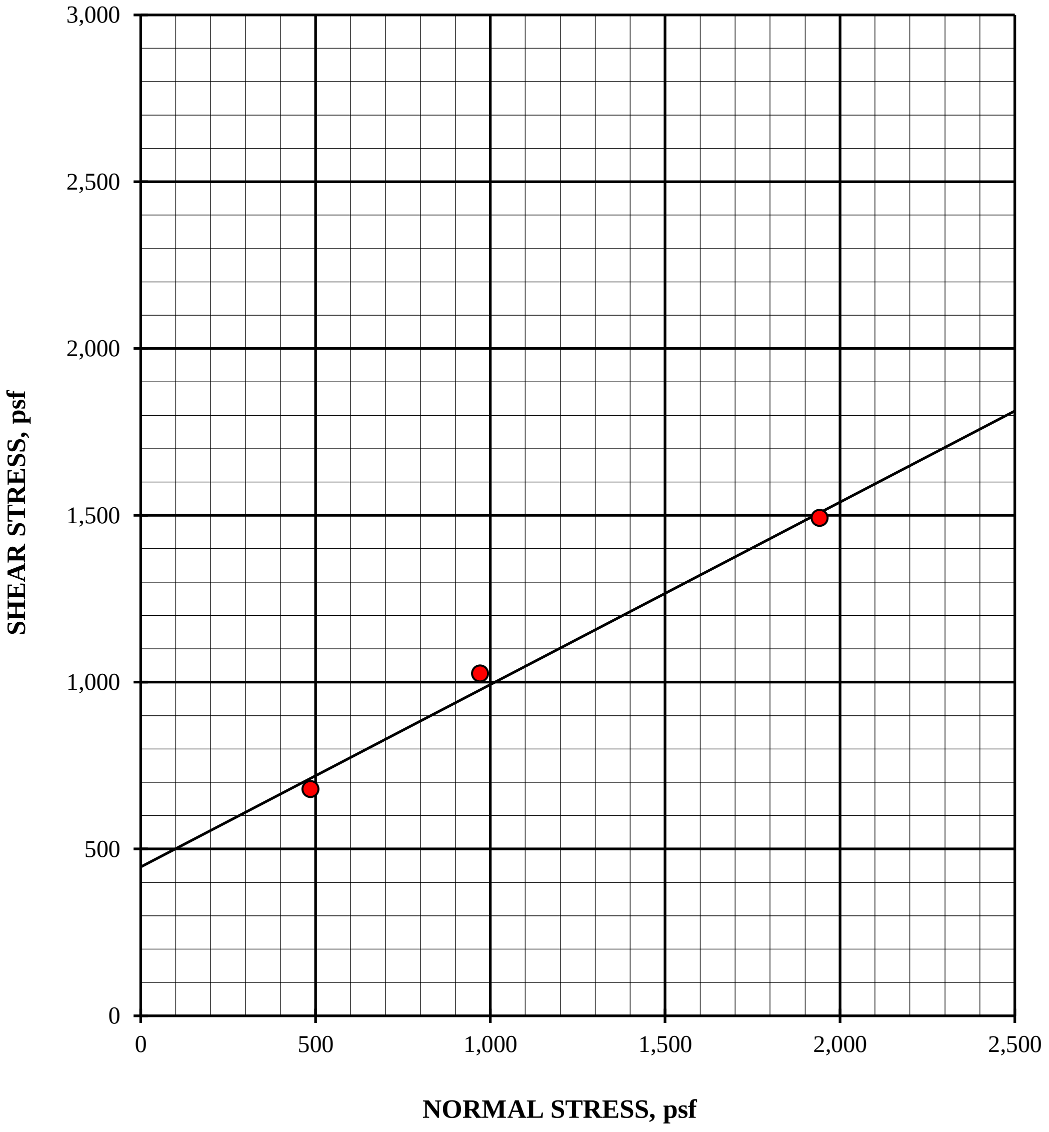
ASTM D 3080/D3080M-11 (modified for consolidated, undrained conditions)

January 24, 2023

Boring #5 @ 0.0 - 5.0'
Silty Sand (SM)
Compacted to 90% RC, saturated

INITIAL DRY DENSITY: 105.7 pcf
INITIAL MOISTURE CONTENT: 14.0 %
PEAK SHEAR ANGLE (Ø): 29°
COHESION (C): 446 psf

SHEAR vs. NORMAL STRESS



DIRECT SHEAR continued

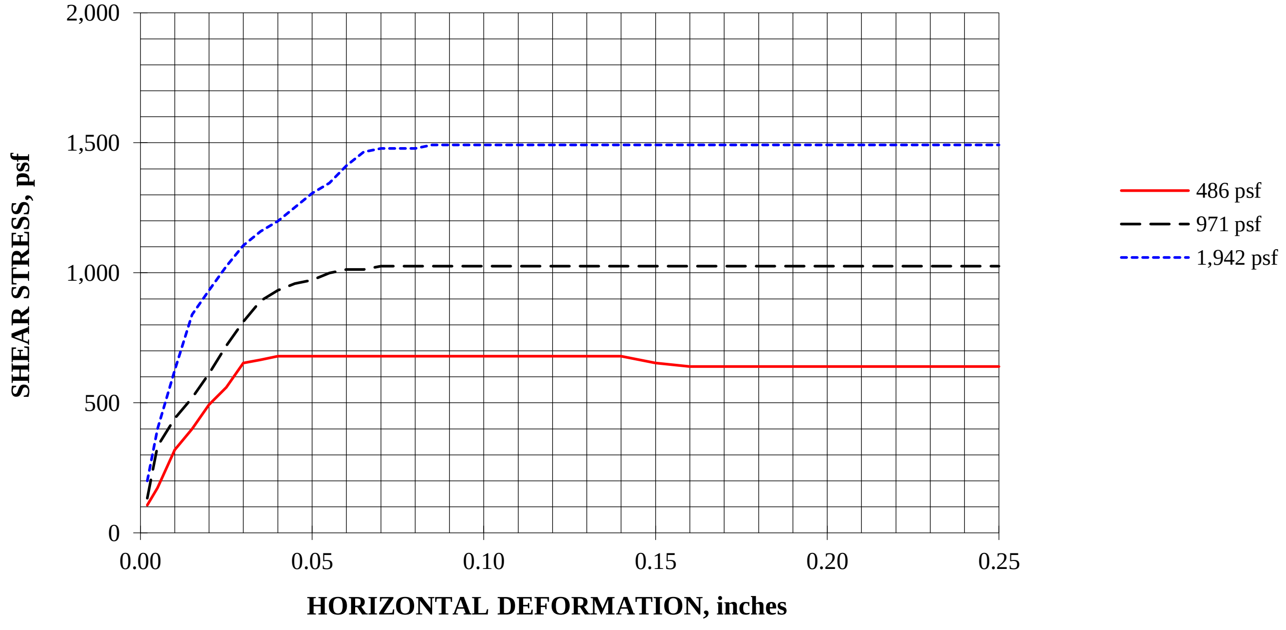
ASTM D 3080/D3080M-11 (modified for consolidated, undrained conditions)

Boring #5 @ 0.0 - 5.0' January 24, 2023

Silty Sand (SM)

Compacted to 90% RC, saturated SPECIFIC GRAVITY: 2.65 (assumed)

SAMPLE NO.:	**1**	**2**	**3**	**AVERAGE**
INITIAL				
WATER CONTENT, %	14.0	14.0	14.0	14.0
DRY DENSITY, pcf	105.7	105.7	105.7	105.7
SATURATION, %	65.7	65.7	65.7	65.7
VOID RATIO	0.565	0.565	0.565	0.565
DIAMETER, inches	2.410	2.410	2.410	
HEIGHT, inches	1.00	1.00	1.00	
AT TEST				
WATER CONTENT, %	24.2	25.3	22.9	
DRY DENSITY, pcf	106.6	108.3	111.7	
SATURATION, %	100.0	100.0	100.0	
VOID RATIO	0.551	0.527	0.480	
HEIGHT, inches	0.99	0.98	0.95	



DIRECT SHEAR

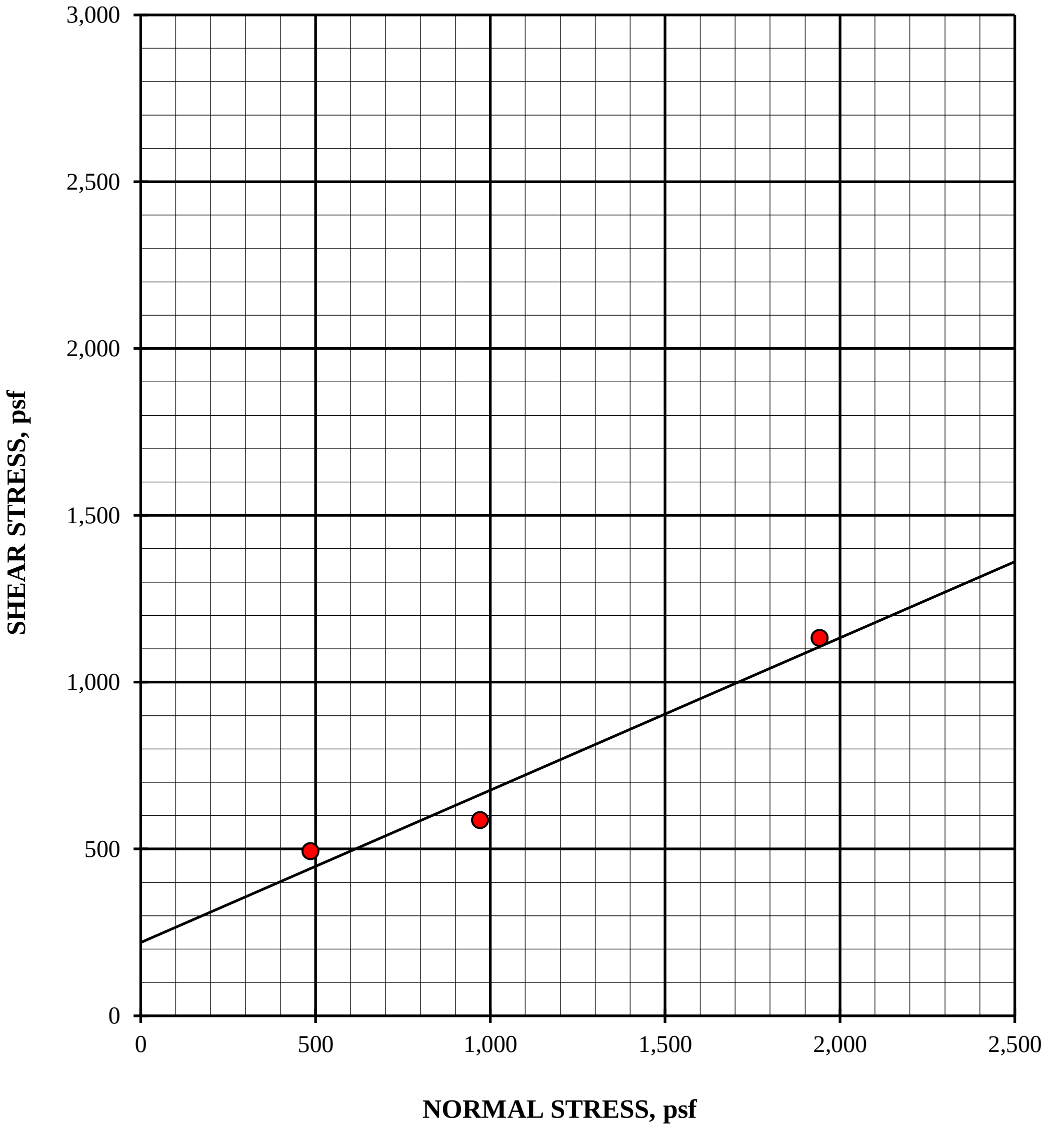
ASTM D 3080/D3080M-11 (modified for consolidated, undrained conditions)

January 24, 2023

Boring #5 @ 6.0 - 6.5'
Silty Sand (SM)
Ring sample, saturated

INITIAL DRY DENSITY: 87.1 pcf
INITIAL MOISTURE CONTENT: 14.0 %
PEAK SHEAR ANGLE (Ø): 25°
COHESION (C): 220 psf

SHEAR vs. NORMAL STRESS



DIRECT SHEAR continued

ASTM D 3080/D3080M-11 (modified for consolidated, undrained conditions)

Boring #5 @ 6.0 - 6.5'

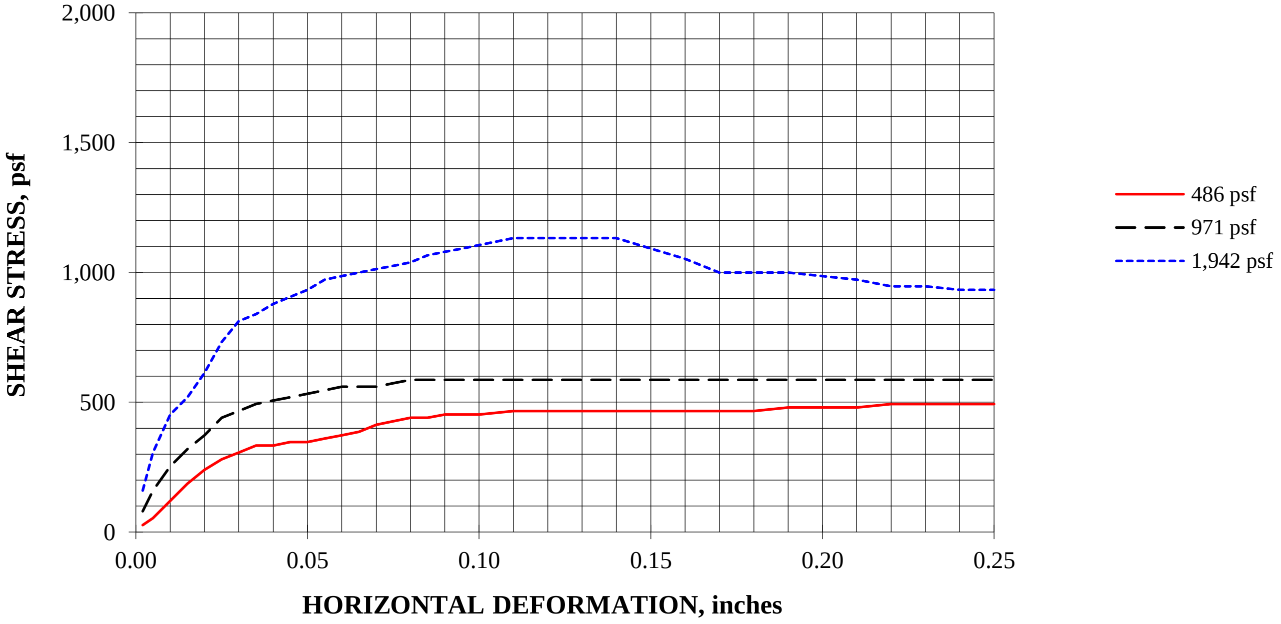
January 24, 2023

Silty Sand (SM)

Ring sample, saturated

SPECIFIC GRAVITY: 2.65 (assumed)

SAMPLE NO.:	1	2	3	AVERAGE
INITIAL				
WATER CONTENT, %	14.0	14.0	14.0	14.0
DRY DENSITY, pcf	90.8	83.7	87.0	87.1
SATURATION, %	45.1	38.0	41.2	41.4
VOID RATIO	0.822	0.977	0.900	0.900
DIAMETER, inches	2.410	2.410	2.410	
HEIGHT, inches	1.00	1.00	1.00	
AT TEST				
WATER CONTENT, %	30.4	43.1	37.5	
DRY DENSITY, pcf	92.1	86.0	90.0	
SATURATION, %	100.0	100.0	100.0	
VOID RATIO	0.796	0.923	0.837	
HEIGHT, inches	0.99	0.97	0.97	



DIRECT SHEAR

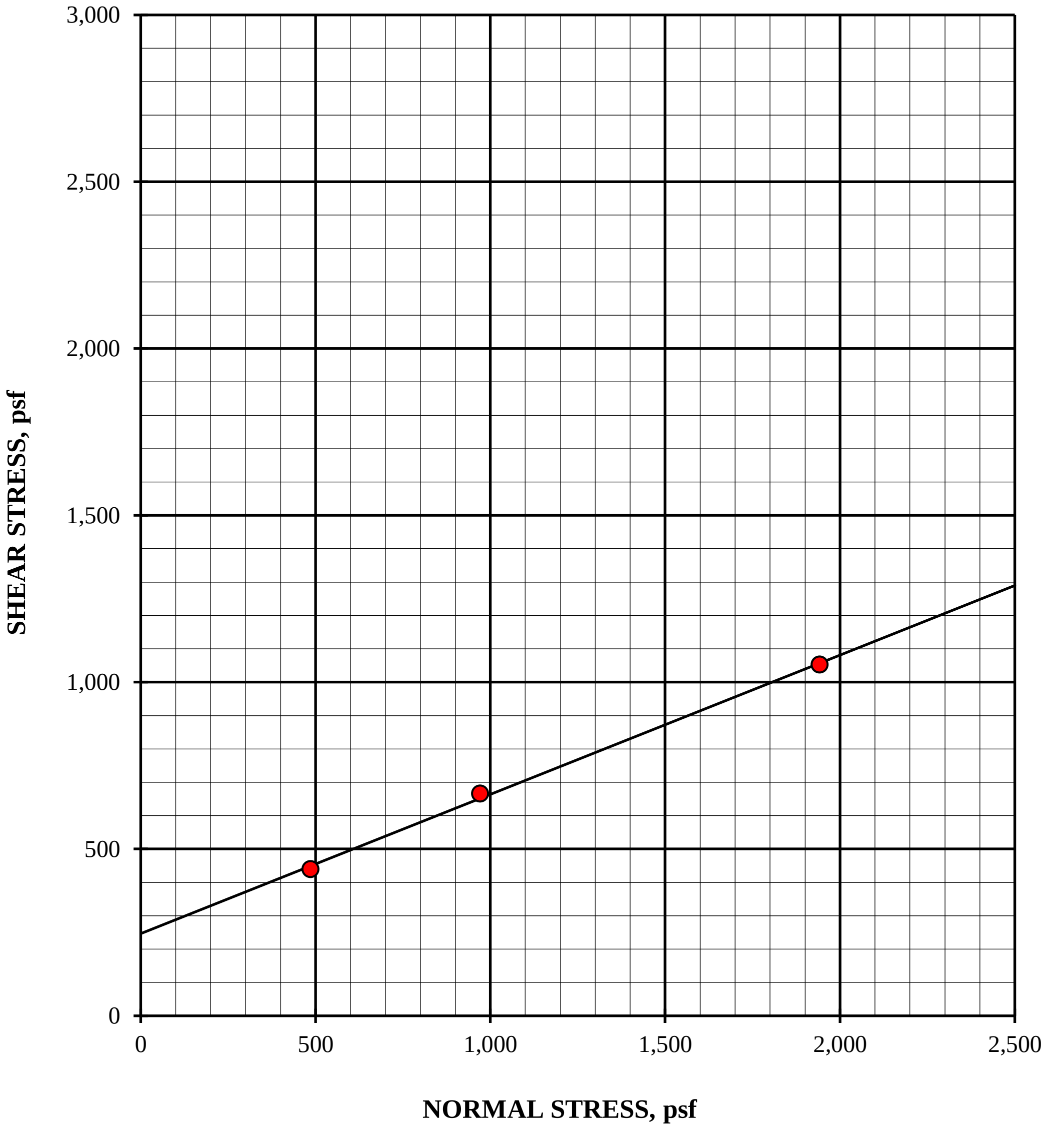
ASTM D 3080/D3080M-11 (modified for consolidated, undrained conditions)

January 24, 2023

Boring #5 @ 11.0 - 11.5'
Silty Sand (SM)
Ring sample, saturated

INITIAL DRY DENSITY: 86.1 pcf
INITIAL MOISTURE CONTENT: 12.2 %
PEAK SHEAR ANGLE (Ø): 23°
COHESION (C): 246 psf

SHEAR vs. NORMAL STRESS

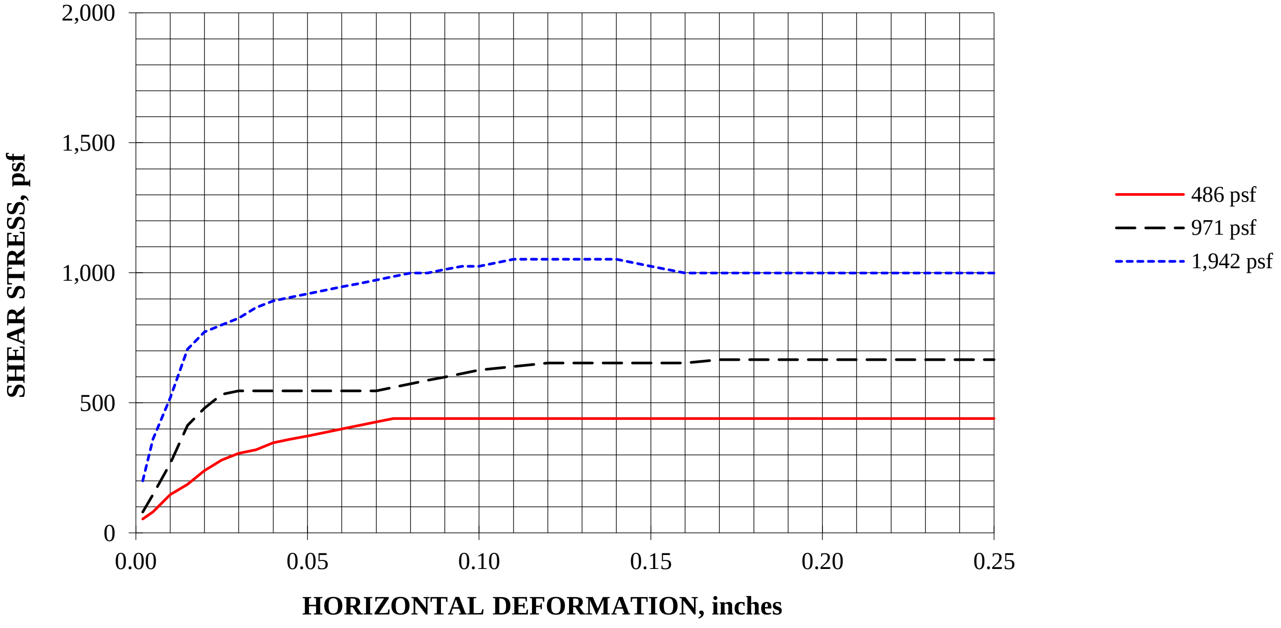


DIRECT SHEAR continued

ASTM D 3080/D3080M-11 (modified for consolidated, undrained conditions)

Boring #5 @ 11.0 - 11.5'
January 24, 2023
Silty Sand (SM)
Ring sample, saturated
SPECIFIC GRAVITY: 2.65 (assumed)

SAMPLE NO.:	**1**	**2**	**3**	**AVERAGE**
INITIAL				
WATER CONTENT, %	12.2	12.2	12.2	12.2
DRY DENSITY, pcf	87.4	86.1	84.9	86.1
SATURATION, %	36.2	35.1	34.1	35.2
VOID RATIO	0.892	0.920	0.947	0.920
DIAMETER, inches	2.410	2.410	2.410	
HEIGHT, inches	1.00	1.00	1.00	
AT TEST				
WATER CONTENT, %	34.4	32.9	30.3	
DRY DENSITY, pcf	87.6	86.4	88.9	
SATURATION, %	100.0	95.2	93.4	
VOID RATIO	0.887	0.914	0.859	
HEIGHT, inches	1.00	1.00	0.96	



DIRECT SHEAR

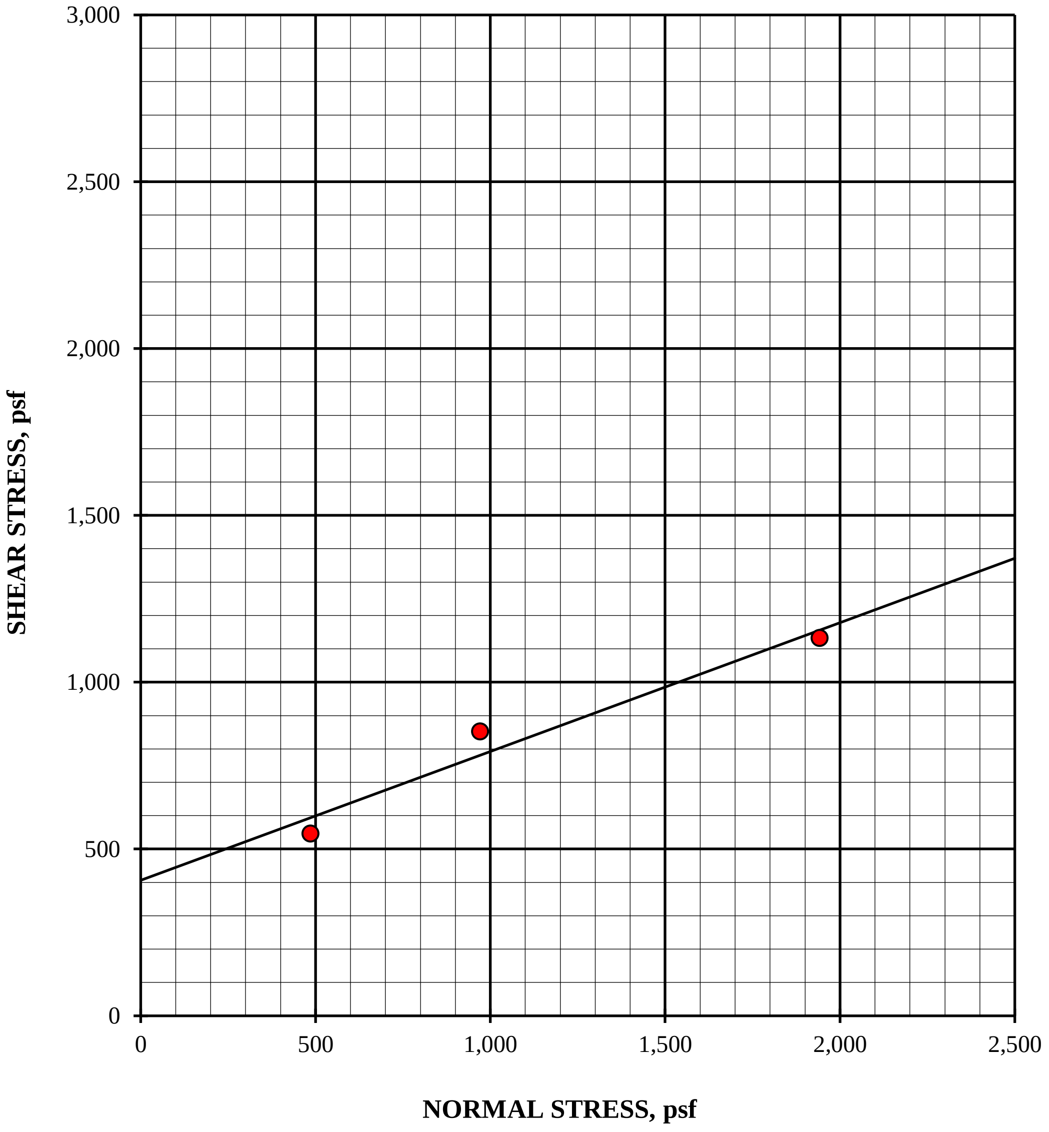
ASTM D 3080/D3080M-11 (modified for consolidated, undrained conditions)

January 24, 2023

Boring #5 @ 16.0 - 16.5'
Silty Sand (SM)
Ring sample, saturated

INITIAL DRY DENSITY: 96.9 pcf
INITIAL MOISTURE CONTENT: 12.5 %
PEAK SHEAR ANGLE (Ø): 21°
COHESION (C): 406 psf

SHEAR vs. NORMAL STRESS



DIRECT SHEAR continued

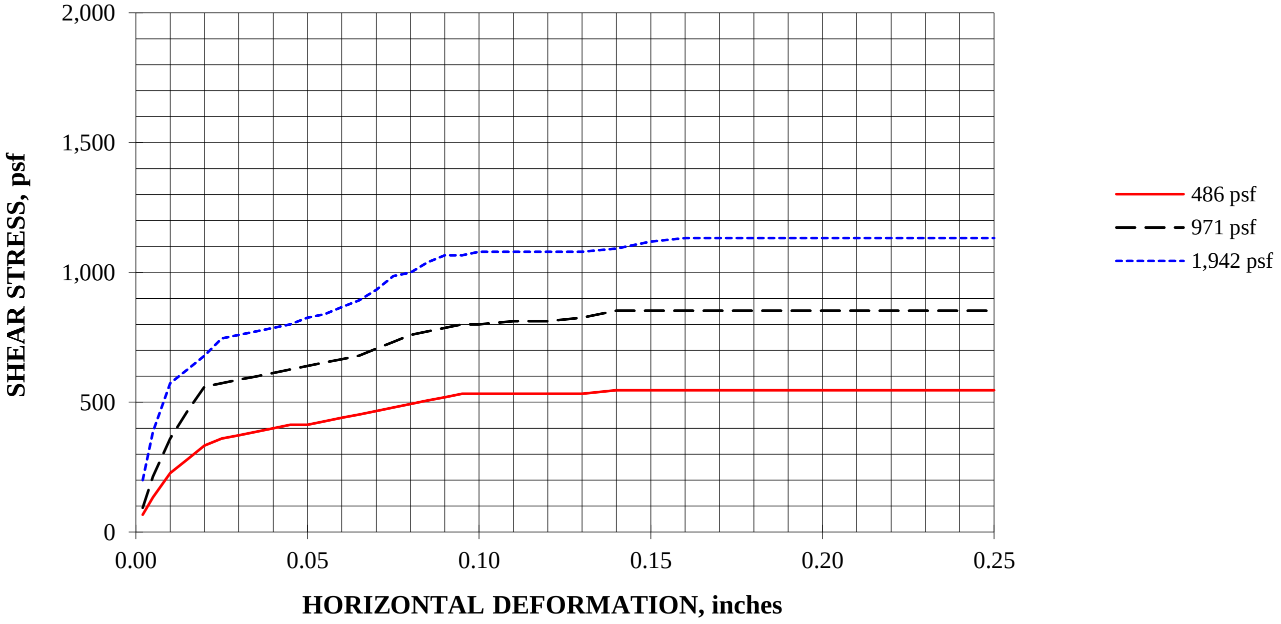
ASTM D 3080/D3080M-11 (modified for consolidated, undrained conditions)

Boring #5 @ 16.0 - 16.5'
January 24, 2023

Silty Sand (SM)

Ring sample, saturated
SPECIFIC GRAVITY: 2.65 (assumed)

SAMPLE NO.:	**1**	**2**	**3**	**AVERAGE**
INITIAL				
WATER CONTENT, %	12.5	12.5	12.5	12.5
DRY DENSITY, pcf	97.2	97.0	96.5	96.9
SATURATION, %	47.2	47.0	46.4	46.9
VOID RATIO	0.702	0.704	0.714	0.707
DIAMETER, inches	2.410	2.410	2.410	
HEIGHT, inches	1.00	1.00	1.00	
AT TEST				
WATER CONTENT, %	32.9	32.4	32.1	
DRY DENSITY, pcf	98.4	99.7	101.3	
SATURATION, %	100.0	100.0	100.0	
VOID RATIO	0.681	0.658	0.633	
HEIGHT, inches	0.99	0.97	0.95	



DIRECT SHEAR

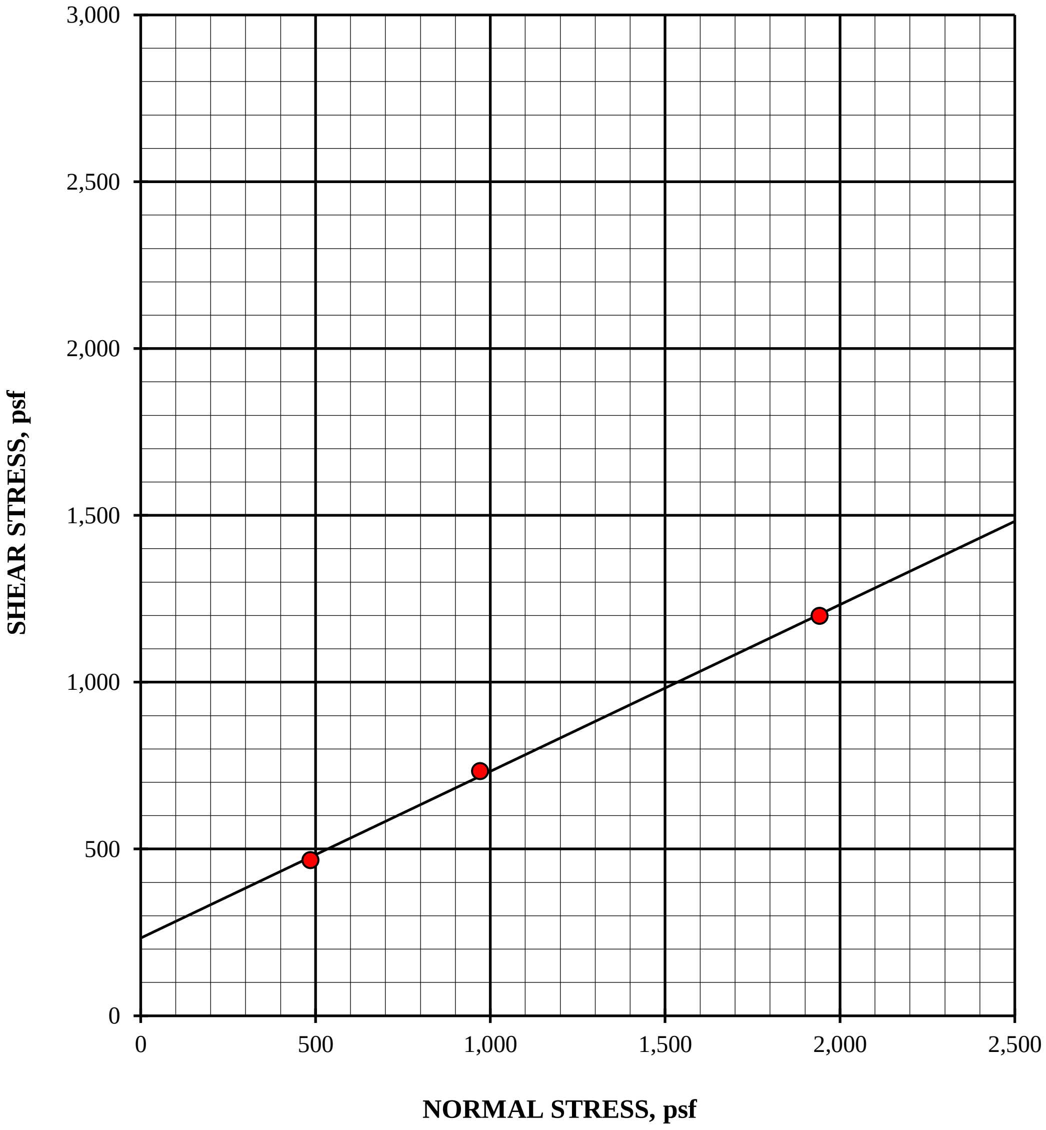
ASTM D 3080/D3080M-11 (modified for consolidated, undrained conditions)

January 24, 2023

Boring #5 @ 21.0 -21.5'
Silty Sand (SM)
Ring sample, saturated

INITIAL DRY DENSITY: 94.2 pcf
INITIAL MOISTURE CONTENT: 25.6 %
PEAK SHEAR ANGLE (Ø): 27°
COHESION (C): 233 psf

SHEAR vs. NORMAL STRESS



DIRECT SHEAR continued

ASTM D 3080/D3080M-11 (modified for consolidated, undrained conditions)

Boring #5 @ 21.0 -21.5'

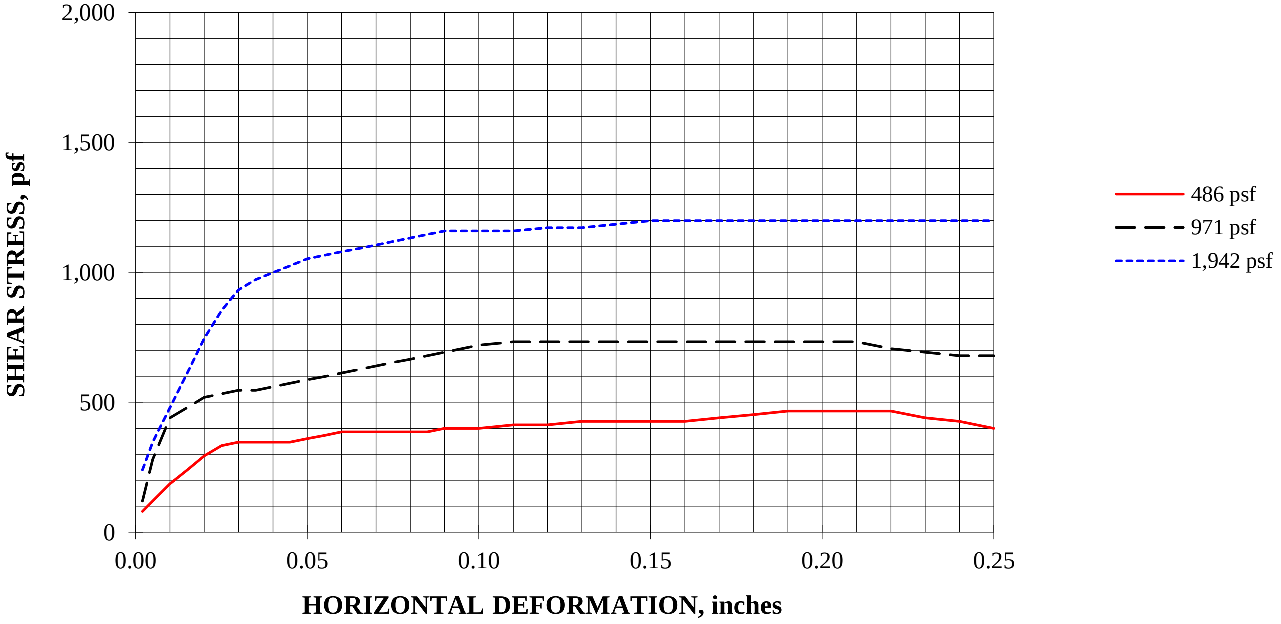
January 24, 2023

Silty Sand (SM)

Ring sample, saturated

SPECIFIC GRAVITY: 2.65 (assumed)

SAMPLE NO.:	1	2	3	AVERAGE
INITIAL				
WATER CONTENT, %	25.6	25.6	25.6	25.6
DRY DENSITY, pcf	94.5	94.6	93.6	94.2
SATURATION, %	90.4	90.7	88.5	89.9
VOID RATIO	0.750	0.748	0.766	0.755
DIAMETER, inches	2.410	2.410	2.410	
HEIGHT, inches	1.00	1.00	1.00	
AT TEST				
WATER CONTENT, %	39.0	37.4	37.2	
DRY DENSITY, pcf	95.8	97.8	98.8	
SATURATION, %	100.0	100.0	100.0	
VOID RATIO	0.726	0.690	0.674	
HEIGHT, inches	0.99	0.97	0.95	



MOISTURE-DENSITY COMPACTION TEST

ASTM D 1557-12 (Modified)

PROCEDURE USED: A

PREPARATION METHOD: Moist

RAMMER TYPE: Mechanical

SPECIFIC GRAVITY: 2.65 (assumed)

January 24, 2023

Boring #8 @ 1.0 - 5.0'

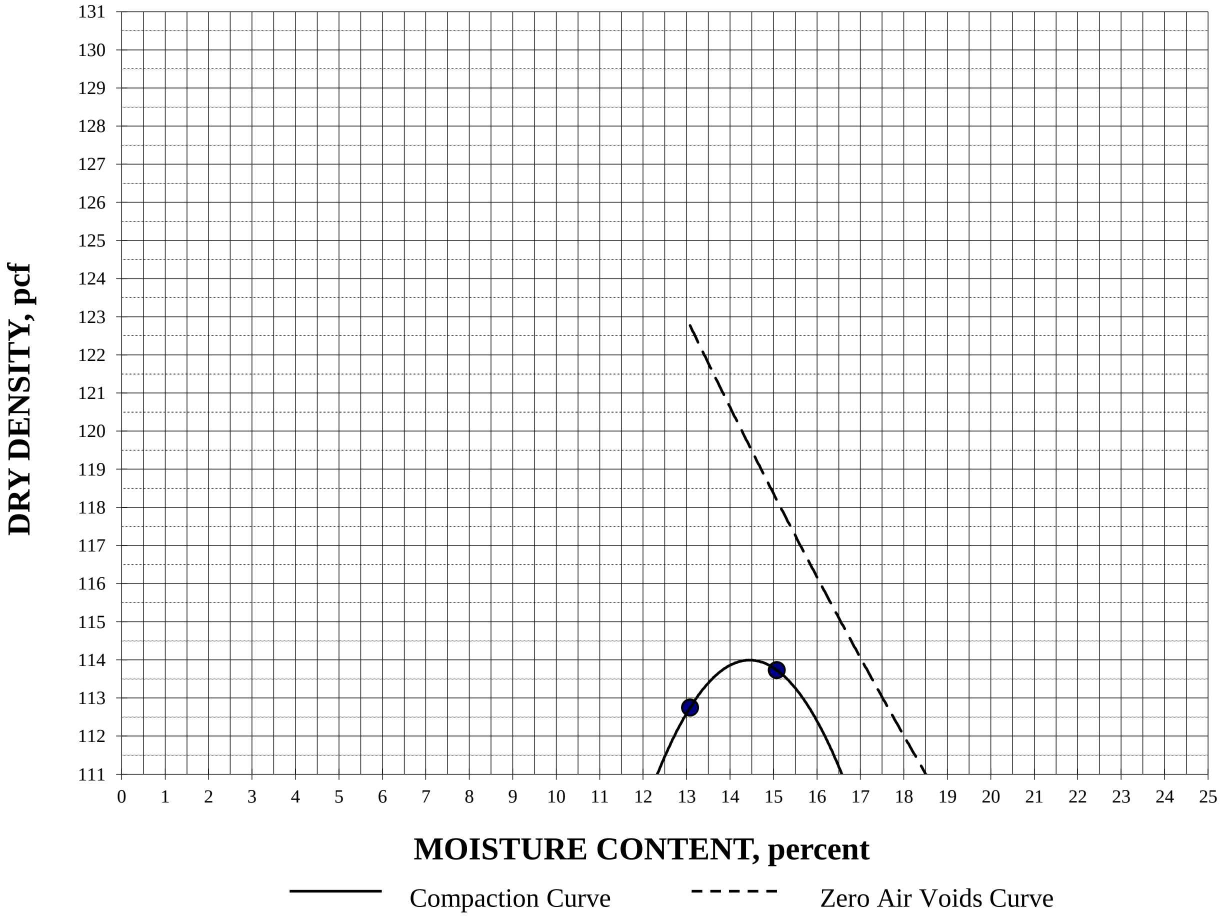
Dark Brown Silty Sand (SM)

SIEVE DATA:

Sieve Size	% Retained (Cumulative)
3/4"	0
3/8"	0
#4	0

MAXIMUM DRY DENSITY: 114.0 pcf

OPTIMUM MOISTURE: 14.5%



MOISTURE-DENSITY COMPACTION TEST

ASTM D 1557-12 (Modified)

PROCEDURE USED: A

January 24, 2023

PREPARATION METHOD: Moist

Boring #10 @ 1.0 - 4.0'

RAMMER TYPE: Mechanical

Pale Brown Poorly Graded Sand (SP)

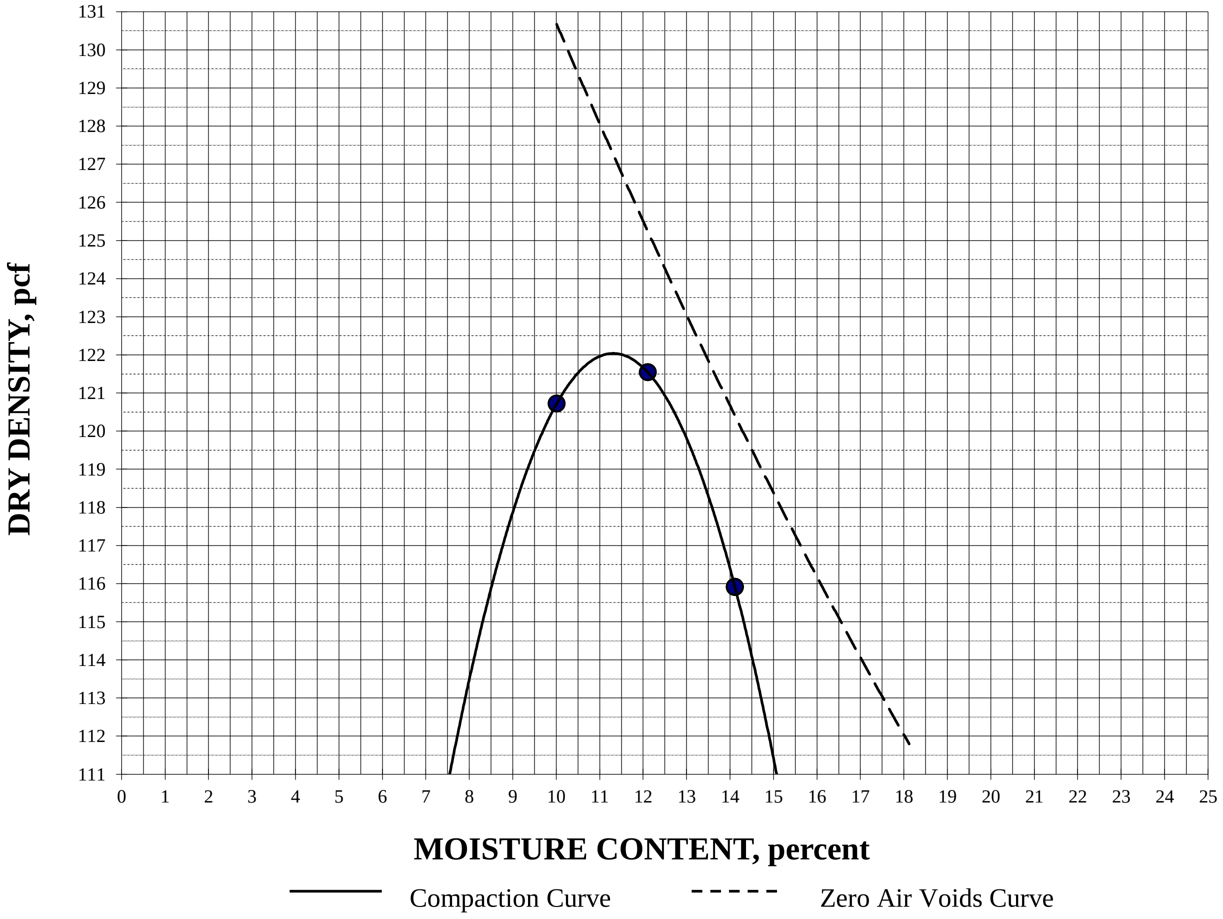
SPECIFIC GRAVITY: 2.65 (assumed)

SIEVE DATA:

Sieve Size	% Retained (Cumulative)
3/4"	0
3/8"	0
#4	1

MAXIMUM DRY DENSITY: 122.0 pcf

OPTIMUM MOISTURE: 11.3%



MOISTURE-DENSITY COMPACTION TEST

ASTM D 1557-12 (Modified)

PROCEDURE USED: A

January 24, 2023

PREPARATION METHOD: Moist

Boring #11 @ 3.0 - 8.0'

RAMMER TYPE: Mechanical

Brown Poorly Graded Sand with Silt (SP-SM)

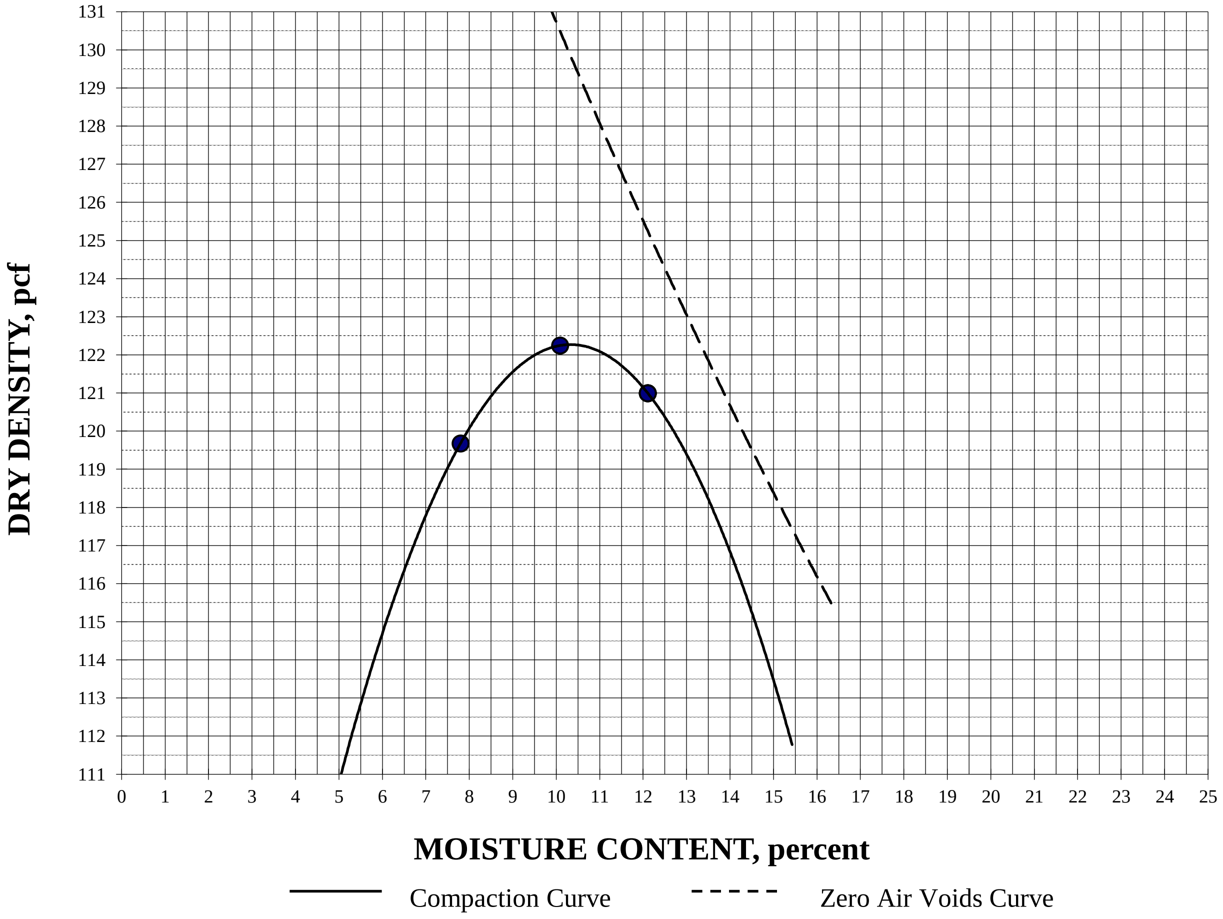
SPECIFIC GRAVITY: 2.65 (assumed)

SIEVE DATA:

Sieve Size	% Retained (Cumulative)
3/4"	0
3/8"	0
#4	1

MAXIMUM DRY DENSITY: 122.3 pcf

OPTIMUM MOISTURE: 10.3%



Greenfield WWTP Upgrades 305748-001

DIRECT SHEAR

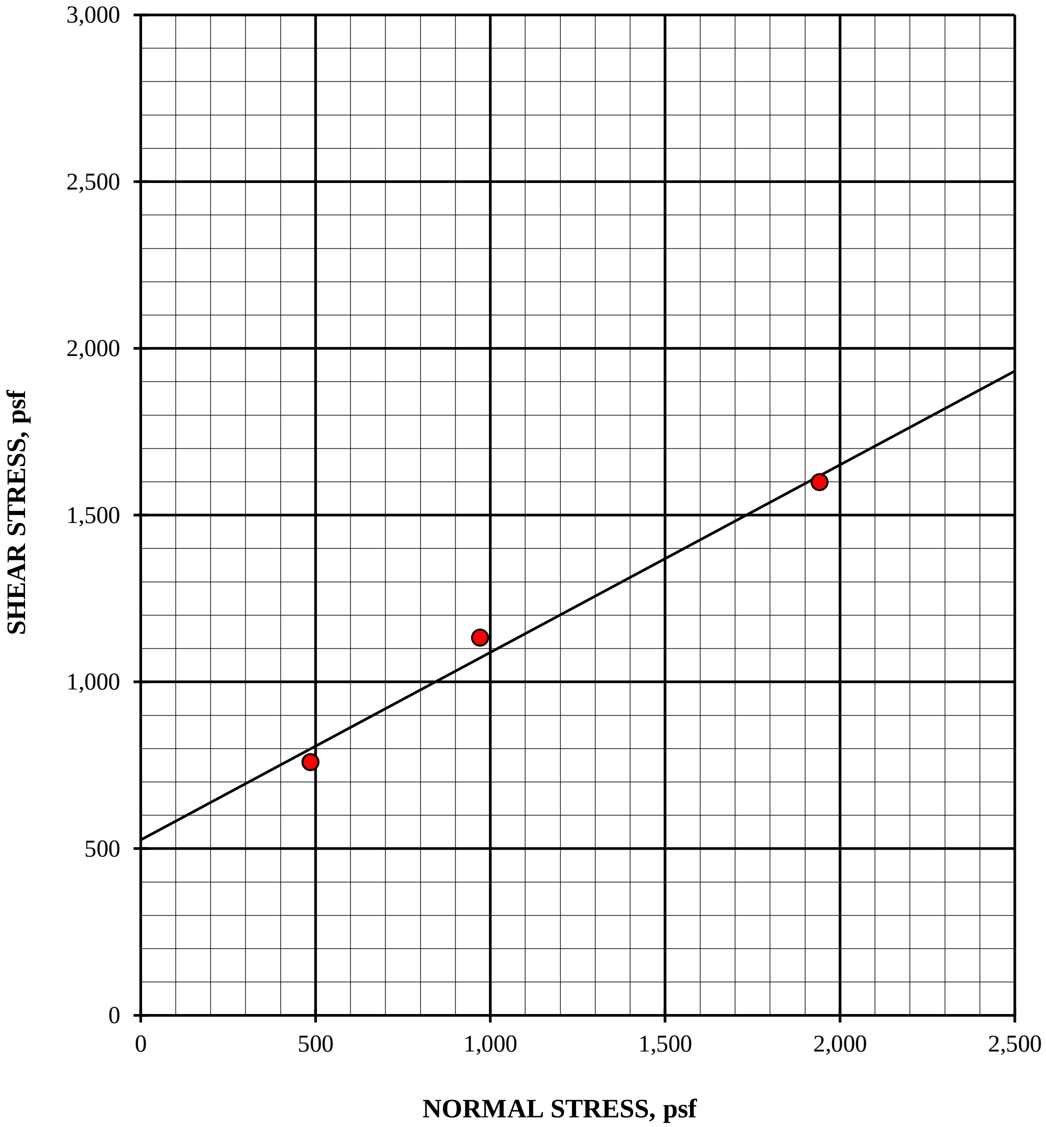
ASTM D 3080/D3080M-11 (modified for consolidated, undrained conditions)

January 24, 2023

Boring #11 @ 3.0 - 8.0'
Poorly Graded Sand with Silt (SP-SM)
Compacted to 90% RC, saturated

INITIAL DRY DENSITY: 110.0 pcf
INITIAL MOISTURE CONTENT: 10.3 %
PEAK SHEAR ANGLE (Ø): 29°
COHESION (C): 526 psf

SHEAR vs. NORMAL STRESS



DIRECT SHEAR continued

ASTM D 3080/D3080M-11 (modified for consolidated, undrained conditions)

Boring #11 @ 3.0 - 8.0'

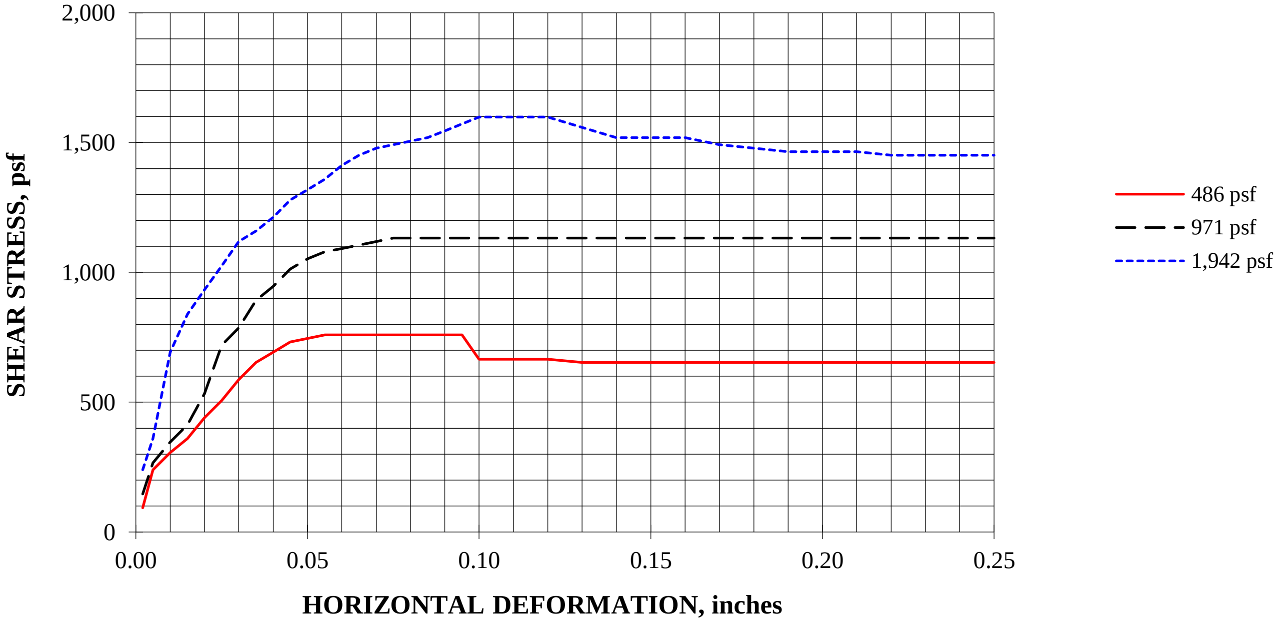
January 24, 2023

Poorly Graded Sand with Silt (SP-SM)

Compacted to 90% RC, saturated

SPECIFIC GRAVITY: 2.65 (assumed)

SAMPLE NO.:	1	2	3	AVERAGE
INITIAL				
WATER CONTENT, %	10.3	10.3	10.3	10.3
DRY DENSITY, pcf	110.0	110.0	110.0	110.0
SATURATION, %	54.3	54.3	54.3	54.3
VOID RATIO	0.503	0.503	0.503	0.503
DIAMETER, inches	2.410	2.410	2.410	
HEIGHT, inches	1.00	1.00	1.00	
AT TEST				
WATER CONTENT, %	18.7	17.9	17.2	
DRY DENSITY, pcf	111.4	113.7	116.1	
SATURATION, %	100.0	100.0	100.0	
VOID RATIO	0.485	0.455	0.425	
HEIGHT, inches	0.99	0.97	0.95	



APPENDIX C

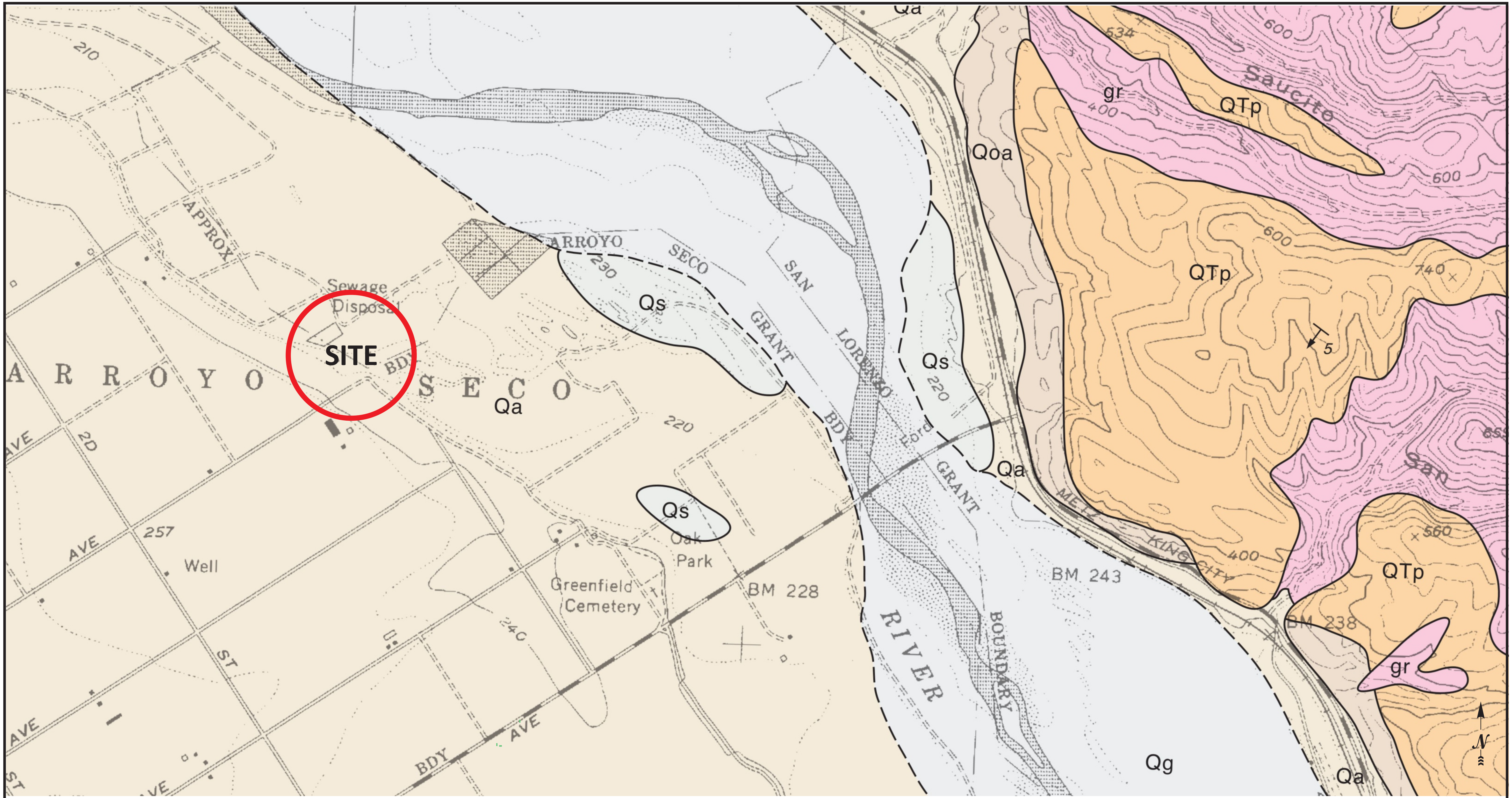
Figure 3a – Regional Geologic Map

Figure 3b – Regional Geologic Map Legend

Figure 4 – Historical Seismicity Map

Figure 5 – FEMA Flood Zone Map

Figure 6 – Indoor Radon Potential Map



Approximate Scale: 1' = 1,000 feet, Source: Dibblee, Thomas W. Jr., 2007, Geologic Map of the Orchard Peak Quadrangle, DF-307

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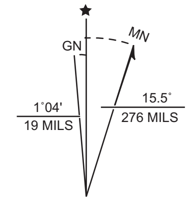
Regional Geologic Map

Greenfield Wastewater Treatment Plant Upgrade
41901 Walnut Avenue
Greenfield, California

Figure 3a

Date
March 2023

Project No.
305748-001



UTM GRID AND 1984 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

CONTOUR INTERVAL 40 FEET
DOTTED LINES REPRESENT 10-FOOT CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

GEOLOGIC MAP OF THE GREENFIELD QUADRANGLE

MONTEREY COUNTY, CALIFORNIA

BY THOMAS W. DIBBLEE, JR., 2007

Dibblee Geology Center Map #DF-307: First Printing, April 2007
SANTA BARBARA MUSEUM OF NATURAL HISTORY
2559 PUESTA DEL SOL ROAD, SANTA BARBARA, CA 93105
HTTP://WWW.SBNATURE.ORG/

LEGEND

Qa | Qg | Qs

SURFICIAL SEDIMENTS

Qg Sand and gravel of Salinas River channel
Qa Alluvial gravel, sand and silt/clay of valley areas and stream channels
Qs Dune sand

Qoa

OLDER SURFICIAL SEDIMENTS

Qoa Older dissected alluvial terrace sediments, undeformed, age-late Pleistocene

QTp
Qcs

PASO ROBLES FORMATION

Valley sediments. weakly indurated; age, Pleistocene and possibly latest Pliocene

QTp Alluvial pebble conglomerate of siliceous shale detritus (from Monterey Formation) in sandy to clayey matrix, light gray
Qcs Sand & clay

LOCAL UNCONFORMITY

Tpo and Tpd

PANCHO RICO FORMATION

Marine clastic to sub-biogenic, sublithified; age, upper Miocene

Tpo and Tpd Siltstone, light gray, diatomaceous mudstone to fine grained silty sandstone, interfased, vaguely bedded

Tm

MONTEREY FORMATION

Marine biogenic to subclastic, lithified; age, Miocene

Tm Upper part. siliceous shale, white weathered, thin bedded, hard, platy, porcelaneous to locally cherty, brittle, much fractured; age, upper Miocene (Mohnian Stage)

INDEX TO ADJACENT 7.5 MINUTE QUADRANGLES

1	2	3
4		5
6	7	8

1 Soledad, DF-245
2 North Chalone Peak, DF-303
3 Topo Valley, DF-304
4 Paraiso Springs, DF-247
5 Pinalito Canyon, DF-308
6 Reliz Canyon, DF-249
7 Thompson Canyon, DF-250
8 San Lucas, DF-251

Td

VOLCANIC ROCKS

age, Miocene

Td Intrusive and extrusive felsite (dacite, rhyolite, and andesite)

UNCONFORMITY

gr

GRANITIC ROCKS

Part of plutonic basement of Salinian block; age, late Mesozoic (Cretaceous?)

gr Ranges from quartz diorite to granodiorite, light gray, medium grained, holocrystalline, massive, of quartz, potassic feldspar and sodic plagioclase in nearly equal amounts to predominance of plagioclase; and small to moderate amounts of biotite mica (Ross, 1972)

ms | ml

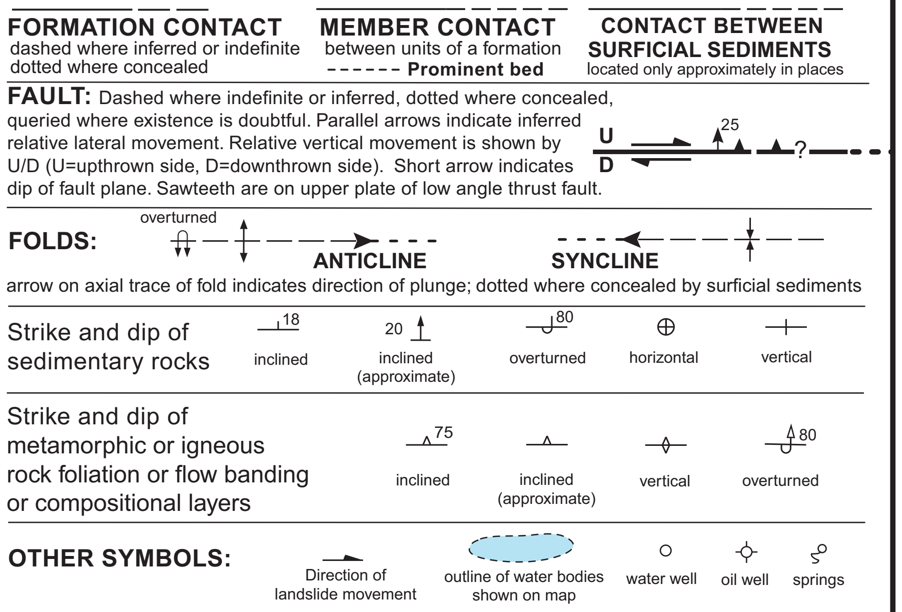
METASEDIMENTARY ROCKS

Part of Sur Series of Trask, 1926; age, Mesozoic or Paleozoic

ms Mica schist, dark gray, fine grained, foliated, of biotite and grains of quartz and feldspar, ranges to gneiss
ml Marble, white, coarse crystalline

GEOLOGIC SYMBOLS

not all symbols shown on each map



FORMATION CONTACT
dashed where inferred or indefinite
dotted where concealed

MEMBER CONTACT
between units of a formation
------ **Prominent bed**

CONTACT BETWEEN SURFICIAL SEDIMENTS
located only approximately in places

FAULT: Dashed where indefinite or inferred, dotted where concealed, queried where existence is doubtful. Parallel arrows indicate inferred relative lateral movement. Relative vertical movement is shown by U/D (U=upthrown side, D=downthrown side). Short arrow indicates dip of fault plane. Sawteeth are on upper plate of low angle thrust fault.

FOLDS: overturned **ANTICLINE** **SYNCLINE**

arrow on axial trace of fold indicates direction of plunge; dotted where concealed by surficial sediments

Strike and dip of sedimentary rocks

Strike and dip of metamorphic or igneous rock foliation or flow banding or compositional layers

OTHER SYMBOLS:

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www.earthsystems.com - email: esp@earthsystems.com

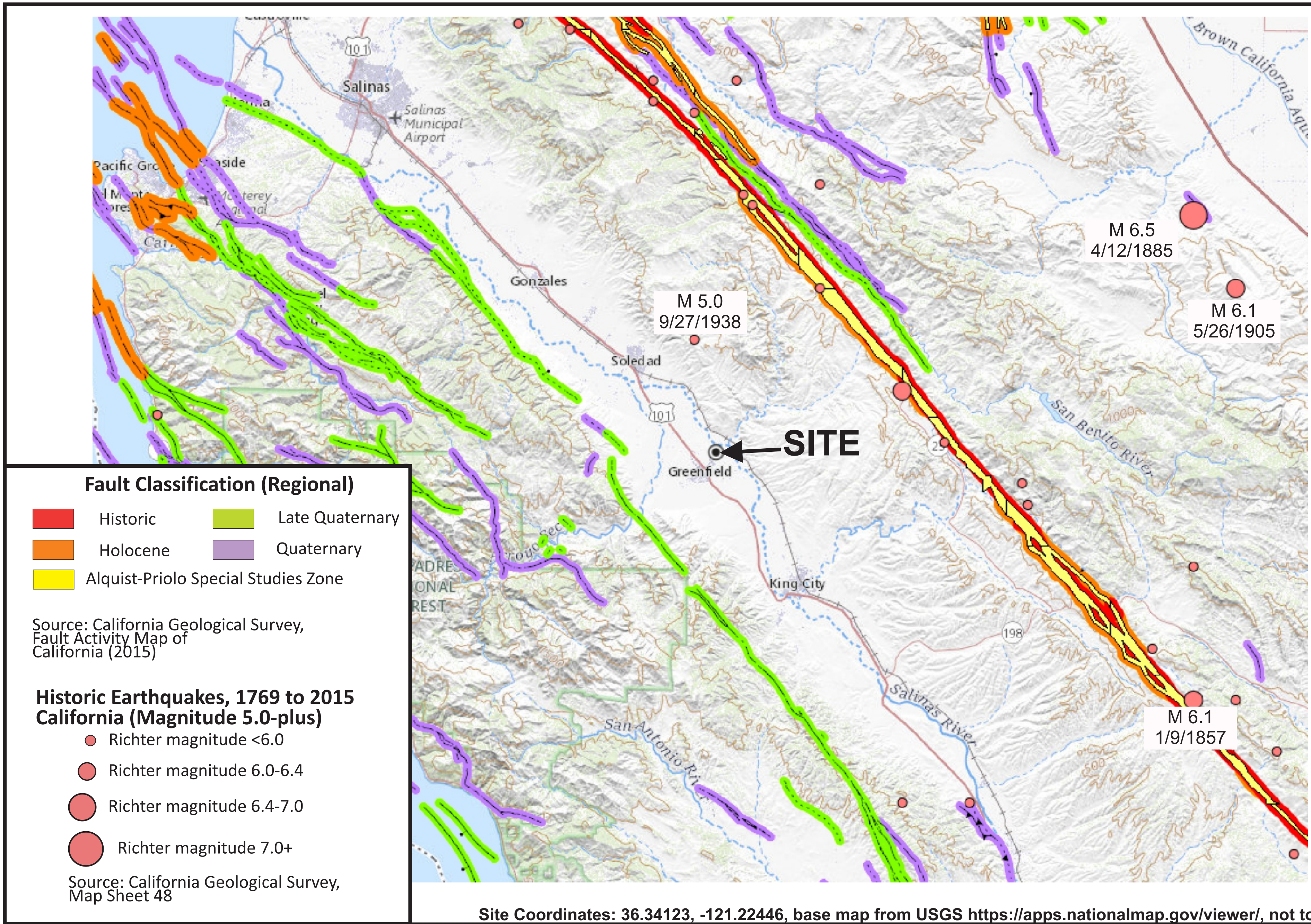
Regional Geologic Map Legend

Greenfield Wastewater Treatment Plant Upgrade
41901 Walnut Avenue
Greenfield, California

Figure 3b

Date
March 2023

Project No.
305748-001



Source: California Geological Survey, Fault Activity Map of California (2015)

Source: California Geological Survey, Map Sheet 48

Site Coordinates: 36.34123, -121.22446, base map from USGS https://apps.nationalmap.gov/viewer/, not to scale

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HISTORICAL SEISMICITY MAP

Greenfield Wastewater Treatment Plant Upgrade
41901 Walnut Avenue
Greenfield, California

FIGURE 4

Date
March 2023

Project No.
305748-001

National Flood Hazard Layer FIRMette

FEMA

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS	🟦	Without Base Flood Elevation (BFE) *Zone A, V, A99* With BFE or Depth *Zone AE, AO, AH, VE, AR*
	▨	Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD	🟧	0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
	▨	Future Conditions 1% Annual Chance Flood Hazard *Zone X*
	▨	Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
	▨	Area with Flood Risk due to Levee *Zone D*
OTHER AREAS	NO SCREEN	Area of Minimal Flood Hazard *Zone X*
	☐	Effective LOMRs
	🟧	Area of Undetermined Flood Hazard *Zone D*
GENERAL STRUCTURES	— — —	Channel, Culvert, or Storm Sewer
	IIIIIII	Levee, Dike, or Floodwall
OTHER FEATURES	B 20.2 17.5	Cross Sections with 1% Annual Chance Water Surface Elevation
	8 — — —	Coastal Transect
	~~ 513 ~~~	Base Flood Elevation Line (BFE)
	—	Limit of Study
	—	Jurisdiction Boundary
	--- ---	Coastal Transect Baseline
	- —	Profile Baseline
	—	Hydrographic Feature
MAP PANELS	☐	Digital Data Available
	☐	No Digital Data Available
	☒	Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

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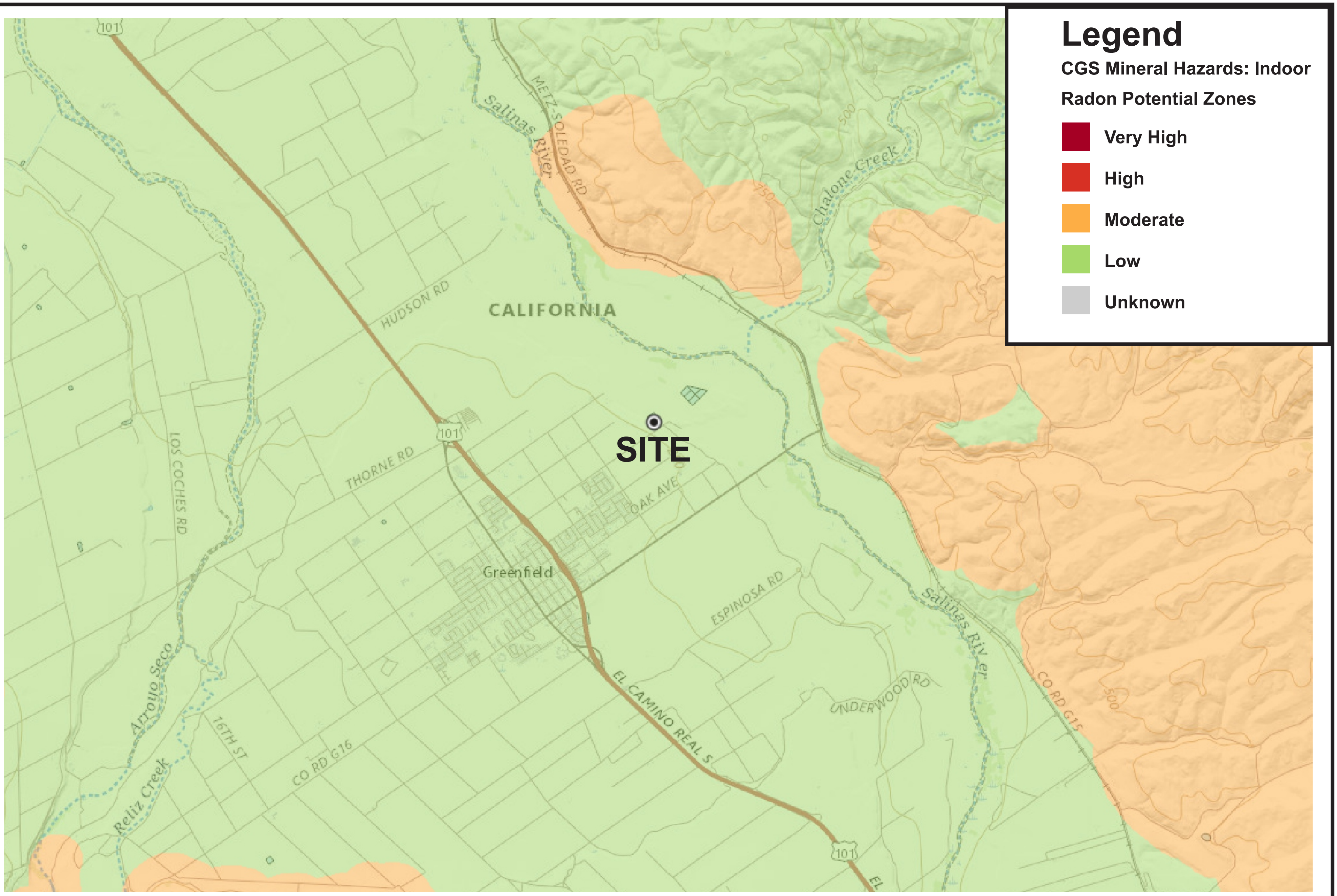
FEMA FLOOD ZONE MAP

Greenfield Wastewater Treatment Plant Upgrade
41901 Walnut Avenue
Greenfield, California

FIGURE 5

Date
March 2023

Project No.
305748-001



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INDOOR RADON POTENTIAL MAP

Greenfield Wastewater Treatment Plant Upgrade
41901 Walnut Avenue
Greenfield, California

FIGURE 6

Date
March 2023

Project No.
305748-001

APPENDIX D

Table D-1
Fault Parameters

Fault Section Name	**Distance** (miles)	(km)	Upper Seis. Depth (km)	Lower Seis. Depth (km)	Avg Dip Angle (deg.)	Avg Dip Direction (deg.)	Avg Rake (deg.)	Trace Length (km)	Fault Type	**Mean Mag**	Mean Return Interval (years)	Slip Rate (mm/yr)
Reliz 2011 CFM FM3.1, 3.2	6.3	10.2	0.0	10.9	58	240	na	127	B'	**7.4**		
Rinconada 2011 CFM FM3.1, 3.2	9.2	14.8	0.0	8.5	82	233	180	123	B	**7.5**		1
San Andreas (Creeping Section) FM3.1, 3.2	13.2	21.3	0.0	12.0	90	227	180	121	A	**6.8**	89	9
Calaveras (So) - Paicines extension FM3.1, 3.2	15.0	24.1	0.0	13.0	77	na	na	60	B'	**7.0**		
Monterey Bay-Tularcitos FM3.1, 3.2	15.5	25.0	0.0	14.0	90	49	150	86	B	**7.3**		0.5
Quien Sabe 2011 CFM FM3.1, 3.2	28.6	46.0	0.0	10.1	85	54	180	25	B	**6.5**		1
San Gregorio (South) 2011 CFM FM3.1, 3.2	29.6	47.7	0.0	11.6	75	66	180	90	B'	**7.2**		
Ortigalita (South) FM3.1, 3.2	29.7	47.8	0.0	11.0	90	na	na	62	B'	**6.9**		
Hosgri FM3.1, 3.2	31.2	50.2	0.0	6.8	80	59	180	171	B	**7.3**		2.5
Zayante-Vergeles FM3.2	33.9	54.5	0.0	12.0	90	36	150	58	B	**7.0**		0.1
Zayante-Vergeles 2011 CFM, FM3.1	34.5	55.4	0.0	11.8	30	211	na	90	B'	**7.5**		
San Andreas (Santa Cruz Mtn) FM3.1, 3.2	34.9	56.1	0.0	15.0	79	42	180	63	A	**7.6**	219	24
Calaveras (So) 2011 CFM FM3.1, 3.2	35.7	57.4	0.0	9.5	85	71	180	26	A	**6.0**	20	6
Great Valley 11 FM3.1, 3.2	37.9	60.9	7.0	9.6	15	221	90	24	B	**6.5**		1.5
Sargent 2011 CFM FM3.1, 3.2	38.0	61.2	0.0	12.0	90	na	na	57	B'	**6.9**		
Great Valley 10 Panoche FM3.1, 3.2	38.4	61.9	7.0	9.6	15	242	90	22	B	**6.4**		1.5
Great Valley 9 Laguna Seca FM3.1, 3.2	41.7	67.0	7.0	9.6	15	237	90	39	B	**6.7**		1.5
San Andreas (Parkfield) FM3.1, 3.2	43.8	70.4	0.0	10.2	90	50	180	36	A	**6.4**	13	20
Great Valley 12 FM3.1, 3.2	44.7	72.0	7.0	9.6	15	243	90	17	B	**6.3**		1.5
Oceanic-West Huasna FM3.1, 3.2	45.4	73.1	0.0	7.0	58	49	na	122	B'	**7.1**		
Ortigalita (North) FM3.1, 3.2	46.8	75.2	0.0	11.0	90	240	180	40	B	**7.0**		1
Great Valley 13 (Coalinga) FM3.1, 3.2	48.2	77.6	9.1	15.2	15	226	90	32	B	**7.0**		1.5
Calaveras (Central) 2011 CFM FM3.1, 3.2	52.0	83.7	0.0	11.0	77	239	180	52	A	**6.4**	39	#N/A
Great Valley 8 V	53.5	86.0	7.0	9.6	15	249	90	41	B	**6.7**		1.5
San Juan FM3.1, 3.2	60.8	97.9	0.0	13.0	90	243	180	82	B	**7.1**		1
Silver Creek 2011 CFM FM3.1, 3.2	61.8	99.4	0.0	11.1	75	na	na	48	B'	**6.8**		
Great Valley 14 (Kettleman Hills) FM3.1, 3.2	62.2	100.0	8.1	22.5	22	215	90	24	B	**7.1**		1.5
San Gregorio (North) 2011 CFM FM3.1, 3.2	63.7	102.5	0.0	11.6	90	248	180	129	B'	**7.3**		
Greenville (So) FM3.1, 3.2	64.5	103.8	0.0	10.6	87	242	180	29	B'	**6.6**		
San Andreas (Cholame) rev FM3.1, 3.2	65.7	105.8	0.0	12.0	90	51	180	63	A	**6.8**	89	3.5
Monte Vista-Shannon 2011 CFM FM3.1, 3.2	65.8	105.9	0.0	14.2	61	215	90	60	B	**6.4**		0.4
Hayward (So) extension FM3.1, 3.2	66.3	106.6	0.0	5.1	48	na	na	23	B'	**6.3**		
Butano 2011 CFM FM3.1, 3.2	66.5	106.9	0.0	12.0	70	na	na	46	B'	**6.9**		
Los Osos 2011 CFM FM3.1, 3.2	68.8	110.8	0.0	12.0	45	208	90	58	B	**6.9**		0.5
La Panza FM3.1, 3.2	70.1	112.8	0.0	13.9	51	45	na	72	B'	**7.3**		
San Andreas (Peninsula) FM3.1, 3.2	71.9	115.7	0.0	13.0	90	54	180	100	A	**7.9**	354	34
Shoreline FM3.1, 3.2	76.6	123.3	0.0	12.0	90	na	na	23	B'	**6.5**		
Great Valley 7 FM3.1, 3.2	76.9	123.8	7.0	9.6	15	224	90	45	B	**6.8**		1.5
Hayward (So) FM3.1, 3.2	79.6	128.1	0.0	13.4	76	52	180	54	A	**6.8**	89	6
San Luis Bay 2011 CFM FM3.2	81.5	131.1	0.0	10.0	90	na	na	16	B'	**6.3**		

Reference: USGS OFR 2013-1165 (CGS SP 228)

Based on Site Coordinates of 36.34123 Latitude, -121.22446 Longitude

Mean Magnitude for Type A Faults based on 0.1 weight for unsegmented section, 0.9 weight for segmented model (weighted by probability of each scenario with section listed as given on Table 3 of Appendix G in OFR 2008-1437). Mean magntude is average of Ellworths-B and Hanks & Bakun moment area relationship.

Site Coordinates: 36.341 N 121.224 W

Table D-2

Historical Earthquakes in Vicinity of Project Site, M >= 5.5

		Epicenter		*Distance*	
		Latitude	*Longitude*	*from*	*Magnitude*
Day	*Year*	*(Degrees)*		*Site (mi)*	M_W
7/4	2005	36.34	121.23	0.3	**5.7**
3/6	1882	36.50	121.10	13.0	**5.9**
4/17	1860	36.35	120.95	15.3	**6.0**
4/2	1885	36.60	121.10	19.2	**5.9**
1/9	1857	36.29	120.85	21.1	**5.6**
8/6	1916	36.67	121.25	22.7	**5.8**
4/9	1961	36.68	121.30	23.8	**5.5**
9/2	1853	36.25	120.80	24.4	**6.3**
3/31	1885	36.70	121.20	24.8	**5.7**
4/9	1961	36.70	121.30	25.1	**5.5**
1/9	1857	36.20	120.80	25.6	**7.9**
4/12	1885	36.20	120.80	25.6	**6.5**
3/25	1903	36.10	121.60	26.7	**5.9**
11/13	1892	36.75	121.40	29.9	**5.9**
1/14	1855	36.15	120.70	32.1	**5.5**
7/29	*1841	36.80	121.45	34.1	**5.8**
6/24	1939	36.80	121.45	34.1	**5.5**
3/30	*1883	36.80	121.50	35.2	**6.0**
1/9	1857	36.10	120.65	36.1	**6.1**
5/26	1905	36.50	120.60	36.4	**6.1**
7/3	*1841	36.83	121.50	36.7	**6.0**
1/18	1840	36.85	121.50	38.3	**6.5**
7/6	*1899	36.90	121.40	39.8	**5.8**
11/22	1952	35.76	121.27	40.2	**6.2**
4/30	*1899	36.85	121.60	40.8	**6.0**
10/11	1800	36.87	121.57	41.2	**5.5**
6/10	*1836	36.90	121.50	41.5	**6.4**
2/2	1881	36.05	120.55	42.6	**6.0**
5/6	1881	36.05	120.55	42.6	**5.5**
4/15	*1889	36.95	121.40	43.1	**5.5**
4/24	*1890	36.90	121.60	43.8	**6.3**
4/25	1954	36.90	121.61	44.1	**5.6**
2/1	1853	35.70	121.10	44.8	**5.5**
12/22	2003	35.70	121.10	44.8	**6.6**
12/27	1926	36.40	120.40	46.0	**5.5**
3/3	1901	36.00	120.50	46.8	**6.4**
7/25	1926	36.50	120.40	47.1	**5.8**
7/22	1983	36.26	120.38	47.3	**5.7**
6/20	1897	37.00	121.50	48.0	**6.3**
3/11	*1910	36.95	121.70	49.6	**5.8**

From full earthquake catalog in USGS OFR 2008-1437h as updated with current events through 2022 (ANSS 2022). For events with an asterisk, alternate solutions are given in the OFR. Ordered By Closest Event. Maximum 40 Closest Events

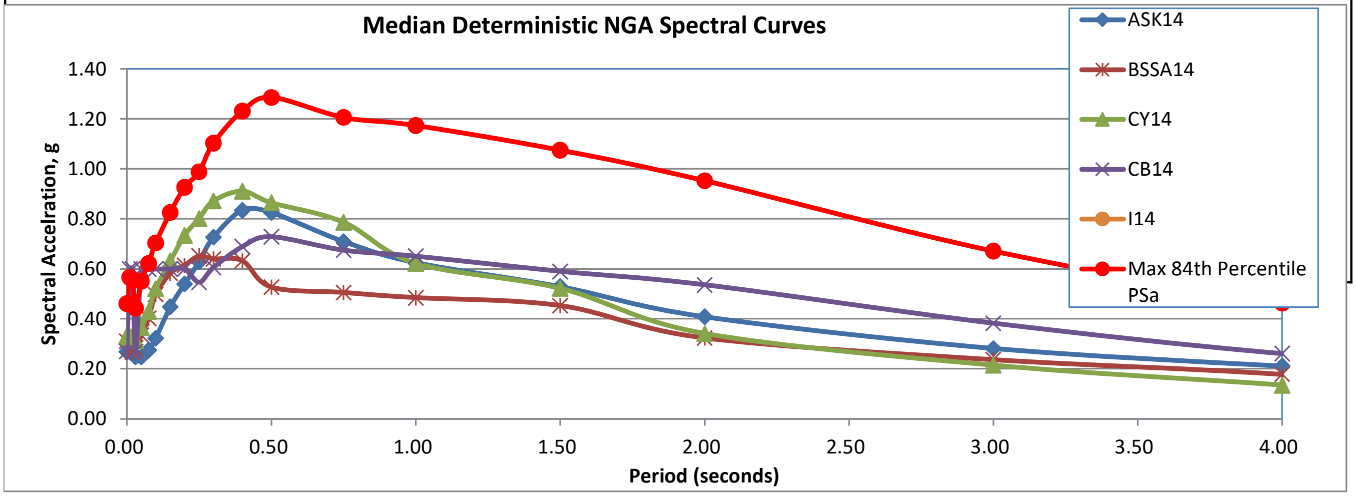
36.3412 -121.22446 Lat/Long

Table D-3 - Deterministic Spectral Response Values
Deterministic NGA Response Spectra for Largest Median Earthquake Ground Motion

Average of NGA: Abrahamson - Silva - Kamai (2014), Boore - Stewart - Seyhan - Atkinson (2013),
Campbell-Bozorgnia (2013), Chiou - Youngs (2014), and Idriss (2013)

Mean Spectra Response from Attentuation Relationships

	ASK14		BSSA14	CB14	CY14	I14	Average			
Input Variables	**Period (sec)**	Median PSa (g)	Median PSa (g)	Median PSa (g)	Median PSa (g)	Median PSa (g)	**Period (sec)**	Mean PSa (g)	Max 84th Percentile PSa (g)	**Max Rotated Determ. PSa**
	Weight:	**0.25**	**0.25**	**0.25**	**0.25**	**0.00**				
M	**0.00**	0.27	0.30	0.27	0.33	-	**0.00**	0.294	0.461	**0.507**
7.44	**0.01**	0.27	0.31	0.60	0.33	-	**0.01**	0.378	0.566	**0.623**
R_{RUP}	**0.02**	0.27	0.29	0.60	0.33	-	**0.02**	0.370	0.555	**0.611**
10.20	**0.03**	0.25	0.27	0.27	0.33	-	**0.03**	0.279	0.443	**0.487**
R_{JB}	**0.05**	0.25	0.28	0.60	0.31	-	**0.05**	0.361	0.550	**0.605**
10.20	**0.075**	0.28	0.34	0.60	0.37	-	**0.075**	0.394	0.622	**0.684**
V_{S30}	**0.10**	0.32	0.40	0.60	0.43	-	**0.10**	0.438	0.704	**0.774**
150	**0.15**	0.45	0.50	0.60	0.52	-	**0.15**	0.517	0.826	**0.908**
F_{RV}	**0.20**	0.54	0.58	0.60	0.63	-	**0.20**	0.588	0.927	**1.019**
0	**0.25**	0.63	0.61	0.55	0.73	-	**0.25**	0.631	0.988	**1.134**
F_{NM}	**0.30**	0.73	0.65	0.61	0.80	-	**0.30**	0.697	1.103	**1.277**
0	**0.40**	0.83	0.64	0.69	0.87	-	**0.40**	0.759	1.231	**1.450**
W	**0.50**	0.83	0.63	0.73	0.91	-	**0.50**	0.774	1.286	**1.541**
12.90	**0.75**	0.71	0.53	0.68	0.86	-	**0.75**	0.694	1.206	**1.506**
Z_{TOR}	**1.00**	0.62	0.51	0.65	0.79	-	**1.00**	0.642	1.174	**1.526**
0.00	**1.50**	0.53	0.48	0.59	0.62	-	**1.50**	0.556	1.075	**1.424**
Z_{BOT}	**2.00**	0.41	0.45	0.54	0.52	-	**2.00**	0.480	0.952	**1.286**
10.90	**3.00**	0.28	0.32	0.38	0.34	-	**3.00**	0.332	0.671	**0.940**
dip	**4.00**	0.21	0.24	0.26	0.22	-	**4.00**	0.231	0.464	**0.672**
58	**5.00**	0.16	0.18	0.18	0.13	-	**5.00**	0.164	0.329	**0.493**
	7.50	0.09	0.09	0.08	0.05	-	**7.50**	0.078	0.154	**0.230**
	10.00	0.06	0.05	0.04	0.03	-	**10.00**	0.043	0.081	**0.121**



36.34123 -121.22446 Lat/Long

Table D-4 - Site Specific Spectral Response Values
Probabilistic and Deterministic Response Spectra for MCE compared to Code Spectra
for 5% Viscous Damping Ratio

	GeoMean Probab. 2% in 50 year MCE Spectrum	Max Rotated Probab. 2% in 50 year MCEr Spectrum	Max Rotated 84th Percentile Determ. MCE Spectrum	Determ. Lower Limit MCE Spectrum	Determ. MCE Spectrum	Site Specific MCE, Ground Response (SaM)	Site Specific MCE Spectrum Comparator	2019 CBC MCE Spectrum	Site Specific Design Spectrum (Sa)	2019 CBC Design Spectrum
Natural Period T (seconds)	(1)	(2)	(3)	(4)	(5)	(6)	(6b)	(7)	(8)	(9)
	2475-year	2475-year		(3) * 1.00=Scaling	Max (3),(4)	Min (2),(5)	Max (6),1.5*(8)			2/3*(7)
	(ASCE 21.2.1)	(ASCE 21.2.1.1)	(ASCE 21.2.2)	(ASCE 21.2.2)	(ASCE 21.2.2)	(ASCE 21.2.3)	(ASCE 21.2.3)		(ASCE 21.3)	
0.00	0.720	0.777	0.507	0.507	0.507	0.507	0.507	0.600	0.338	0.400
0.05	1.004	1.083	0.605	0.605	0.605	0.605	0.605	0.747	0.403	0.498
0.10	1.288	1.390	0.774	0.774	0.774	0.774	0.774	0.895	0.516	0.596
0.15	1.485	1.602	0.908	0.908	0.908	0.908	0.908	1.042	0.605	0.695
0.20	1.625	1.753	1.019	1.019	1.019	1.019	1.019	1.189	0.679	0.793
0.30	1.867	2.109	1.277	1.277	1.277	1.277	1.277	1.484	0.851	0.989
0.40	1.881	2.153	1.450	1.450	1.450	1.450	1.450	1.500	0.967	1.000
0.50	1.893	2.193	1.541	1.541	1.541	1.541	1.541	1.500	1.027	1.000
0.75	1.605	1.916	1.506	1.506	1.506	1.506	1.506	1.500	1.004	1.000
1.00	1.401	1.720	1.526	1.526	1.526	1.526	1.526	1.500	1.017	1.000
1.50	1.099	1.375	1.424	1.424	1.424	1.375	1.375	1.500	0.917	1.000
2.00	0.885	1.128	1.286	1.286	1.286	1.128	1.128	1.146	0.752	0.764
3.00	0.604	0.798	0.940	0.940	0.940	0.798	0.798	0.764	0.532	0.509
4.00	0.438	0.599	0.672	0.672	0.672	0.599	0.599	0.573	0.400	0.382
5.00	0.332	0.470	0.493	0.493	0.493	0.470	0.470	0.458	0.313	0.306
8.00	0.211	0.298	0.270	0.270	0.270	0.270	0.270	0.287	0.180	0.191
10.00	0.190	0.269	0.121	0.121	0.121	0.121	0.183	0.229	0.122	0.153
12.00	0.183	0.259	0.076	0.076	0.076	0.076	0.153	0.191	0.102	0.127

C_{RS}:	0.981	
C_{R1}:	0.944	
Site Specific To:	0.346	$= 0.2*S_{D1}/S_{DS}$
Site Specific Ts:	1.729	$= S_{D1}/S_{DS}$

The value of Fa used in Column (3) is defined within ASCE 21.2.2 Supplement 1. This Fa value only applies within Column (3).

Site Coefficients	
F_{PGA}	1.18
F_a	1.00
F_v	4.00

Probabilistic spectrum from 2014 USGS Ground Motion Mapping Program adjusted for site conditions and scaled to represent maximum response in a horizontal plane, in accordance with ASCE 7-16 Section 21.2

Mapped MCE Acceleration Values		
PGA	0.522	g
S_S	1.500	g
S_1	0.573	g

Risk Coefficients have been applied to Column (2); If Method 1 was utilized the Risk Coefficients, CRS and CR1 are presented above, if Method 2 was utilized the Risk Coefficients were obtained from the USGS Risk Targeted Ground Motion Calculator (https://earthquake.usgs.gov/designmaps/rtgm).

Seismic Site Class	**E**
Risk Category	**II**

Reference: ASCE 7-16, Chapters 21.2, 21.3, 21.4, 21.5, 11.4, and 11.8

Calculation Utilized ASCE7-16, Section 21.2.1.1 - Method 1

Short-Period Seismic Design Category:	**1-Second Period Seismic Design Category:**
D	D

Site-Specific Design Acceleration Values		
$\mathbf{PGA_M}$	**0.600**	**g**
$\mathbf{S_{DS}}$	**0.924**	**g**
$\mathbf{S_{D1}}$	**1.598**	**g**

Vertical Coefficient (C_V)
1.40

Deterministic Fault Parameters			
Reliz 2011 CFM FM3.1, 3.2		R_{JB} (km)	10.2
Magnitude	7.44	R_{RUP} (km)	10.2
Distance (km)	10.2	Z_{TOR} (km)	0.0
Width (km)	12.9	Z_{BOT} (km)	10.9
Dip (Deg.)	58	V_{S30} (m/s)	150

Site-Specific $\mathbf{MCE_R}$, 5% damped, Spectral Response Acceleration Parameter		
$\mathbf{S_{MS}}$	**1.387**	**g**
$\mathbf{S_{M1}}$	**2.398**	**g**

1 g = 980.6 cm/sec^2 =32.2 ft/sec^2

PSV (ft/sec) = 32.2(S_a)T/(2p)

Key: Probab. = Probabilistic, Determ. = Deterministic, MCE = Maximum Considered Earthquake

Table D-5 - General Procedure Seismic Design Values

2022 California Building Code (CBC) (ASCE 7-16) Seismic Design Parameters

(Values presented should only be used by a Structural Engineer to determine if the exception in 11.4.8 (ASCE 7-16) can be used)

Seismic Design Category		**D**	CBC Reference	ASCE 7-16 Reference
Site Class		**E**	Table 1613.5.6	Table 11.6-1
Latitude:		36.341	Table 1613.5.2	Table 20.3-1
Longitude:		-121.224		

Maximum Considered Earthquake (MCE) Ground Motion

Short Period Spectral Reponse	**S_S**	**1.500 g**	Figure 1613.5	Figure 22-1
1 second Spectral Response	**S_1**	**0.573 g**	Figure 1613.5	Figure 22-2
Site Coefficient	F_a	1.20 **	Table 1613.5.3(1)	Table 11.4-1
Site Coefficient	F_v	2.05	Table 1613.5.3(2)	Table 11-4.2
	S_{MS}	1.800 g	$= F_a*S_S$	
	S_{M1}	1.177 g	$= F_v*S_1$	

****Exception of ASCE7-16, Section 11.4.8, Exception Note 1 Applied as Site Class is E, Ss >= 1.0, and therefore Fa was taken to be equal to that of Site Class C.**

Design Earthquake Ground Motion

Short Period Spectral Reponse	**S_{DS}**	**1.200 g**	$= 2/3*S_{MS}$
1 second Spectral Response	**S_{D1}**	**0.785 g**	$= 2/3*S_{M1}$

Site Specific Evaluation May Be Required Due to Site Class = D or E and S1>=0.2. The Presented SDS and SD1 are NOT Valid Unless the Exception of ASCE7-16, Section 11.4.8 Applies

Site Specific Evaluation May Be Required Due to Site Class = E and Ss>=1.0. The Presented SDS and SD1 are NOT Valid Unless the Exception of ASCE7-16, Section 11.4.8 Applies

To	0.13 sec	$= 0.2*S_{D1}/S_{DS}$
Ts (11.4.8 ASCE 7-16 Exception Assumed)	0.65 sec	$= S_{D1}/S_{DS}$
Risk Category	II	Table 1604.5
Seismic Importance Factor	1.00	
F_{PGA}	1.18	
PGA_M	**0.61**	
Vertical Coefficient (C_V)	1.40	Table 11.9-1

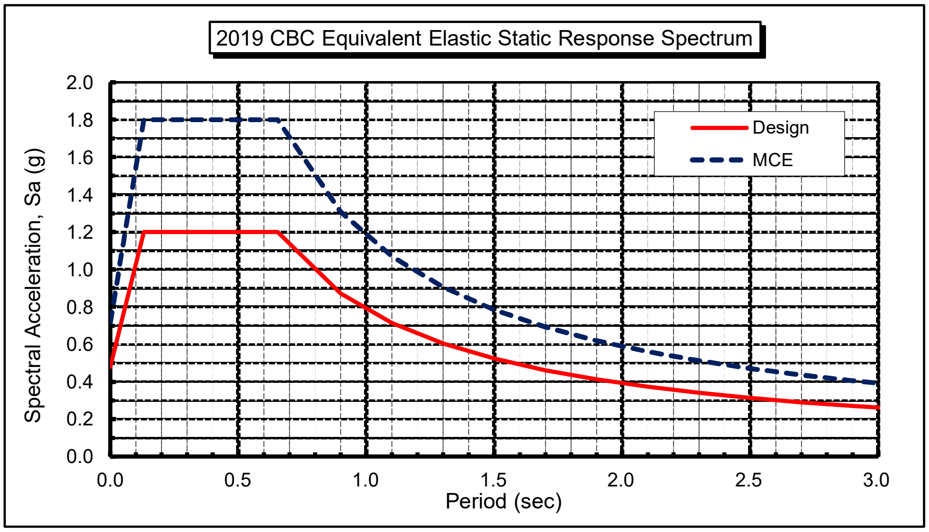


Table 11.5-1	Design
Period T (sec)	Sa (g)
0.00	0.480
0.05	0.755
0.13	1.200
0.65	1.200
0.90	0.872
1.10	0.713
1.30	0.604
1.50	0.523
1.70	0.462
1.90	0.413
2.10	0.374
2.30	0.341
2.50	0.314
2.70	0.291
2.90	0.271
3.10	0.253

APPENDIX E

Liquefaction Analysis Summary – CPT 1

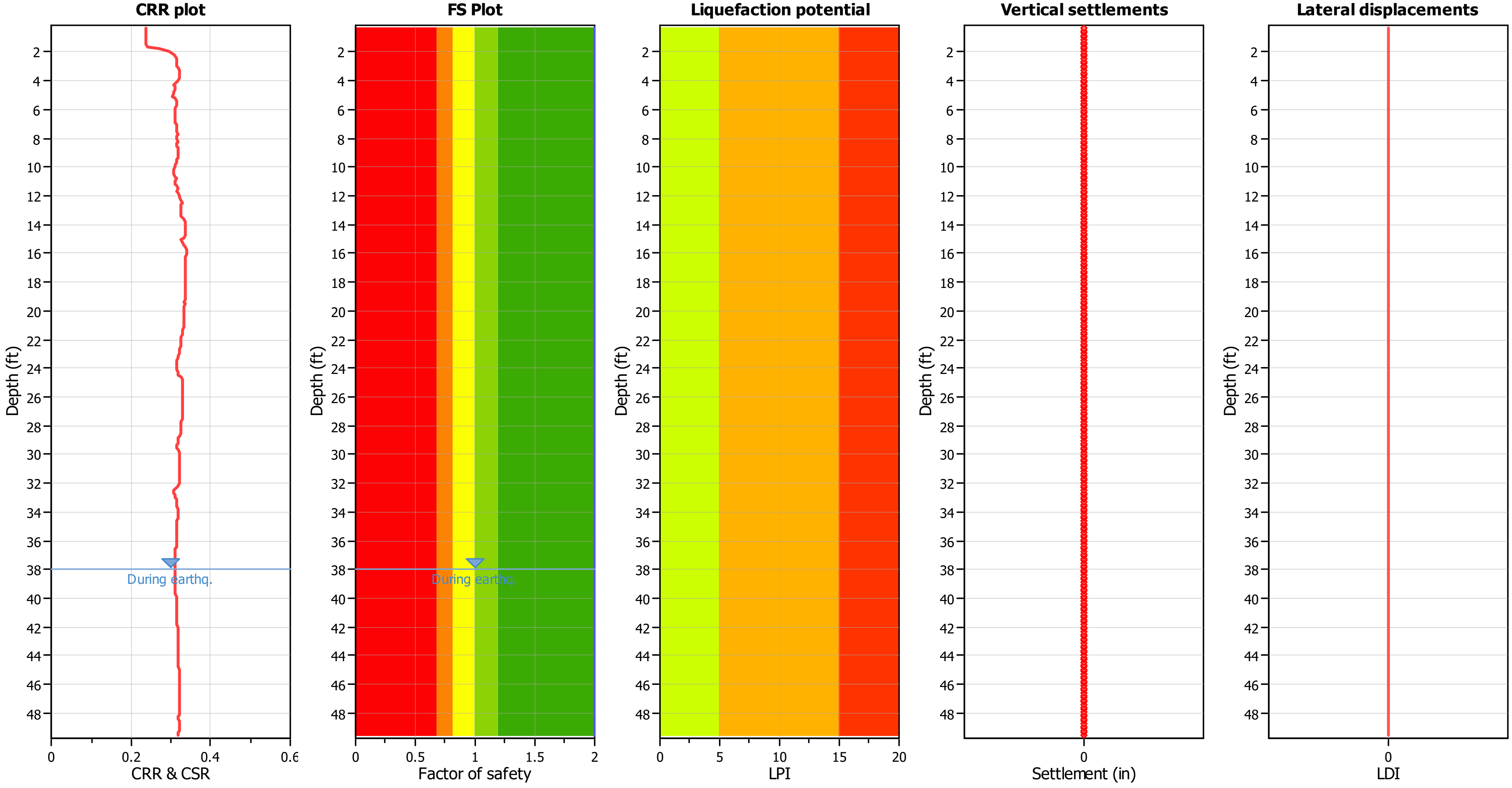
Liquefaction Analysis Summary – CPT 2

Unsaturated Soil Settlement Calculations – Boring 3

Unsaturated Soil Settlement Calculations – Boring 5

Unsaturated Soil Settlement Calculations – Boring 10

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	38.00 ft	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.41	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.60	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	41.00 ft	Fill height:	N/A	Limit depth:	N/A

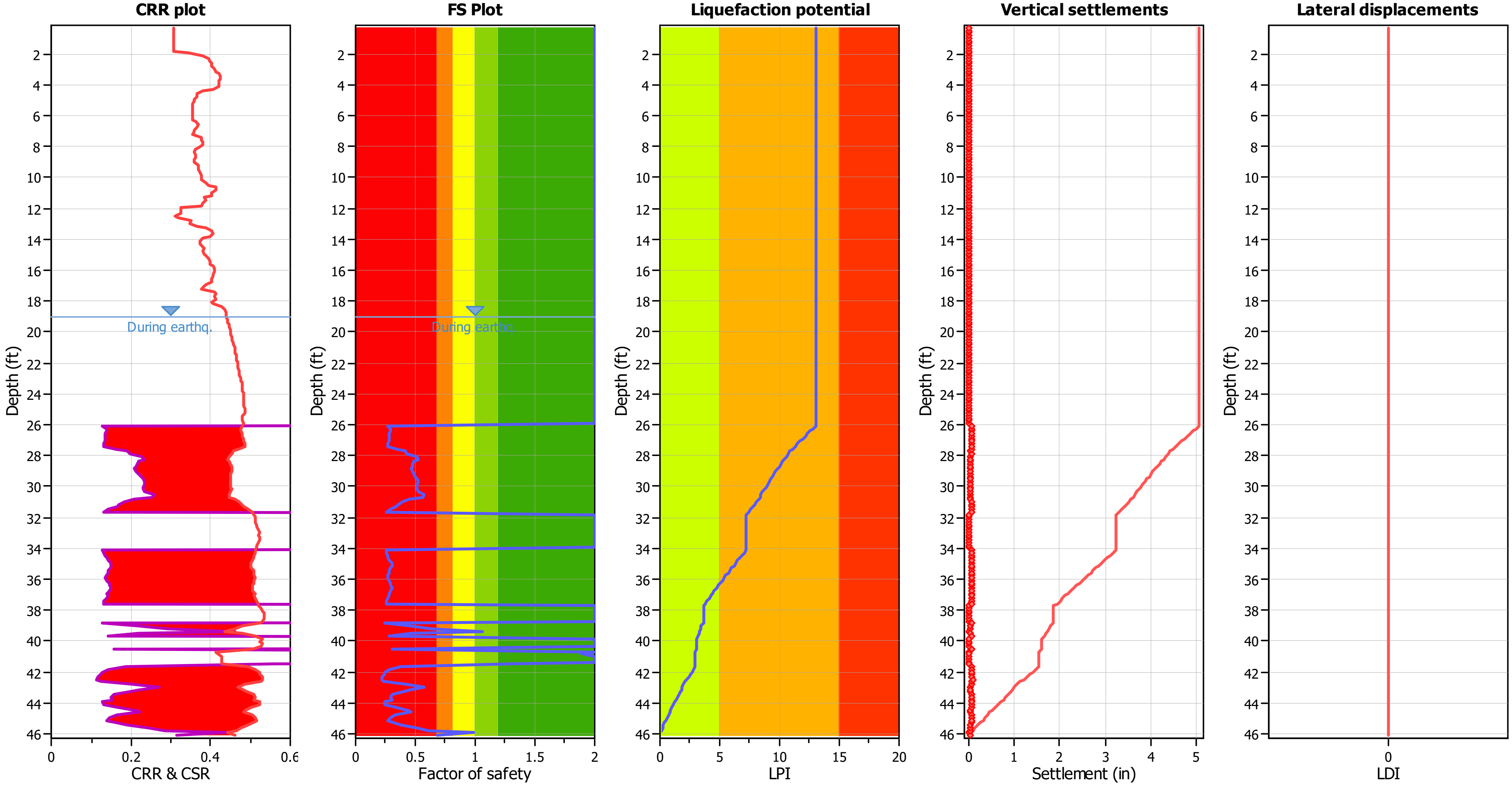
F.S. color scheme

- 🟥 Almost certain it will liquefy
- 🟧 Very likely to liquefy
- 🟨 Liquefaction and no liq. are equally likely
- 🟩 Unlike to liquefy
- 🟩 Almost certain it will not liquefy

LPI color scheme

- 🟥 Very high risk
- 🟧 High risk
- 🟩 Low risk

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	B&I (2014)	Depth to GWT (erthq.):	19.00 ft	Fill weight:	N/A
Fines correction method:	B&I (2014)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	6.41	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.60	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	22.00 ft	Fill height:	N/A	Limit depth:	N/A

F.S. color scheme

- 🟥 Almost certain it will liquefy
- 🟧 Very likely to liquefy
- 🟨 Liquefaction and no liq. are equally likely
- 🟩 Unlike to liquefy
- 🟩 Almost certain it will not liquefy

LPI color scheme

- 🟥 Very high risk
- 🟧 High risk
- 🟩 Low risk

Project: **Greenfield WWTP Upgrades**
Job No: **305748-001**
Date: **3/27/2023**
Boring: **B3** Data Set: 1

Methods: **Liquefaction Analysis using 1996 & 1998 NCEER workshop method (Youd & Idriss, editors)**
Journal of Geotechnical and Enviromental Engineering (JGEE), October 2001, Vol 127, No. 10, ASCE
Settlement Analysis from Tokimatsu and Seed (1987), JGEE,Vol 113, No.8, ASCE
Modified by Pradel, JGEE, Vol 124, No. 4, ASCE

EARTHQUAKE INFORMATION:

Magnitude: **6.41** 7.5
PGA, g: **0.40** 0.27 **2/3 PGAm**
MSF: 1.49
GWT: **43.0** feet
Calc GWT: **40.0** feet
Remediate to: **0.0** **feet**

SPT N VALUE CORRECTIONS:

Energy Correction to N60 (C_E): 1.33 Automatic Hammer
Drive Rod Corr. (C_R): 1 Default
Rod Length above ground (feet): 3.0
Borehole Dia. Corr. (C_B): 1.05
Sampler Liner Correction for SPT?: 1 Yes
Cal Mod/ SPT Ratio: 0.63

Total (in.) Induced Subsidence
0.5
upper 50 ft

Threshold Acceler., g: **#N/A**
Required SF: **1.30**
Minimum Calculated SF: **#N/A**

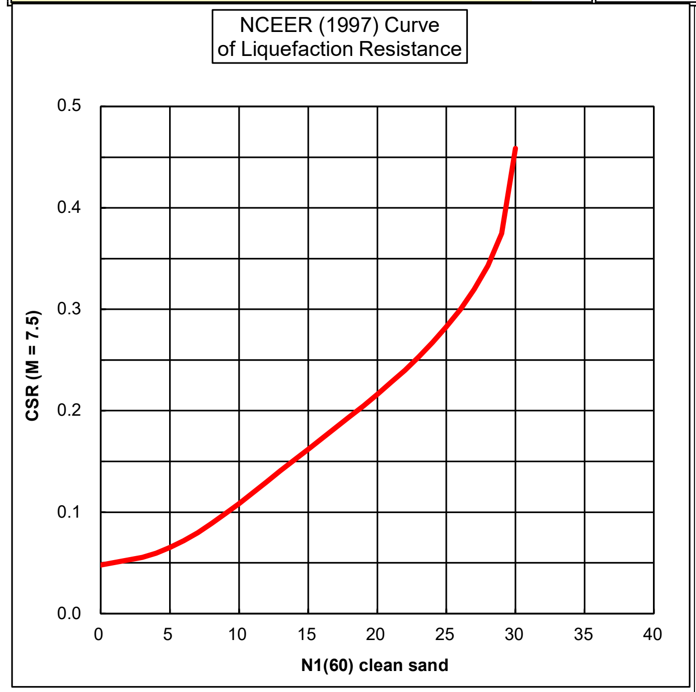
SETTLEMENT (SUBSIDENCE) OF DRY SANDS

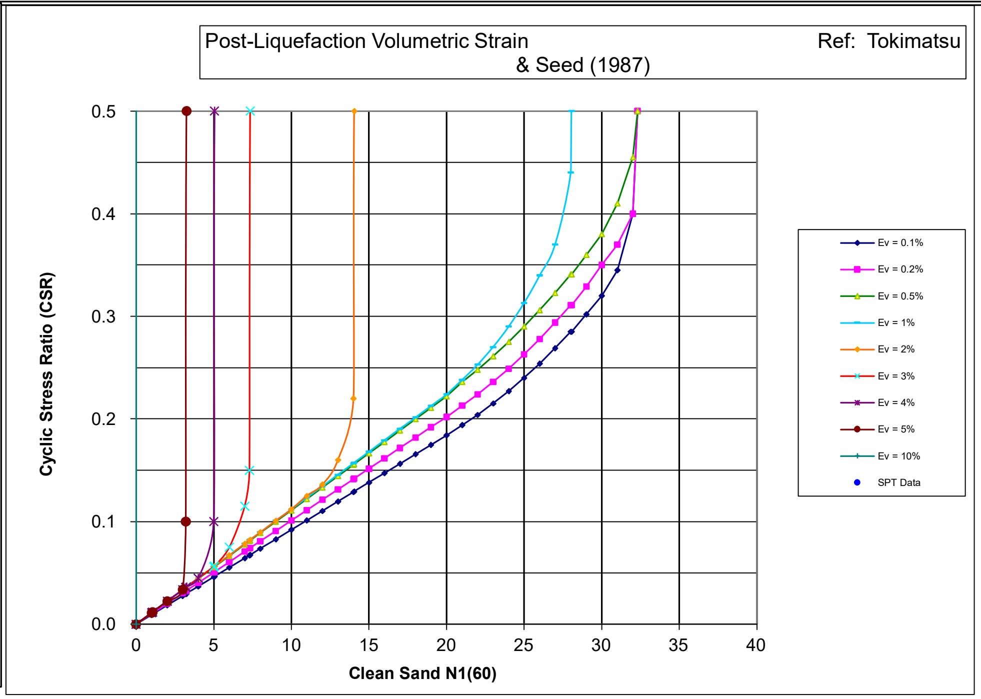
Nc = 6.7

Base Depth (feet)	Cal Mod N	SPT N	Liquef. Suscept. (0 or 1)	Total Unit Wt. (pcf)	Fines Content (%)	Depth of SPT (feet)	Rod Length (feet)
8.0	6	**4**	1	100	10	5.0	8.0
11.5	9	**6**	1	98	2	10.0	13.0
16.5	13	**8**	1	98	2	15.0	18.0

Layer Thick (ft)	Tot.Stress at SPT po (tsf)	Depth m	Eff.Stress at SPT p'o (tsf)	Eff.Stress Design GW p'o (tsf)	rd	C_N	C_R	C_S	$N_{1(60)}$	Rel. Dens. Dr (%)	*Trigger FC Adj.* $\Delta N_{1(60)}$	*Equiv. Sand* $N_{1(60)CS}$	Kσ	M = 7.5 Available CRR	M =7.5 Induced CSR*	**Liquefac. Safety Factor**	*Post FC Adj.* $\Delta N_{1(60)}$	$N_{1(60)CS}$	Volumetric *Strain (%)*	**Induced Subsidence (in.)**
	0.000																			
8.00	0.250	1.52	0.250	0.250	0.99	1.70	0.75	1.00	6.7	31	1.0	7.7	1.00	0.086	0.172	**Non-Liq.**	1.0	7.7	0.32	**0.30**
3.50	0.498	3.05	0.498	0.498	0.98	1.46	0.76	1.00	8.7	35	0.0	8.7	1.00	0.096	0.170	**Non-Liq.**	0.0	8.7	0.29	**0.12**
5.00	0.743	4.57	0.743	0.743	0.97	1.19	0.86	1.00	11.8	41	0.0	11.8	1.00	0.128	0.169	**Non-Liq.**	0.0	11.8	0.17	**0.10**

p (tsf)	G_{max} (tsf)	τ_{av} (tsf)	Shear Strain γ	Strain E_{15}	Strain Enc	**Dry Sand Subsidence (in.)**
0.168	362	0.064	7.3E-04	2.3E-03	1.6E-03	**0.30**
0.334	532	0.127	7.6E-04	2.0E-03	1.4E-03	**0.12**
0.498	718	0.187	6.4E-04	1.2E-03	8.4E-04	**0.10**





$N_{1(60)}$ = C_N*C_E*C_B*C_R*C_S*N
C_R = 0.75 for Rod lengths < 3m, 1.0 for > 10m
= min(1,max(0.75,1.4666-2.556/(z(ft))$^{0.5}$))
C_N = (1 atm/p'o)$^{0.5}$, max 1.7
C_S = max(1.1,min(1.3,1+$N_{1(60)}$/100)) for SPT without liners
MSF = $10^{2.24}/M^{2.56}$
z = Depth (m)
pa = 1 atm = 101 KPa = 1.058 tsf

p = 0.67*po
Nc = $(MAG-4)^{2.17}$
τ_{av} = 0.65*PGA*po*rd
G_{max} = 447*$N_{1(60)CS}{}^{(1/3)}$*$p^{0.5}$
a = 0.0389*(p/1)+0.124
b = 6400*$(p/1)^{(-0.6)}$
γ = [1+a*EXP(b*τ_{av}/G_{max})]/[(1+a)*τ_{av}/G_{max}]
E_{15} = γ*$(N_{1(60)CS}/20)^{-1.2}$
E_{nc} = $(Nc/15)^{0.45}$*E15
S = 2*H*E_{nc}

rd = (1-0.4113*z^0.5+0.04052*z+0.001753*z^1.5)/(1-0.4177*z^0.5+0.05729*z-0.006205*z^1.5+0.00121*z^2))
$\Delta N_{1(60)}$ = min(10,IF(FC<35,exp(1.76-(190/FC^2)),5)+IF(FC<=5,1,IF(FC<35,0.99+(FC^1.5/1000),1.2))*N1(60) - N1(60)
$N_{1(60)CS}$ = $N_{1(60)CS}$ + $\Delta N_{1(60)}$
Kσ = min of 1.0 or (p'o/1.058)$^{(IF(Dr>0.7,0.6,IF(Dr<0.5,0.8,0.7))-1)}$
Dr = $(N_{1(60)}/70)^{0.5}$
CSReq = 0.65*PGA*(po/p'o)*rd
CSR* = CSReq/MSF/Kσ
$CRR_{7.5}$ = (0.048-0.004721*N+0.0006136*N^2-0.00001673*N^3)/(1-0.1248*N+0.009578*N^2-0.0003285*N^3+0.000003714*N^4))
N = $N_{1(60)CS}$

SF = $CRR_{7.5,1atm}$/CSR*

Project: **Greenfield WWTP Upgrades**
Job No: **305748-001**
Date: **3/28/2023**
Boring: **B5** Data Set: 1

Methods: **Liquefaction Analysis using 1996 & 1998 NCEER workshop method (Youd & Idriss, editors)**
Journal of Geotechnical and Enviromental Engineering (JGEE), October 2001, Vol 127, No. 10, ASCE
Settlement Analysis from Tokimatsu and Seed (1987), JGEE,Vol 113, No.8, ASCE
Modified by Pradel, JGEE, Vol 124, No. 4, ASCE

EARTHQUAKE INFORMATION:

Magnitude: **6.41** 7.5
PGA, g: **0.40** 0.27 **2/3 PGAm**
MSF: 1.49
GWT: **43.0** feet
Calc GWT: **40.0** feet
Remediate to: **0.0** **feet**

SPT N VALUE CORRECTIONS:

Energy Correction to N60 (C_E): 1.33 Automatic Hammer
Drive Rod Corr. (C_R): 1 Default
Rod Length above ground (feet): 3.0
Borehole Dia. Corr. (C_B): 1.05
Sampler Liner Correction for SPT?: 1 Yes
Cal Mod/ SPT Ratio: 0.63

Threshold Acceler., g: **#N/A**

Required SF: **1.30**
Minimum Calculated SF: **#N/A**

Total (in.) Induced Subsidence
0.7

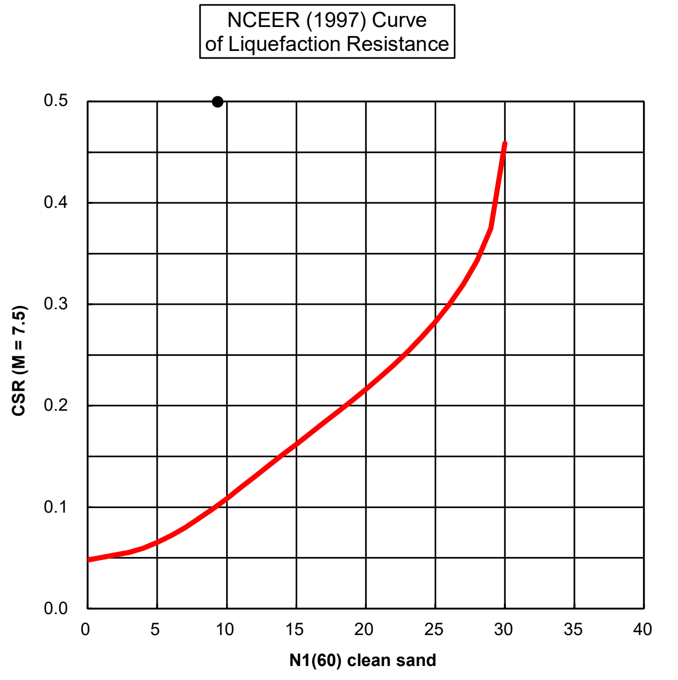
upper 50 ft

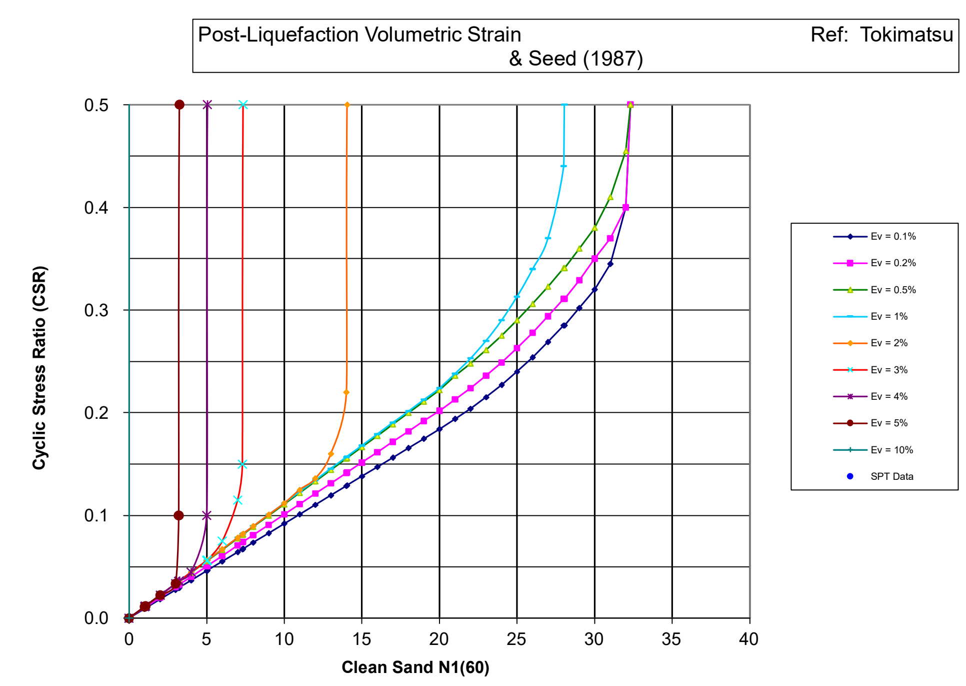
SETTLEMENT (SUBSIDENCE) OF DRY SANDS

Nc = 6.7

Base Depth (feet)	Cal Mod N	SPT N	Liquef. Suscept. (0 or 1)	Total Unit Wt. (pcf)	Fines Content (%)	Depth of SPT (feet)	Rod Length (feet)	Layer Thick (ft)	Tot.Stress at SPT po (tsf)	Depth m	Eff.Stress at SPT p'o (tsf)	Eff.Stress Design GW p'o (tsf)	rd	C_N	C_R	C_S	$N_{1(60)}$
									0.000								
8.0	5	**3**	1	97	16	5.0	8.0	8.00	0.243	1.52	0.243	0.243	0.99	1.70	0.75	1.00	5.6
12.0	11	**7**	1	97	16	10.0	13.0	4.00	0.485	3.05	0.485	0.485	0.98	1.48	0.76	1.00	10.8
18.5	15	**9**	1	110	16	15.0	18.0	6.50	0.747	4.57	0.747	0.747	0.97	1.19	0.86	1.00	13.6
22.5	17	**11**	1	117	16	20.0	23.0	4.00	1.027	6.10	1.027	1.027	0.96	1.01	0.93	1.00	14.2
24.5	8	**5**		110	74	23.0	26.0	2.00	1.201	7.01	1.201	1.201	0.95	1.00	0.97	1.00	6.8
28.0	7	**4**	1	117	16	27.0	30.0	3.50	1.430	8.23	1.430	1.430	0.93	0.86	1.00	1.00	5.3
32.5	13	**8**	1	97	4	30.0	33.0	4.50	1.585	9.14	1.585	1.585	0.92	0.82	1.00	1.00	9.3
40.0	7	**4**		110	74	40.0	43.0	7.50	2.119	12.19	2.119	2.119	0.85	1.00	1.00	1.00	6.2

Base Depth (feet)	Rel. Dens. Dr (%)	*Trigger FC Adj.* $\Delta N_{1(60)}$	*Equiv. Sand* $N_{1(60)CS}$	Kσ	M = 7.5 Available CRR	M =7.5 Induced CSR*	**Liquefac. Safety Factor**	*Post FC Adj.* $\Delta N_{1(60)}$	$N_{1(60)CS}$	Volumetric *Strain (%)*	**Induced Subsidence (in.)**	p (tsf)	G_{max} (tsf)	τ_{av} (tsf)	Shear Strain γ	Strain E_{15}	Strain Enc	**Dry Sand Subsidence (in.)**
8.0	28	3.1	8.7	1.00	0.095	0.172	**Non-Liq.**	3.1	8.7	0.24	**0.23**	0.162	370	0.062	6.3E-04	1.7E-03	1.2E-03	**0.23**
12.0	39	3.4	14.2	1.00	0.153	0.170	**Non-Liq.**	3.4	14.2	0.10	**0.05**	0.325	617	0.123	4.7E-04	7.2E-04	5.0E-04	**0.05**
18.5	44	3.5	17.1	1.00	0.184	0.169	**Non-Liq.**	3.5	17.1	0.08	**0.06**	0.500	814	0.188	4.7E-04	5.7E-04	4.0E-04	**0.06**
22.5	45	3.5	17.7	1.01	0.191	0.166	**Non-Liq.**	3.5	17.7	0.08	**0.04**	0.688	966	0.256	5.2E-04	6.0E-04	4.2E-04	**0.04**
24.5				0.97	Infin.	0.169	**Non-Liq.**		6.8	0.00	**0.00**	0.805						
28.0	28	3.1	8.4	0.94	0.092	0.173	**Non-Liq.**	3.1	8.4	0.42	**0.18**	0.958	888	0.347	1.0E-03	3.0E-03	2.1E-03	**0.18**
32.5	37	0.0	9.3	0.92	Infin.	0.174	**Non-Liq.**	0.0	9.3	0.33	**0.18**	1.062	970	0.379	9.6E-04	2.4E-03	1.7E-03	**0.18**
40.0				0.87	Infin.	0.170	**Non-Liq.**		6.2	0.00	**0.00**	1.420						





$N_{1(60)}$ = C_N*C_E*C_B*C_R*C_S*N

C_R = 0.75 for Rod lengths < 3m, 1.0 for > 10m
= min(1,max(0.75,1.4666-2.556/(z(ft))$^{0.5}$))

C_N = (1 atm/p'o)$^{0.5}$, max 1.7

C_S = max(1.1,min(1.3,1+$N_{1(60)}$/100)) for SPT without liners

MSF = $10^{2.24}/M^{2.56}$

z = Depth (m)

pa = 1 atm = 101 KPa = 1.058 tsf

p = 0.67*po

Nc = (MAG-4)$^{2.17}$

τ_{av} = 0.65*PGA*po*rd

G_{max} = 447*$N_{1(60)CS}{}^{(1/3)}$*$p^{0.5}$

a = 0.0389*(p/1)+0.124

b = 6400*(p/1)$^{(-0.6)}$

γ = [1+a*EXP(b*τ_{av}/G_{max})]/[(1+a)*τ_{av}/G_{max}]

E_{15} = γ*($N_{1(60)CS}$/20)$^{-1.2}$

E_{nc} = (Nc/15)$^{0.45}$*E15

S = 2*H*E_{nc}

rd = (1-0.4113*z^0.5+0.04052*z+0.001753*z^1.5)/(1-0.4177*z^0.5+0.05729*z-0.006205*z^1.5+0.00121*z^2))

$\Delta N_{1(60)}$ = min(10,IF(FC<35,exp(1.76-(190/FC^2)),5)+IF(FC<=5,1,IF(FC<35,0.99+(FC^1.5/1000),1.2))*N1(60) - N1(60)

$N_{1(60)CS}$ = $N_{1(60)CS}$ + $\Delta N_{1(60)}$

Kσ = min of 1.0 or (p'o/1.058)$^{(IF(Dr>0.7,0.6,IF(Dr<0.5,0.8,0.7))-1)}$

Dr = ($N_{1(60)}$/70)$^{0.5}$

CSReq = 0.65*PGA*(po/p'o)*rd
CSR* = CSReq/MSF/Kσ

$CRR_{7.5}$ = (0.048-0.004721*N+0.0006136*N^2-0.00001673*N^3)/(1-0.1248*N+0.009578*N^2-0.0003285*N^3+0.000003714*N^4))

N = $N_{1(60)CS}$

SF = $CRR_{7.5,1atm}$/CSR*

Project: Greenfield WWTP Upgrades
Job No: 305748-001
Date: 3/28/2023
Boring: B10 Data Set: 1

Methods: **Liquefaction Analysis using 1996 & 1998 NCEER workshop method (Youd & Idriss, editors)**
Journal of Geotechnical and Enviromental Engineering (JGEE), October 2001, Vol 127, No. 10, ASCE
Settlement Analysis from Tokimatsu and Seed (1987), JGEE,Vol 113, No.8, ASCE
Modified by Pradel, JGEE, Vol 124, No. 4, ASCE

EARTHQUAKE INFORMATION:

Magnitude: 6.41 7.5
PGA, g: 0.40 0.27 **2/3 PGAm**
MSF: 1.49
GWT: 22.0 feet
Calc GWT: 19.0 feet
Remediate to: 0.0 **feet**

SPT N VALUE CORRECTIONS:

Energy Correction to N60 (C_E): 1.00
Drive Rod Corr. (C_R): 1 Default
Rod Length above ground (feet): 3.0
Borehole Dia. Corr. (C_B): 1.05
Sampler Liner Correction for SPT?: 1 Yes
Cal Mod/ SPT Ratio: 0.63

Threshold Acceler., g: #N/A
Required SF: 1.30
Minimum Calculated SF: #N/A

Total (in.) Induced Subsidence
0.2
upper 50 ft

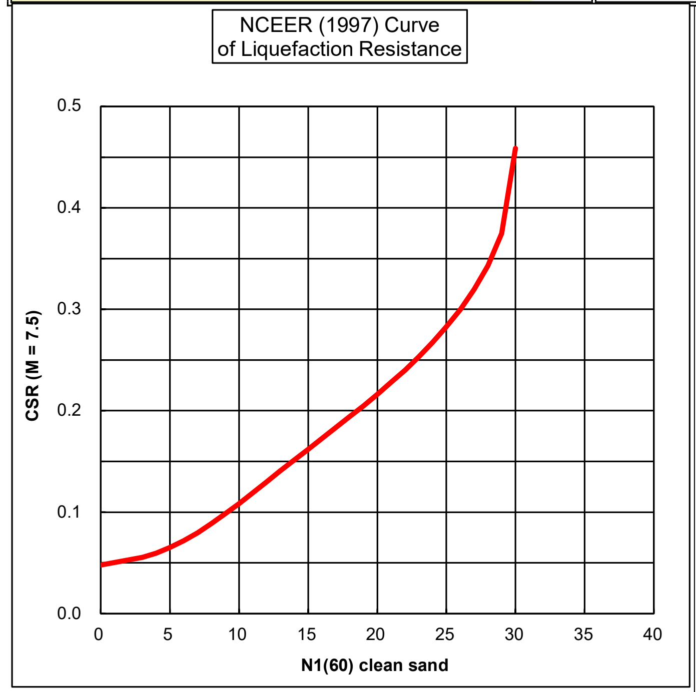
SETTLEMENT (SUBSIDENCE) OF DRY SANDS

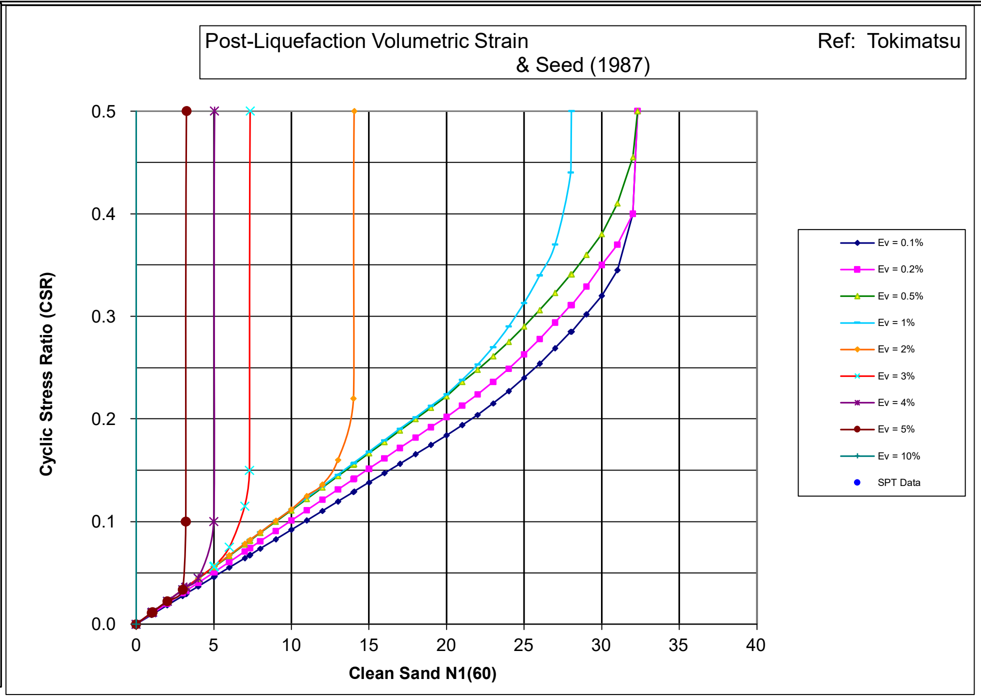
Nc = 6.7

Base Depth (feet)	Cal Mod N	SPT N	Liquef. Suscept. (0 or 1)	Total Unit Wt. (pcf)	Fines Content (%)	Depth of SPT (feet)	Rod Length (feet)
8.0	13	**8**	1	91	4	5.0	8.0
12.5	17	**11**	1	107	4	10.0	13.0
20.0		**6**	1	107	66	15.0	18.0

Layer Thick (ft)	Tot.Stress at SPT po (tsf)	Depth m	Eff.Stress at SPT p'o (tsf)	Eff.Stress Design GW p'o (tsf)	rd	C_N	C_R	C_S	$N_{1(60)}$	Rel. Dens. Dr (%)	*Trigger FC Adj.* $\Delta N_{1(60)}$	*Equiv. Sand* $N_{1(60)CS}$	Kσ	M = 7.5 Available CRR	M =7.5 Induced CSR*	**Liquefac. Safety Factor**	*Post FC Adj.* $\Delta N_{1(60)}$	$N_{1(60)CS}$	Volumetric *Strain (%)*	**Induced Subsidence (in.)**
	0.000																			
8.00	0.227	1.52	0.227	0.227	0.99	1.70	0.75	1.00	11.0	40	0.0	11.0	1.00	0.119	0.172	**Non-Liq.**	0.0	11.0	0.14	**0.13**
4.50	0.471	3.05	0.471	0.471	0.98	1.50	0.76	1.00	12.8	43	0.0	12.8	1.00	0.138	0.170	**Non-Liq.**	0.0	12.8	0.12	**0.07**
7.50	0.738	4.57	0.738	0.738	0.97	1.20	0.86	1.10	7.2	32	6.4	13.6	1.00	0.147	0.169	**Non-Liq.**	6.4	13.6	0.00	**0.00**

p (tsf)	G_{max} (tsf)	τ_{av} (tsf)	Shear Strain γ	Strain E_{15}	Strain Enc	**Dry Sand Subsidence (in.)**
0.152	387	0.058	4.8E-04	9.8E-04	6.9E-04	**0.13**
0.315	587	0.120	5.1E-04	8.8E-04	6.1E-04	**0.07**
0.495	750	0.186	5.7E-04			


NCEER (1997) Curve
of Liquefaction Resistance


Post-Liquefaction Volumetric Strain
Ref: Tokimatsu & Seed (1987)

$N_{1(60)}$ = C_N*C_E*C_B*C_R*C_S*N
C_R = 0.75 for Rod lengths < 3m, 1.0 for > 10m
= min(1,max(0.75,1.4666-2.556/(z(ft))$^{0.5}$))
C_N = (1 atm/p'o)$^{0.5}$, max 1.7
C_S = max(1.1,min(1.3,1+$N_{1(60)}$/100)) for SPT without liners
MSF = $10^{2.24}$/$M^{2.56}$
z = Depth (m)
pa = 1 atm = 101 KPa = 1.058 tsf

p = 0.67*po
τ_{av} = 0.65*PGA*po*rd
G_{max} = 447*$N_{1(60)CS}{}^{(1/3)}$*$p^{0.5}$
a = 0.0389*(p/1)+0.124
b = 6400*(p/1)$^{(-0.6)}$
γ = [1+a*EXP(b*τ_{av}/G_{max})]/[(1+a)*τ_{av}/G_{max}]
E_{15} = γ*($N_{1(60)CS}$/20)$^{-1.2}$
E_{nc} = (Nc/15)$^{0.45}$*E15

Nc = (MAG-4)$^{2.17}$
S = 2*H*E_{nc}

rd = (1-0.4113*z^0.5+0.04052*z+0.001753*z^1.5)/(1-0.4177*z^0.5+0.05729*z-0.006205*z^1.5+0.00121*z^2))
$\Delta N_{1(60)}$ = min(10,IF(FC<35,exp(1.76-(190/FC^2)),5)+IF(FC<=5,1,IF(FC<35,0.99+(FC^1.5/1000),1.2))*N1(60) - N1(60)
$N_{1(60)CS}$ = $N_{1(60)CS}$ + $\Delta N_{1(60)}$
Kσ = min of 1.0 or (p'o/1.058)$^{(IF(Dr>0.7,0.6,IF(Dr<0.5,0.8,0.7))-1)}$
Dr = ($N_{1(60)}$/70)$^{0.5}$
CSReq = 0.65*PGA*(po/p'o)*rd
CSR* = CSReq/MSF/Kσ
$CRR_{7.5}$ = (0.048-0.004721*N+0.0006136*N^2-0.00001673*N^3)/(1-0.1248*N+0.009578*N^2-0.0003285*N^3+0.000003714*N^4))
N = $N_{1(60)CS}$

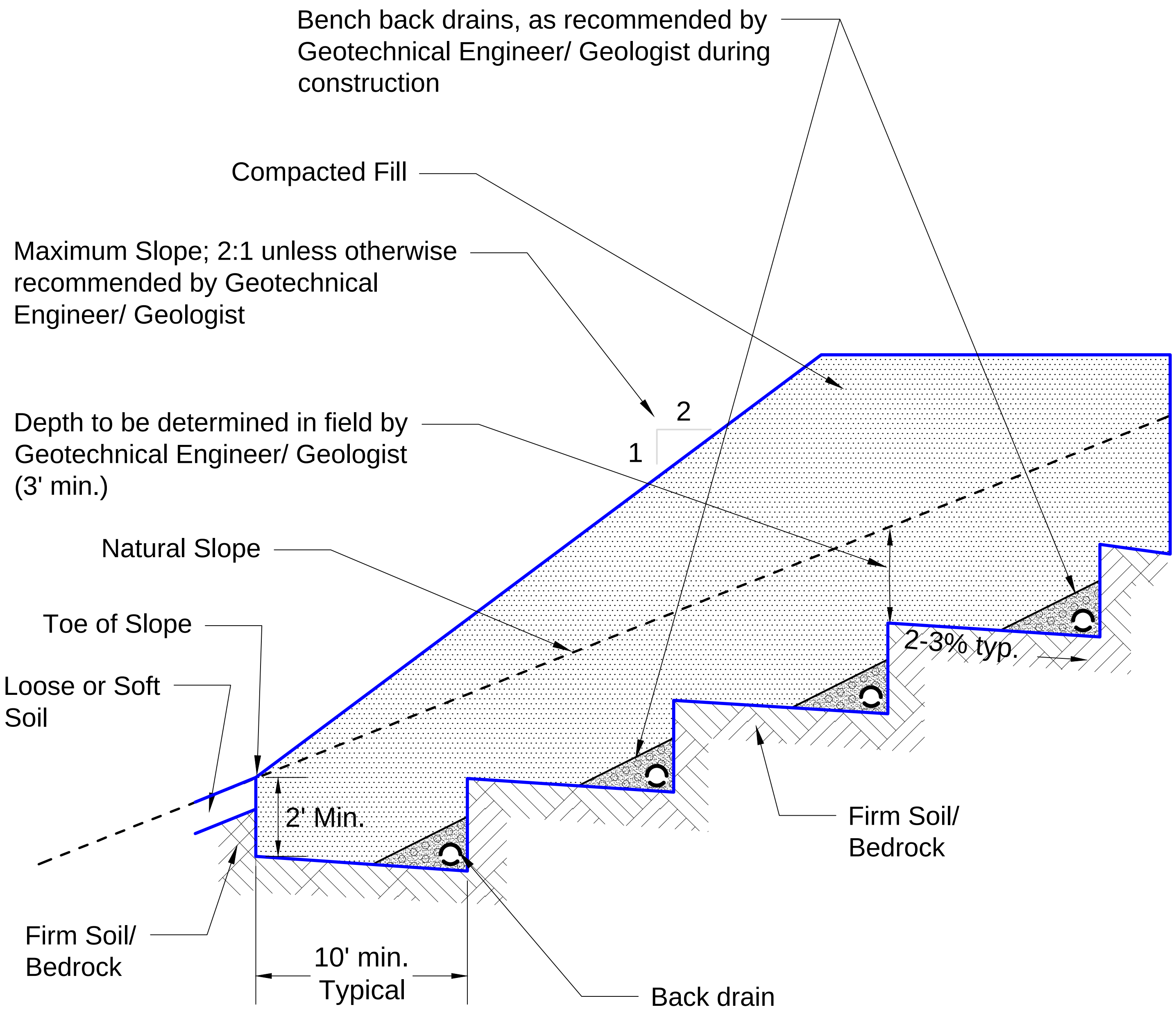
SF = $CRR_{7.5,1atm}$/CSR*

APPENDIX F

Typical Bench and Keyway Detail

Typical Back Drain Detail

Typical Detail A: Pipe Placed Parallel to Foundations



SCHEMATIC ONLY

NOT TO SCALE

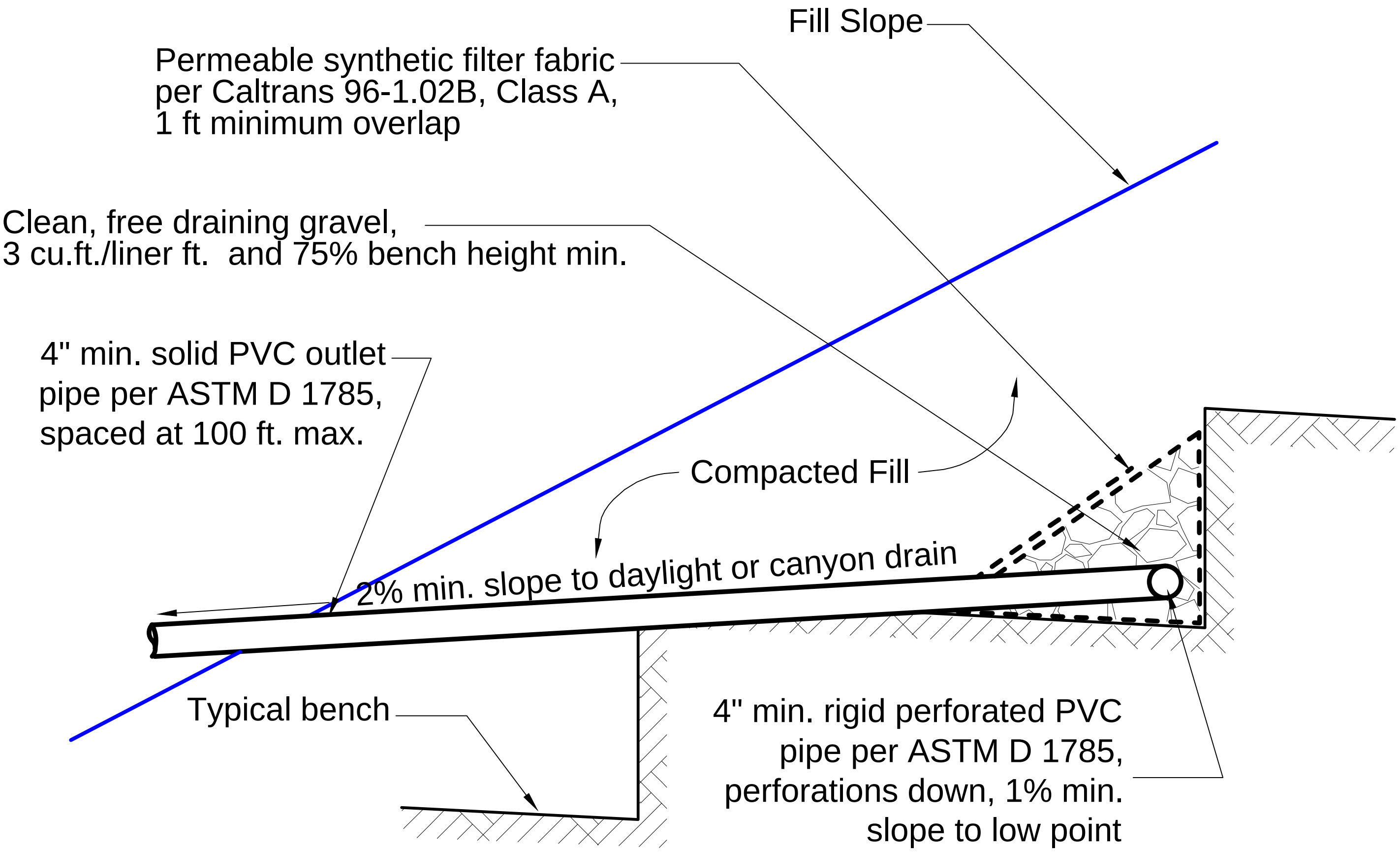
Earth Systems Pacific
4378 Old Santa Fe Road, San Luis Obispo, CA 93401
www.earthsystems.com
(805) 544-3276 ● Fax (805) 544-1786

TYPICAL BENCH AND KEYWAY DETAIL
Greenfield Wastewater Treatment Plant Upgrades
41901 Walnut Avenue
Greenfield, California

Date
March 2023

Project No.
305748-001

TYPICAL BENCH AND KEYWAY DETAIL



Note: A prefabricated geocomposite drainage system (Advanedge, Miradrain, etc.) may be substituted for the gravel / pipe system, provided it is installed in accordance with the manufacturer's recommendations

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Earth Systems Pacific
4378 Old Santa Fe Road, San Luis Obispo, CA 93401
www.earthsystems.com
(805) 544-3276 • Fax (805) 544-1786

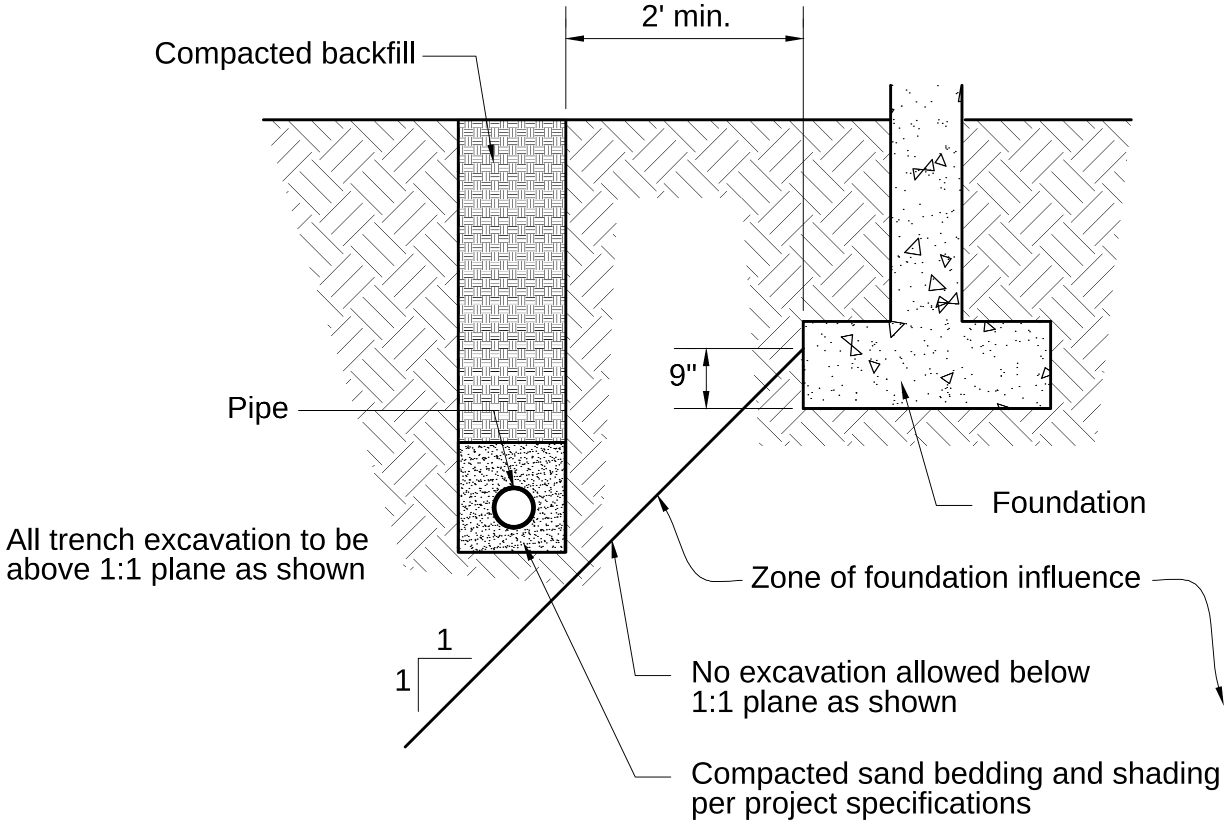
TYPICAL BACK DRAIN DETAIL
Greenfield Wastewater Treatment Plant Upgrades
41901 Walnut Avenue
Greenfield, California

Date
March 2023

Project No.
305748-001

DRAIN–D01–V06111116

TYPICAL DETAIL A
PIPE PLACED PARALLEL TO FOUNDATION



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Appendix D
Percolation Report

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Pacific Crest
ENGINEERING INC

GEOTECHNICAL | ENVIRONMENTAL | CHEMICAL | MATERIAL TESTING | SPECIAL INSPECTIONS

August 28, 2023 Project No. 22141-M381A-B43

Oliviya Wyse
Associate Planner
Denise Duffy & Associates, Inc.
947 Cass Street, Suite 5
Monterey, CA 93940

Subject: Limited Geotechnical investigation
Infiltration Testing
Proposed Effluent Spray Field
APN 109-031-014
Greenfield, California

Dear Oliviya,

In accordance with your authorization, we have conducted infiltration testing and evaluated the feasibility for shallow retention facilities within the northwestern portion of the subject parcel. Based on the findings of our infiltration study, it is our opinion that relatively shallow (less than 5 feet below original grade) retention facilities are feasible within the subject area provided they are designed in accordance with the recommendations and design values provided in this document.

INFILTRATION TESTING PROCEDURE

Three (3) infiltration test borings were advanced within the northwestern portion of the subject property at locations identified by the City of Greenfield. The locations of the infiltration test borings are depicted on the site map included as Figure No. 2 of this document. The infiltration test borings were advanced to depths of approximately 4 feet below existing grades.

All infiltration test holes were drilled using a tractor mounted drill rig equipped with 12-inch diameter solid flight augers. An engineer from Pacific Crest Engineering Inc. was present during the drilling operations to log the soil encountered and to verify the infiltration test depths. Approximately 1 to 2 inches of clean crushed ½-inch diameter gravel was placed at the bottom of each boring. A 4-inch diameter perforated pipe was then placed within each test hole, and the annular space backfilled with gravel. The test holes were presoaked for approximately 24 hours prior to infiltration testing.

The infiltration tests were performed in accordance with the Central Coast Low Impact Development Initiative, with procedures outlined in the report titled "*Native Soil Assessment For Small Infiltration-Based Storm Water Control Measures*". Our infiltration study followed the "Shallow Quick Infiltration Test" method, as described within Attachment 1 of the subject document. This procedure is generally described as follows:

1. At the commencement of each test, the water level within the infiltration test boring was adjusted to the top of the test zone (approximately 2 feet above the bottom of the boring). This was accomplished with a garden hose connected to a flow meter, allowing the volume of water placed within the test boring to be recorded.

2. The water level within each test boring was maintained at a constant head for the initial 30 minutes of the test. The volume of water required to maintain the constant head was recorded.

3. Following the initial 30-minute constant head period, the water elevation was allowed to fall. This portion of the test was continued for a minimum of 2 hours, with water elevation readings being taken every 10 minutes. The difference in water elevation was then used to compute the infiltration rate at each time interval.

4. If the test boring were to run out of water during the 2-hour test, it would be refilled to the initial elevation. If the infiltration rate was such that the test boring was to run dry following 2 refills (not including the initial fill-up), then the test was concluded.

5. If the drop-in elevation was less than 6 inches in 2 hours, or if the readings were not stable at the end of the 2-hour test, then the test was continued for an additional 2-hour interval (4 hours total).

6. The final infiltration rate is defined as the infiltration rate during the last time interval. The last time interval is considered to be the last refill cycle or the last 2 hours of a 4-hour test. All final infiltration rates (I_t) were calculated in accordance with the Porchet Method that accounts for sidewall infiltration, with units of (in^3/in^2)/hr. or in/hr. The factored infiltration rate (k_f), which includes a factor of safety of 2, was also calculated from the final interval.

INFILTRATION TEST RESULTS

A summary of the infiltration test results is provided below. The complete infiltration test sheets are provided as Figures 8 through 10 of this document.

Table No. 1 – Summary of Infiltration Test Results

Test No.	Test Depth (ft)	Soil Type within Test Zone	Soil Gradation			Infiltration Rate, I_t (in/hr.)	Factored Infiltration Rate, K_f (in/hr.)
			Gravel (%)	Sand (%)	Fines (%)		
P-1B	2.0 to 4.0	Silty Sand	0.0	68.8	31.2	5.6	2.8
P-2B	1.9 to 3.9	Silty Sand	0.9	82.9	16.2	6.3	3.1
P-3B	2.2 to 4.2	Sand	0.0	96.0	4.0	5.4	2.7

These tests were conducted in the summer. As a result, the current saturation levels of the in-situ soils may be lower than wintertime conditions. Generally, infiltration rates tend to decrease as the relative saturation of the soil increases. Therefore, the infiltration rates as achieved during this site-specific investigation may decrease during a normal or above normal rainfall event. As a result, we recommend that the civil engineer apply a safety factor to the design values as a way to account for seasonal variations.

CONCLUSIONS & RECOMMENDATIONS

1. Based on the findings of our infiltration study, it is our opinion that relatively shallow (less than 5 feet below original grade) retention facilities are feasible within the subject area provided they are designed in accordance with the recommendations and design values provided in this document.

2. At the time we prepared this report, the project plans had not been completed and the retention locations and system details had not been finalized. We request an opportunity to review these plans during the design stages to determine if supplemental recommendations will be required.

3. The retention systems should be designed with the factored infiltration rates summarized in Table 1 above, with applicable safety factors as determined by the project civil engineer.

4. Infiltration rates tend to decrease as the percentage of fine-grained soil increases. Additionally, the grain size distribution of the local soil deposits can vary from location to location. A representative of Pacific Crest Engineering, Inc. should be present during the grading process to verify that the encountered soils are consistent with the conditions discussed in this report.

5. Maintenance of the retention facilities will be critical in order to maintain the design infiltration rates. The retention facilities must be inspected and maintained on a routine basis. Repairs and upgrades, whenever necessary, must be made in a timely manner. The civil and geotechnical engineers should be consulted if significant drainage problems occur so that the conditions can be observed, and supplemental recommendations can be provided, as necessary.

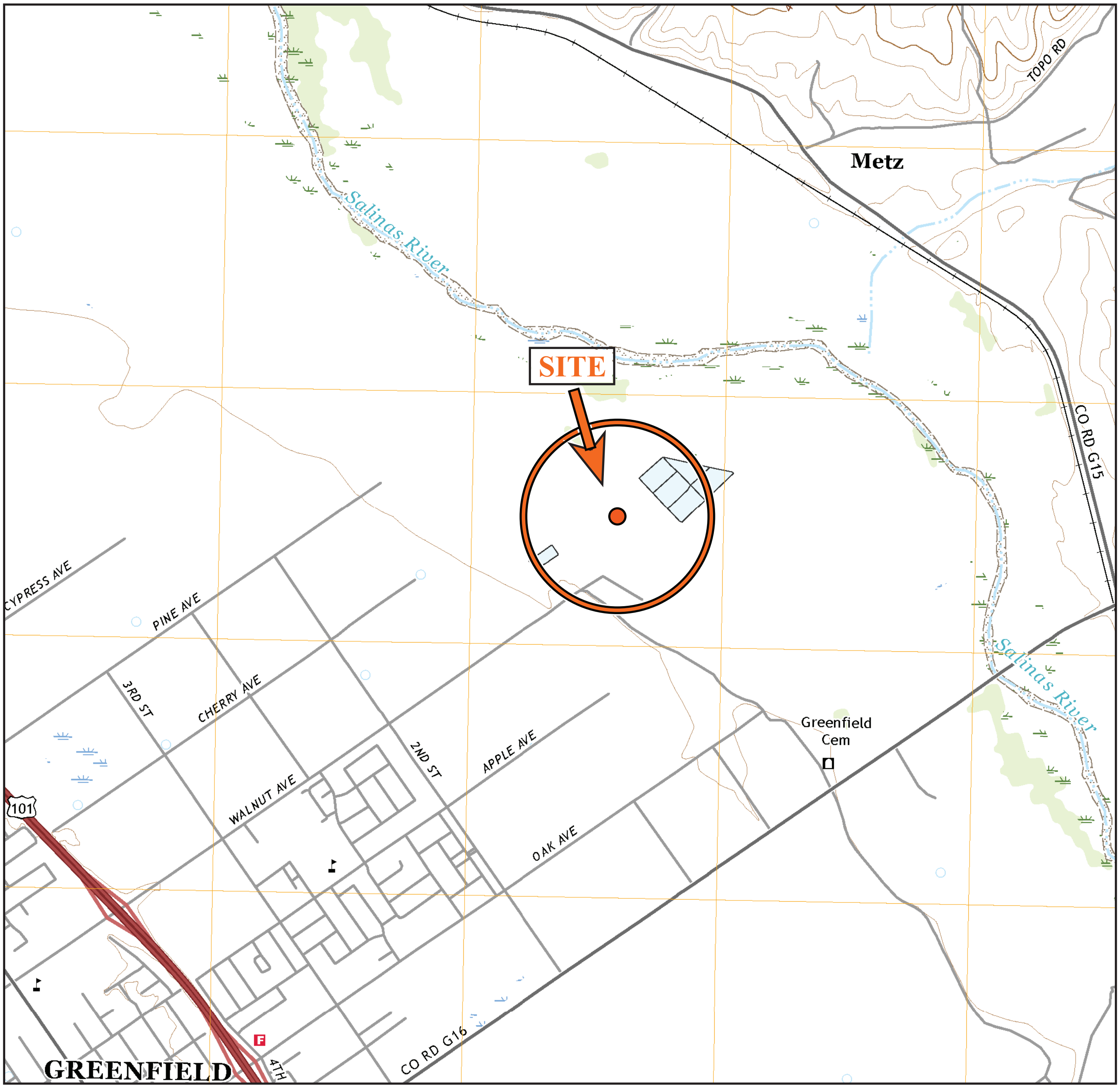
We appreciate the opportunity to be of service. If you have any questions concerning the information presented in this report, please contact our office.

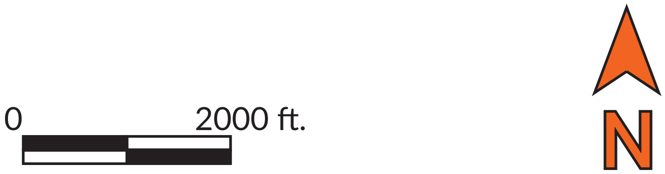
Sincerely,

PACIFIC CREST ENGINEERING INC.

REGISTERED PROFESSIONAL ENGINEER
MATTHEW JOSEPH MACIEL
GE3189
Exp. 9/30/24
GEOTECHNICAL
STATE OF CALIFORNIA

Matt Maciel, GE
Principal Geotechnical Engineer
GE 3189, Expires 9/30/24



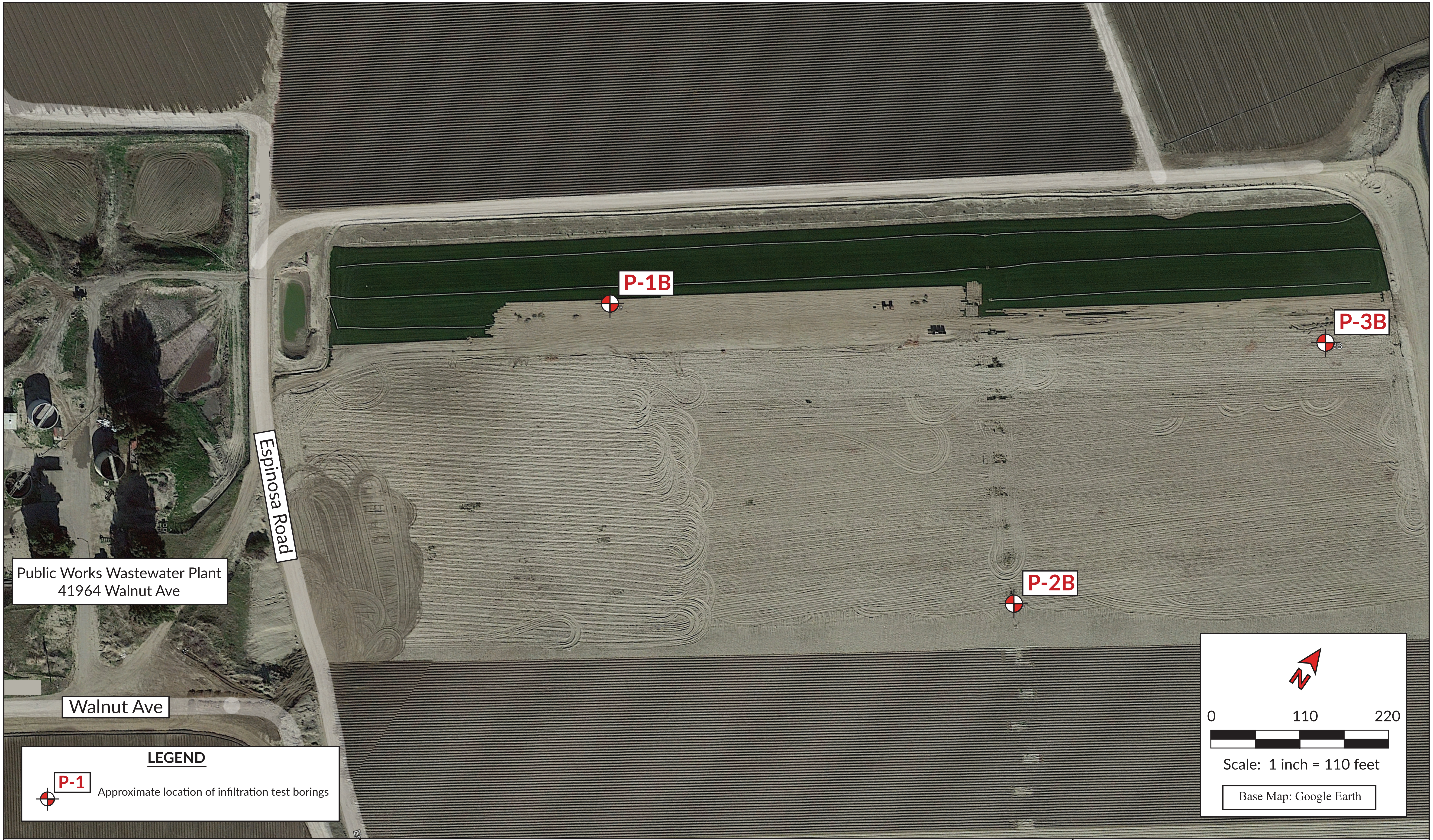


Base Map: © OpenStreetMap contributors

Pacific Crest
ENGINEERING INC

Regional Site Map
Greenfield Effluent Spray Fields
Greenfield, California

Figure No. 1
Project No. 22141
Date: 8/28/23



Pacific Crest
ENGINEERING INC

Site Map Showing Test Borings
Greenfield Effluent Spray Fields
Greenfield, California

Figure No. 2
Project No. 22141
Date: 8/28/23

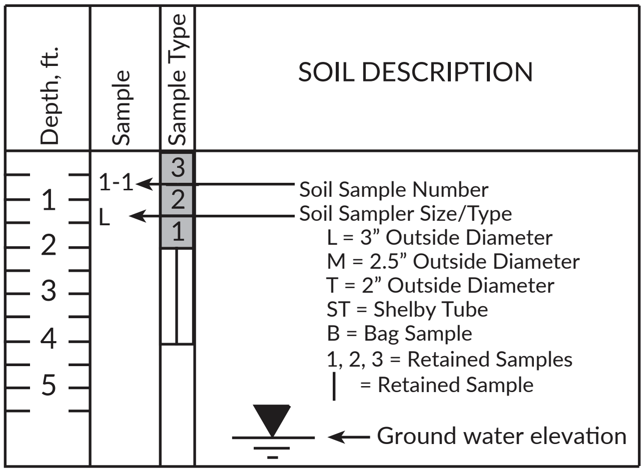
KEY TO SOIL CLASSIFICATION - FINE GRAINED SOILS (FGS)
UNIFIED SOIL CLASSIFICATION SYSTEM - ASTM D2487 (Modified)

MAJOR DIVISIONS		SYMBOL	FINES	COARSENESS	SAND/GRAVEL	GROUP NAME
SILT AND CLAY	*LL < 35% Low Plasticity	**CL** Lean Clay PI > 7 Plots Above A Line -OR- **ML** Silt PI > 4 Plots Below A Line	<30% plus No. 200	<15% plus No. 200		Lean Clay / Silt
				15-30% plus No. 200	% sand ≥ % gravel	Lean Clay with Sand / Silt with Sand
					% sand < % gravel	Lean Clay with Gravel / Silt with Gravel
			≥30% plus No. 200	% sand ≥ % gravel	< 15% gravel	Sandy Lean Clay / Sandy Silt
					≥ 15% gravel	Sandy Lean Clay with Gravel / Sandy Silt with Gravel
				% sand < % gravel	< 15% sand	Gravelly Lean Clay / Gravelly Silt
					≥ 15% sand	Gravelly Lean Clay with Sand / Gravelly Silt with Sand
		CL - ML 4 < PI < 7	<30% plus No. 200	<15% plus No. 200		Silty Clay
				15-30% plus No. 200	% sand ≥ % gravel	Silty Clay with Sand
					% sand < % gravel	Silty Clay with Gravel
			≥30% plus No. 200	% sand ≥ % gravel	< 15% gravel	Sandy Silty Clay
					≥15% gravel	Sandy Silty Clay with Gravel
				% sand < % gravel	< 15% sand	Gravelly Silty Clay
					≥15% sand	Gravelly Silty Clay with Sand
	35% ≤ *LL < 50% Intermediate Plasticity	**CI**	<30% plus No. 200	<15% plus No. 200		Clay
				15-30% plus No. 200	% sand ≥ % gravel	Clay with Sand
					% sand < % gravel	Clay with Gravel
			≥30% plus No. 200	% sand ≥ % gravel	< 15% gravel	Sandy Clay
					≥ 15% gravel	Sandy Clay with Gravel
				% sand < % gravel	< 15% sand	Gravelly Clay
					≥ 15% sand	Gravelly Clay with Sand
	*LL > 50% High Plasticity	**CH** Fat Clay Plots Above A Line -OR- **MH** Elastic Silt Plots Below A Line	<30% plus No. 200	<15% plus No. 200		Fat Clay or Elastic Silt
				15-30% plus No. 200	% sand ≥ % gravel	Fat Clay with Sand Elastic Silt with Sand
					% sand < % gravel	Fat Clay with Gravel / Elastic Silt with Gravel
			≥30% plus No. 200	% sand ≥ % gravel	< 15% gravel	Sandy Fat Clay / Sandy Elastic Silt
					≥ 15% gravel	Sandy Fat Clay with Gravel / Sandy Elastic Silt with Gravel
				% sand < % gravel	< 15% sand	Gravelly Fat Clay / Gravelly Elastic Silt
					≥ 15% sand	Gravelly Fat Clay with Sand / Gravelly Elastic Silt with Sand

* LL = Liquid Limit

* PI = Plasticity Index

BORING LOG EXPLANATION



MOISTURE

DESCRIPTION	CRITERIA
DRY	Absence of moisture, dusty, dry to the touch
MOIST	Damp, but no visible water
WET	Visible free water, usually soil is below the water table

CONSISTENCY

DESCRIPTION	UNCONFINED SHEAR STRENGTH (KSF)	STANDARD PENETRATION (BLOWS/FOOT)
VERY SOFT	< 0.25	< 2
SOFT	0.25 - 0.5	2 - 4
FIRM	0.5 - 1.0	5 - 8
STIFF	1.0 - 2.0	9 - 15
VERY STIFF	2.0 - 4.0	16 - 30
HARD	> 4.0	> 30

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Boring Log Explanation - FGS
Greenfield Effluent Spray Fields
Greenfield, California

Figure No. 3
Project No. 22141
Date: 8/28/23

KEY TO SOIL CLASSIFICATION - COARSE GRAINED SOILS

UNIFIED SOIL CLASSIFICATION SYSTEM - ASTM D2487 (Modified)

MAJOR DIVISIONS		FINES	GRADE/TYPE OF FINES	SYMBOL	GROUP NAME *
GRAVEL	More than 50% of coarse fraction is larger than No. 4 sieve size	<5%	Cu ≥ 4 and 1 ≤ Cc ≤ 3	**GW**	Well-Graded Gravel / Well-Graded Gravel with Sand
			Cu < 4 and/or 1 > Cc > 3	**GP**	Poorly Graded Gravel/Poorly Graded Gravel with Sand
		5-12%	ML or MH	**GW - GM**	Well-Graded Gravel with Silt / Well- Graded Gravel with Silt and Sand
				GP - GM	Poorly Graded Gravel with Silt / Poorly Graded Gravel with Silt and Sand
			CL, CI or CH	**GW - GC**	Well-Graded Gravel with Clay / Well-Graded Gravel with Clay and Sand
				GP - GC	Poorly Graded Gravel with Clay / Poorly Graded Gravel with Clay and Sand
		>12%	ML or MH	**GM**	Silty Gravel / Silty Gravel with Sand
			CL, CI or CH	**GC**	Clayey Gravel/ Clayey Gravel with Sand
			CL - ML	**GC - GM**	Silty, Clayey Gravel/ Silty, Clayey Gravel with Sand
SAND	50% or more of coarse fraction is smaller than No. 4 sieve size	<5%	Cu ≥ 6 and 1 ≤ Cc ≤ 3	**SW**	Well-Graded Sand / Well-Graded Sand with Gravel
			Cu < 6 and/or 1 > Cc > 3	**SP**	Poorly Graded Sand / Poorly Graded Sand with Gravel
		5-12%	ML or MH	**SW - SM**	Well-Graded Sand with Silt / Well- Graded Sand with Silt and Gravel
				SP - SM	Poorly Graded Sand with Silt / Poorly Graded Sand with Silt and Gravel
			CL, CI or CH	**SW - SC**	Well-Graded Sand with Clay / Well-Graded Sand with Clay and Gravel
				SP - SC	Poorly Graded Sand with Clay / Poorly Graded Sand with Clay and Gravel
		>12%	ML or MH	**SM**	Silty Sand / Silty Sand with Gravel
			CL, CI or CH	**SC**	Clayey Sand / Clayey Sand with Gravel
			CL - ML	**SC - SM**	Silty, Clayey Sand / Silty, Clayey Sand with Gravel

* The term “with sand” refers to materials containing 15% or greater sand particles within a gravel soil, while the term “with gravel” refers to materials containing 15% or greater gravel particles within a sand soil.

US STANDARD SIEVE SIZE: 3 inch ¾ inch No. 4 No. 10 No. 40 No. 200 0.002 µm

	COARSE	FINE	COARSE	MEDIUM	FINE		
COBBLES AND BOULDERS	GRAVEL		SAND			SILT	CLAY

RELATIVE DENSITY

DESCRIPTION	STANDARD PENETRATION (BLOWS/FOOT)
VERY LOOSE	0 - 4
LOOSE	5 - 10
MEDIUM DENSE	11 - 30
DENSE	31 - 50
VERY DENSE	> 50

MOISTURE

DESCRIPTION	CRITERIA
DRY	Absence of moisture, dusty, dry to the touch
MOIST	Damp, but no visible water
WET	Visible free water, usually soil is below the water table

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Boring Log Explanation - CGS
Greenfield Effluent Spray Fields
Greenfield, California

Figure No. 4
Project No. 22141
Date: 8/28/23

LOGGED BY CMJ DATE DRILLED 8/10/23 BORING DIAMETER 12” BORING NO. P-1B

DRILL RIG Tri County-Excavator HAMMER TYPE N/A

Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N" Value	Pocket Pen. (tsf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200	Plasticity Index	Additional Lab Results
	P1-1 B	▯	**SILTY SAND:** Brown (10YR 5/3), poorly graded, very fine grained, non-plastic, significant organics, dry	SM				1.6		24.2		
1			**SILTY SAND:** Brown (10YR 4/3), poorly graded, very fine grained, non-plasticity, lack of organics, moist	SM								
2												
3	P1-2 B	▯						12.6		31.2		
4			Boring terminated at 4 feet. No groundwater encountered.									
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												

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Log of Test Borings
Greenfield Effluent Spray Fields
Greenfield, California

Figure No. 5
Project No. 22141
Date: 8/28/23

LOGGED BY CMJ DATE DRILLED 8/10/23 BORING DIAMETER 12” BORING NO. P-2B

DRILL RIG Tri County-Excavator HAMMER TYPE N/A

Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N" Value	Pocket Pen. (tsf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200	Plasticity Index	Additional Lab Results
	P2-1 B		**SILTY SAND:** Brown (10YR 5/3), poorly graded, very fine grained, no to low plasticity, organics present, dry	SM				6.0		21.0		
1												
2	P2-2 B		**SAND WITH SILT:** Brown (10YR 4/3), very fine grained, no plasticity, moist	SP -SM				7.4		8.6		
3			**SILTY SAND:** Brown (10YR 4/3), very fine grained, no plasticity, moist	SM								
4	P2-3 B							10.4		16.2		
			Boring terminated at 4 feet. No groundwater encountered.									
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												

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Log of Test Borings
Greenfield Effluent Spray Fields
Greenfield, California

Figure No. 6
Project No. 22141
Date: 8/28/23

LOGGED BY CMJ DATE DRILLED 8/10/23 BORING DIAMETER 12" BORING NO. P-3B

DRILL RIG Tri County-Excavator HAMMER TYPE N/A

Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N" Value	Pocket Pen. (tsf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200	Plasticity Index	Additional Lab Results
	P3-1 B		**SILTY SAND:** Brown (10YR 5/3), poorly graded, very fine grained, no to low plasticity, organics present, dry	SM				4.6		22.7		
1												
2	P3-2 B		Brown (10YR 4/3), poorly graded, very fine grained					8.1		12.6		
3												
4	P3-3 B		**SAND:** Light yellowish brown (10YR 6/4), poorly graded, very fine grained, moist	SP				4.1		4.0		
5			Boring terminated at 4 feet. No groundwater encountered.									
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												

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Log of Test Borings
Greenfield Effluent Spray Fields
Greenfield, California

Figure No. 7
Project No. 22141
Date: 8/28/23

Figure No. 8
Project No. 22141
Date: 8/28/23

SHALLOW QUICK INFILTROMETER TEST

Native Soil Assessment for Small Infiltration Based Stormwater Control Measures

Test Information

Test No.:	P-1B	*Test Date:*	8/11/2023	*Test By:*	MJM	*Job No.:*	22141
Location of Test:		N/W Area of Field					

Soil Information

% Gravel	0.0	*% Sand*	68.8	*% Fines*	31.2
USCS Description:		Silty Sand		*USCS Classification:*	SM

Test Configuration & Constants

Approx. Surface Elevation (ft.)	222.0	*Boring Depth (ft.)*	4.0
Approx. Bioswale Invert Elevation (ft.)	220.0	*Diameter of Test Boring (in.)*	12.0
Approx. Bottom of Boring Elevation (ft.)	218.0	*Cross-Section Area of Boring (in^2)*	113.1

Constant Head Infiltration Data

Interval		*Actual Time (hr:min)*	*Interval Time (min)*	*Water Head (in)*	*Initial Fill Volume (in^3)*	*Final Fill Volume (in^3)*	*Infiltration Rate (in/hr.)*
0	*Start*	1:35 PM	30	26.40	1085.70	3880.80	5.0
	End	2:05 PM					

Falling Head Infiltration Data

Interval		*Actual Time (hr:min)*	*Interval Time (min)*	*Flow Readings*		*Infiltration Volume (in^3)*	*Infiltration Rate (in/hr.)*
				Water Head (in)	*Change in Elev (in)*		
1	*Start*	2:05 PM	10	26.40	9.84	1112.88	7.2
	End	2:15 PM		16.56			
	Start	2:15 PM	10	16.56	5.16	583.58	5.5
	End	2:25 PM		11.40			
	Start	2:25 PM	10	11.40	4.08	461.44	5.9
	End	2:35 PM		7.32			
	Start	2:35 PM	10	7.32	3.24	366.44	6.7
	End	2:45 PM		4.08			
	Start	2:45 PM	10	4.08	1.68	190.00	4.8
	End	2:55 PM		2.40			
2	*Start*	2:55 PM	10	26.40	8.52	963.59	6.1
	End	3:05 PM		17.88			
	Start	3:05 PM	10	17.88	5.16	583.58	5.1
	End	3:15 PM		12.72			
	Start	3:15 PM	10	12.72	4.32	488.58	5.7
	End	3:25 PM		8.40			
	Start	3:25 PM	10	8.40	3.48	393.58	6.5
	End	3:35 PM		4.92			
	Start	3:35 PM	10	4.92	2.52	285.01	6.8
	End	3:45 PM		2.40			
3	*Start*	3:45 PM	10	26.40	9.48	1072.16	6.9
	End	3:55 PM		16.92			
	Start	3:55 PM	10	16.92	4.56	515.72	4.7
	End	4:05 PM		12.36			

Test Results

Infiltration Rate, I_t (in/hr):	5.6	Factored Infiltration Rate, K_f (in/hr)**:	2.8

**K_f includes a factor of safety of 2.

Figure No. 9
Project No. 22141
Date: 8/28/23

SHALLOW QUICK INFILTROMETER TEST

Native Soil Assessment for Small Infiltration Based Stormwater Control Measures

Test Information

Test No.:	P-2B	*Test Date:*	8/16/2023	*Test By:*	MJM	*Job No.:*	22141
Location of Test:		S/Center Area of Field					

Soil Information

% Gravel	0.9	*% Sand*	82.9	*% Fines*	16.2
USCS Description:		Silty Sand		*USCS Classification:*	SM

Test Configuration & Constants

Approx. Surface Elevation (ft.)	222.0	*Boring Depth (ft.)*	3.9
Approx. Bioswale Invert Elevation (ft.)	220.1	*Diameter of Test Boring (in.)*	12.0
Approx. Bottom of Boring Elevation (ft.)	218.1	*Cross-Section Area of Boring (in^2)*	113.1

Constant Head Infiltration Data

Interval		*Actual Time (hr:min)*	*Interval Time (min)*	*Water Head (in)*	*Initial Fill Volume (in^3)*	*Final Fill Volume (in^3)*	*Infiltration Rate (in/hr.)*
0	*Start*	9:20 AM	30	24.00	1155.00	3834.60	5.3
	End	9:50 AM					

Falling Head Infiltration Data

Interval		*Actual Time (hr:min)*	*Interval Time (min)*	*Flow Readings*		*Infiltration Volume (in^3)*	*Infiltration Rate (in/hr.)*
				Water Head (in)	*Change in Elev (in)*		
1	*Start*	9:50 AM	10	24.00	12.96	1465.74	11.4
	End	10:00 AM		11.04			
	Start	10:00 AM	10	11.04	4.92	556.44	7.6
	End	10:10 AM		6.12			
	Start	10:10 AM	10	6.12	4.44	502.15	11.6
	End	10:20 AM		1.68			
	Start	10:20 AM	10	1.68	1.68	190.00	7.9
	End	10:30 AM		0.00			
2	*Start*	10:30 AM	10	24.00	11.04	1248.59	9.3
	End	10:40 AM		12.96			
	Start	10:40 AM	10	12.96	4.80	542.87	6.4
	End	10:50 AM		8.16			
	Start	10:50 AM	10	8.16	3.72	420.72	7.2
	End	11:00 AM		4.44			
	Start	11:00 AM	10	4.44	2.88	325.72	8.6
	End	11:10 AM		1.56			
3	*Start*	11:10 AM	10	24.00	10.44	1180.74	8.6
	End	11:20 AM		13.56			
	Start	11:20 AM	10	13.56	5.52	624.30	7.2
	End	11:30 AM		8.04			
	Start	11:30 AM	10	8.04	3.36	380.01	6.5
	End	11:40 AM		4.68			
	Start	11:40 AM	10	4.68	2.88	325.72	8.3
	End	11:50 AM		1.80			

Test Results

Infiltration Rate, I_t (in/hr):	6.3	Factored Infiltration Rate, K_f (in/hr)**:	3.1

**K_f includes a factor of safety of 2.

Figure No. 10
Project No. 22141
Date: 8/28/23

SHALLOW QUICK INFILTROMETER TEST

Native Soil Assessment for Small Infiltration Based Stormwater Control Measures

Test Information

Test No.:	P-3B	*Test Date:*	8/16/2023	*Test By:*	MJM	*Job No.:*	22141
Location of Test:		S/Center Area of Field					

Soil Information

% Gravel	0.0	*% Sand*	96.0	*% Fines*	4.0
USCS Description:		Sand		*USCS Classification:*	SP

Test Configuration & Constants

Approx. Surface Elevation (ft.)	222.0	*Boring Depth (ft.)*	4.2
Approx. Bioswale Invert Elevation (ft.)	219.8	*Diameter of Test Boring (in.)*	12.0
Approx. Bottom of Boring Elevation (ft.)	217.8	*Cross-Section Area of Boring (in^2)*	113.1

Constant Head Infiltration Data

Interval		*Actual Time (hr:min)*	*Interval Time (min)*	*Water Head (in)*	*Initial Fill Volume (in^3)*	*Final Fill Volume (in^3)*	*Infiltration Rate (in/hr.)*
0	*Start*	11:55 AM	30	24.00	1131.90	3811.50	5.3
	End	12:25 PM					

Falling Head Infiltration Data

Interval		*Actual Time (hr:min)*	*Interval Time (min)*	*Flow Readings*		*Infiltration Volume (in^3)*	*Infiltration Rate (in/hr.)*
				Water Head (in)	*Change in Elev (in)*		
1	*Start*	12:25 PM	10	24.00	13.32	1506.46	11.8
	End	12:35 PM		10.68			
	Start	12:35 PM	10	10.68	6.00	678.58	10.1
	End	12:45 PM		4.68			
	Start	12:45 PM	10	4.68	3.48	393.58	10.5
	End	12:55 PM		1.20			
2	*Start*	12:55 PM	10	24.00	11.76	1330.02	10.0
	End	1:05 PM		12.24			
	Start	1:05 PM	10	12.24	5.64	637.87	8.2
	End	1:15 PM		6.60			
	Start	1:15 PM	10	6.60	3.36	380.01	7.6
	End	1:25 PM		3.24			
	Start	1:25 PM	10	3.24	2.40	271.43	8.6
	End	1:35 PM		0.84			
3	*Start*	1:35 PM	10	24.00	9.48	1072.16	7.7
	End	1:45 PM		14.52			
	Start	1:45 PM	10	14.52	5.76	651.44	7.1
	End	1:55 PM		8.76			
	Start	1:55 PM	10	8.76	3.60	407.15	6.5
	End	2:05 PM		5.16			
	Start	2:05 PM	10	5.16	2.64	298.58	6.9
	End	2:15 PM		2.52			
	Start	2:15 PM	10	2.52	1.68	190.00	6.5
	End	2:25 PM		0.84			

Test Results

Infiltration Rate, I_t (in/hr):	5.4	Factored Infiltration Rate, K_f (in/hr)**:	2.7

**Kf includes a factor of safety of 2.

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Appendix E
Floodplain Modeling

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DRAFT FOR REVIEW – May 31, 2023

ADVANCED HYDRO ENGINEERING
TECHNICAL REPORT NO. 1

CITY OF GREENFIELD, CA

PRELIMINARY FLOODPLAIN MODEL OF SALINAS RIVER NEAR CITY WASTEWATER TREATMENT AND DISPOSAL FACILITIES

DATE: May 31, 2023

AUTHOR: Dr. Jeff Lewandowski, PE C52503,
Advanced Hydro Engineering, Inc. (AHE)

1. Purpose

The purpose of this report is to summarize a preliminary floodplain model study of the Salinas River near the City of Greenfield, CA (City) in Monterey County (County). This study was performed to provide a preliminary floodplain analysis to establish an approximate base (100-year) flood elevations (BFE) at the City’s wastewater treatment and disposal facilities.

The City is developing potential improvements to their wastewater treatment and disposal facilities which are located within the Federal Emergency Management Agency (FEMA) Special Flood Hazard Area (SFHA). The SFHA is designated Zone A, No Base Flood Elevations determined. A BFE is needed to compare with the existing elevations of the WWTP site and proposed facility improvements to determine areas that may be subject to flooding during a 100-year event. The identification of the BFE will determine any new construction areas of the treatment and disposal sites that will need to be elevated and/or protected by a levee or floodwall to meet City and County codes.

2. Summary and Key Findings

The results of the preliminary floodplain modeling indicated that flooding of both the main riparian channel and the agricultural overbank areas will occur in the 100-year event. The levees separating the agricultural production and riparian areas were overtopped by the 100-year flood flows at some of the model cross sections in the study area. No levee overtopping analyses were performed for this study.

2.1 Key Parameters Utilized in Model Approach

Some of the key parameters and approaches utilized in the modeling included:

1) Base (100-Year) Flow Rate – The base flow rate was 86,000 cubic feet per second (cfs). Based on a flow split calculation in the preliminary model, the main channel and right overbank flow was estimated to convey about 76,000 cfs and the left overbank channel flow rate was estimated at about 10,000 cfs.

2) Manning’s n Values – A Manning’s n value of 0.06 was used in the main channel and was higher than the Manning’s n values of 0.035 used in the overbank areas. This approach was based on larger vegetation sizes and denser vegetation cover in the main channel. These conditions were observed in recent aerial and panoramic street photos.

3) Impact of Existing Levees along Salinas River - There are no accredited levees within the study area. Levees along the edge of the riparian area of the river were included in model cross section topography but were not considered as providing any flood protection to the floodplain or overbank areas.

4) Impact of Storage and Disposal Basin Structure (Basin Structure) in Floodplain– The basin structure was constructed upon a relatively higher elevation section of the floodplain. The levees surrounding the basin structure were presumed to create an obstruction within the floodplain. Flood flows were presumed to pass around the basin structure perimeter. The banks of this structure have not been reviewed for adequacy to protect facilities during a 100-year event.

5) The flow in the river was split into two separate reaches in the area near the basin structure. The flow rate in each of the adjacent reaches was based on matching the water surface elevations in each reach at the upstream end of the basin structure.

2.2 Key Study Findings

Some of the key study findings included:

1) No base (100-year) flood water surface elevations have been developed for the Salinas River near Greenfield. The current effective base (100-year) flood water surface elevation in this area was developed from approximate methods. There were no previous HEC-2 models developed to determine water surface elevations near the City treatment and disposal facilities. Detailed methods and HEC-2 models were previously developed on limited length reaches of the Salinas River outside of the study area.

2) A new HEC-RAS model must be developed to determine water surface elevations near the City facilities. A preliminary HEC-RAS model of a limited area near the City treatment and disposal facilities was developed in this study. This preliminary model is to be used for initial consultation with County and FEMA regarding any detailed analyses required for development of a Conditional Letter of Map Revision (CLOMR) for this area.

3) The BFE developed in the preliminary HEC-RAS model of the study area near the City treatment and disposal facilities extended across the northeastern corner of the treatment plant site. This flooding area limit was similar to the approximate Zone A flooding area limits shown on the effective Flood Insurance Rate Map (FIRM).

4) The base (100-year) flood water surface elevations will exceed the top of the levee or rise to within one foot of the top of the levees at some cross sections on both sides of the riparian channel within the study area.

5) The wastewater storage and percolation ponds were constructed on an elevated area within the overbank floodplain (collectively termed the basin structure or basin). The current basin location constricts the flood flows conveyed in the left (western) overbank area adjacent to the treatment plant.

6) The estimated BFE from the preliminary model ranged from 221.44 ft to 222.74 ft at the cross sections in the overbank area near the treatment plant site. Some perimeter ground elevations at the existing treatment plant site are lower than 221.4 ft and must be raised

or protected from flooding to meet City and County code requirements for new development.

7) The estimated BFE from the preliminary model were lower than the top of bank around the perimeter of the storage and percolation basins structure. The minimum freeboard along the perimeter of the basin structure was about four feet.

8) The existing elevations within the left overbank area create a rise in the overbank channel bottom elevation upstream of the treatment plant. A hydraulic condition termed "critical depth" occurs at a flow cross section near the treatment plant site. The critical depth condition is associated with high flow velocities. The velocity exceeded 6 ft/sec in the overbank area at that cross section. These high velocities may cause erosion during peak flooding events.

2.3 Limitations of this Study

This preliminary floodplain model study was developed to provide the potential BFE necessary for design of treatment and disposal facilities and for a preliminary investigation for a future detailed study of this section of the Salinas River.

This study included review of potential left overbank flow rates in the study area. These rates will be dependent on the flow characteristics presumed along the levee system and the upstream roadway crossings at Elm Avenue. For this study, flow was presumed to cross the levees during the base flood event. The roadway crossing at Elm Avenue was not included in the study area.

This study is preliminary only and is not a certification of flooding levels along the Salinas River or intended to be utilized for accreditation of the levee system.

The banks surrounding the storage and disposal basins were presumed to act as a barrier to prevent flow from passing through the structure. The structural stability of the banks is not known. Further study of the competence of the structure banks during peak flow events may be needed as part of the design.

No levee overtopping analyses were performed for this study.

Current Manning's n estimates were developed from aerial photography from Google Earth and from panoramic photos at Elm Avenue from Google Street View. No site visit was performed. Manning's n estimates may be modified based on further investigation.

Additional analyses may be necessary to develop a Conditional Letter of Map Revision (CLOMR) for this site. This study is anticipated to be used in discussions with County and FEMA officials in development of the additional analyses required for a CLOMR.

3. Approach and Background

3.1 Approach

The approach for the preliminary floodplain analysis included the following:

1) Review of available flooding information in the Flood Insurance Study (FIS) and FIRM.

2) Coordination with FEMA to request the current effective hydraulic analysis models (presumed to be HEC-2 format) for reaches of the Salinas River channel near the WWTP.
3) Review available HEC-2 modeling information available for the Salinas River at nearby locations.
4) Develop a new limited length HEC-RAS model of the river channel near the City of Greenfield wastewater treatment and disposal facilities.

3.2 Background and Review of Previous Modeling

The City of Greenfield is located in Monterey County, CA and is within the Salinas River watershed. The City does not have a separate FIS and information regarding flooding is included in the effective Monterey County FIS. The effective County FIS is dated April 2, 2009. An updated preliminary County FIS dated October 21, 2021 has been issued but has not yet become effective. The current effective FIRMs for the City dated April 2, 2009 were not changed in the preliminary County FIS. As a result, no change is expected for City FIRMs when the preliminary County FIS becomes effective.

The effective FIRM for the City is the Monterey County, California Panel 850 of 2050, Map Number 06053C0850G with effective date April 2, 2009. The FIRM delineates the SFHA subject to inundation by the 1 percent annual chance (100-Year) flood. The SFHA along the Salinas River near Greenfield is shown on Figure 1. The City boundaries within the SFHA shown on Figure 1 include a portion of the treatment plant site, a majority of the storage and infiltration basins, and a portion of the riparian main channel area. The access road to the basin area is also within City boundaries. Some of the infiltration basins along the southeastern side of the basin structure are outside of City boundaries and within County unincorporated area.

The SFHA was designated as Zone A, No Base Flood Elevations determined. The inundation area was determined by approximate methods which do not provide a BFE. No detailed hydraulic study has been performed for the Salinas River near the City to determine the BFEs.

Based on the effective County FIS and the historic FIS from September 1991, detailed hydraulic studies of the Salinas River were performed for three segments using the Corps of Engineers (COE) HEC-2 step-backwater software. The first segment was about 19 river miles near the mouth, and the two others were shorter segments upstream of the City. The upstream segments were two to three river mile length segments near King City and San Ardo.

An information request for model information was provided to FEMA. Based on review of their records, FEMA did not have electronic copies of the original HEC-2 modeling performed for the Salinas River in the late 1970s. However, HEC-2 model output information from that modeling was obtained by the County from FEMA and provided to AHE for review for this study.

The Manning's n values from the original HEC-2 models for the Salinas River near King City developed in September 1979 were reviewed for potential use in this study. The Manning's n values used in the original HEC-2 models were 0.03 for the main channel and 0.05 for the overbank area. Some additional calibration model runs performed at that time used Manning's n values which were near those values.

The topography and structures within the approximate study area are shown on Figure 2. The floodplain is bounded by the Gabilan Range on the east and by an approximate 20 ft drop in

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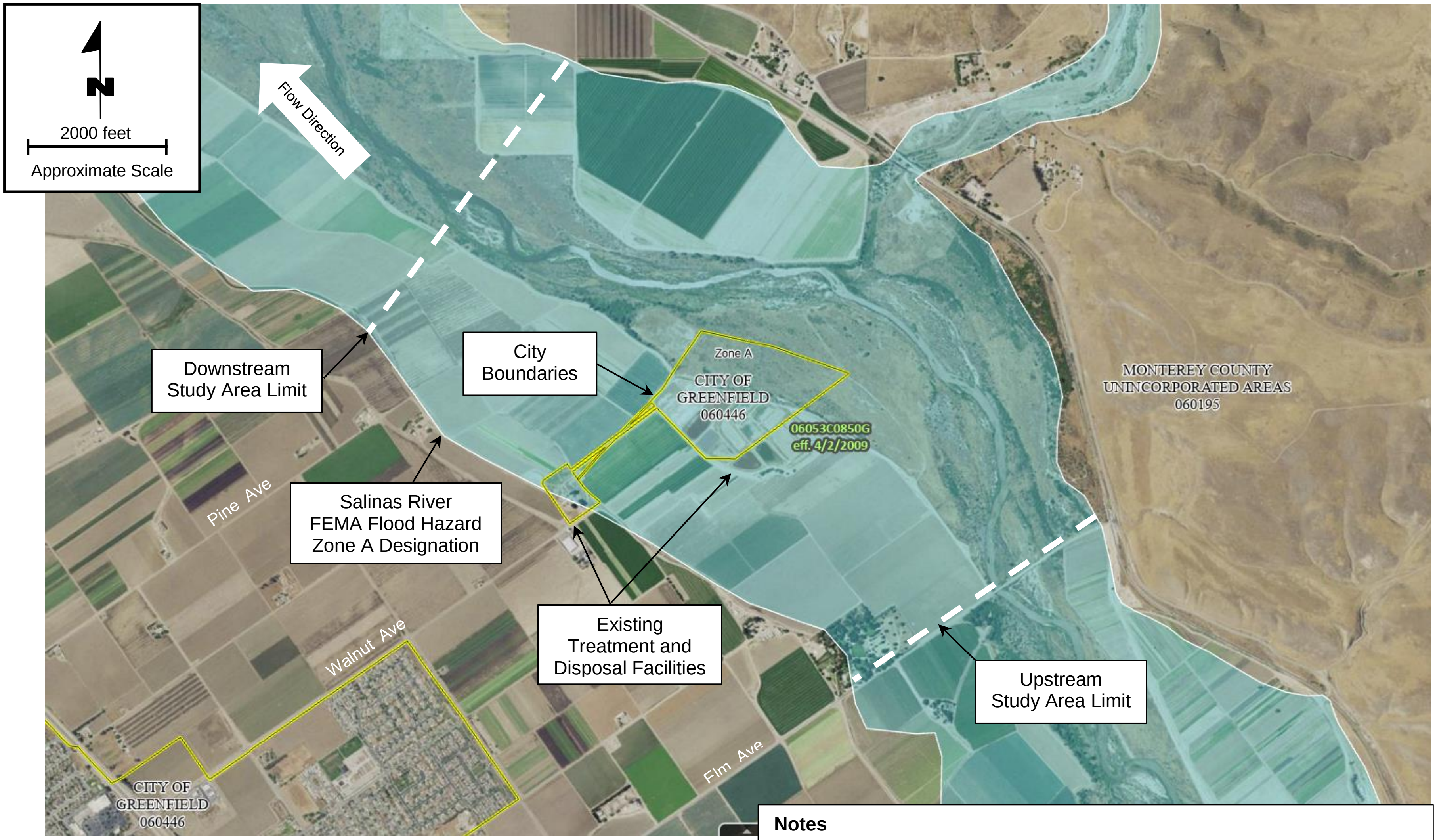

Notes

1. Base Map obtained from FEMA's National Flood Hazard Layer (NFHL) Viewer. Data Refreshed December 2021.
2. The Zone A designation was developed using approximate methods. No Base (100-year) Flood Elevations (BFEs) were determined (Map No. 06053C0850G).

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Preliminary Floodplain Modeling – Greenfield, CA

FEMA Special Flood Hazard Area
Zone A – No Base Flood Elevations Determined

Figure
1

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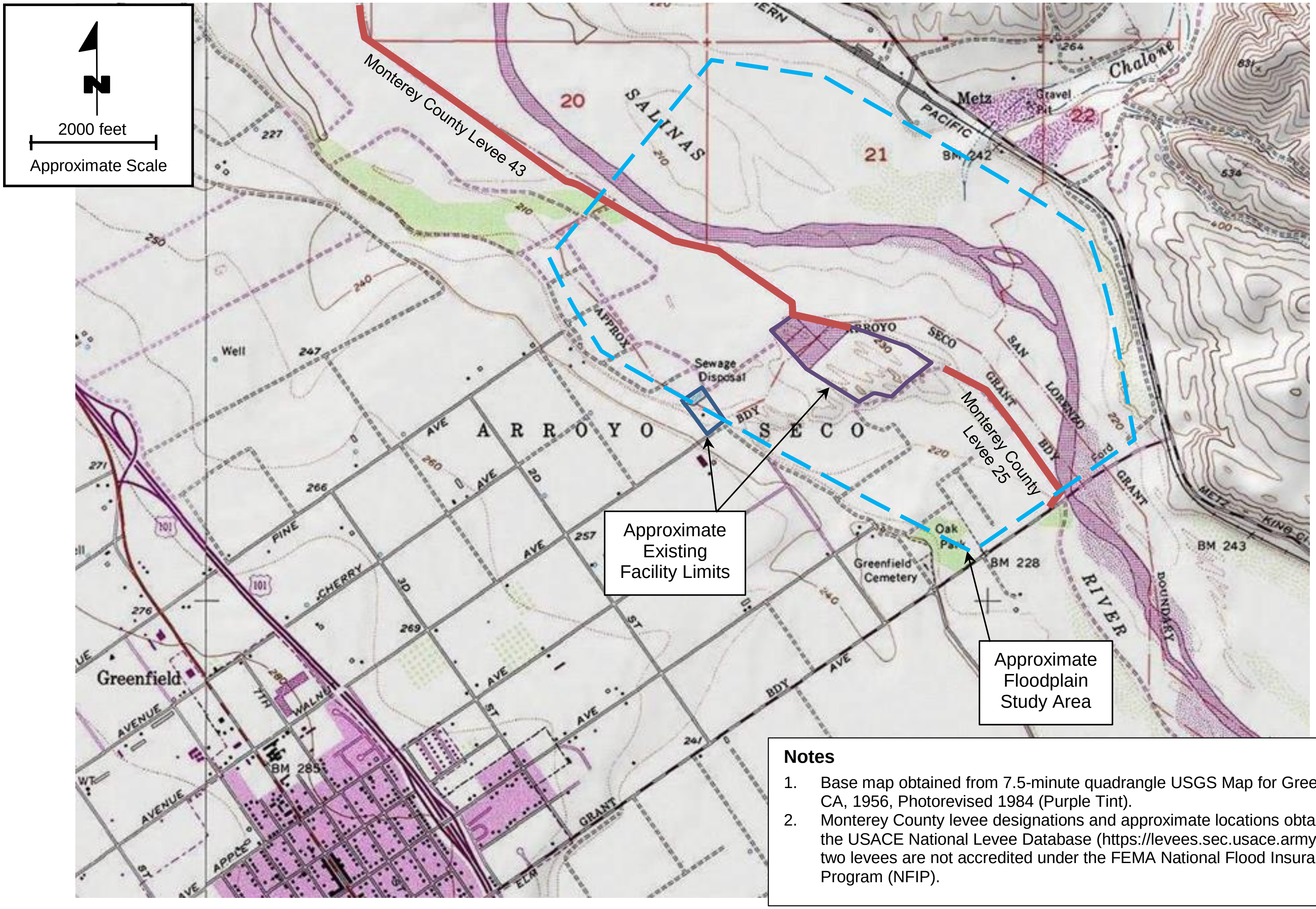

Notes

1. Base map obtained from 7.5-minute quadrangle USGS Map for Greenfield, CA, 1956, Photorevised 1984 (Purple Tint).
2. Monterey County levee designations and approximate locations obtained from the USACE National Levee Database (https://levees.sec.usace.army.mil/). The two levees are not accredited under the FEMA National Flood Insurance Program (NFIP).

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Preliminary Floodplain Modeling – Greenfield, CA

Salinas River Floodplain
Approximate Study Area

Figure
2

May 30, 2023

ground elevation along the west. The approximate limits of the existing treatment and disposal facilities are shown on Figure 2. The storage and percolation basins were constructed upon a ridge within the floodplain. The original elevations of the ridge in the floodplain were as high as 240 feet based on the USGS topography from 1956. The initial storage basins at the north end of the existing basin structure were in place in 1984 based on the photorevised modifications on the USGS topography.

Levees are located along both sides of the riparian areas of the main channel in the study area. The levees separate the riparian areas of the channel and floodplain from the agricultural production areas on the floodplain. About 4 miles of these levees on the west side of the main channel are listed in the Corps of Engineers (COE) National Levee Database. These include Monterey County Levee 43 and Monterey County Levee 25. The status of their certification is not known. These levees are identified as non-accredited in the COE database. Since the levees are non-accredited, they will not be shown on a FIRM as reducing the base (100-year) flood hazards.

The Chalone Creek discharges into the Salinas River near Metz at the study area boundary. This creek watershed area is small relative to the Salinas River watershed at this location. The flows from Chalone Creek were presumed to have no significant impact on the 100-year flow rate in the Salinas River.

3.3 Preliminary Modeling Approach

The study limits for the preliminary modeling are shown on Figure 1 and Figure 2. Some of the key modeling approaches and parameters included:

1) Base (100-Year) Flow Rate - The 100-year flow estimate of 86,000 cfs was equivalent to the flow rate identified at King City. Based on FIS information, the flows remain constant or decrease slightly in the downstream direction due to infiltration into the riverbed. The 86,000 cfs flow rate is considered an appropriate estimate due to the downstream proximity of the City of Greenfield to King City.

2) Manning's n Values for Preliminary Model - In general, the Manning's n values selected for the riparian areas of the main channel were higher than those used in previous HEC-2 detailed modeling for the Salinas River near King City. The Manning's n values used for the main channel in this study were n = 0.06 compared with n = 0.03 used in the 1979 original modeling. In contrast, the Manning's n values used for the overbank area in this study were lower than those used in HEC-2 detailed modeling for the Salinas River near King City. The preliminary model overbank Manning's n value was n = 0.035 compared with n = 0.05 used in the 1979 original modeling. These values were modified based on the larger sized and denser vegetation cover in the main channel observed from recent aerial and panoramic street view photos. Further review of the Manning's n values may be necessary.

3) Impact of Existing Levees along Salinas River. There are no accredited levees within the study area. Levees along the edge of the riparian area of the river were included in model cross section topography but were not considered as providing any flood protection to the floodplain areas.

4) Impact of Storage and Disposal Basin Structure (Basin Structure) in Floodplain– The basin structure was constructed upon a relatively higher elevation area within the floodplain. The higher elevations and the levees surrounding the basin structure were presumed to create an obstruction within the floodplain. Flood flows were presumed to pass around the basin structure perimeter.

5) River Reach Layout - To accommodate flow around the basin structure perimeter, the flow in the river was split into two separate reaches in the area adjacent to the basin structure. The flow rate in each reach was based on matching the water surface elevations in each reach at the upstream end of the basin structure. An iterative process was utilized to identify the main channel and overbank flow rates.

6) Cross Section Locations and Elevations– The model cross section locations are shown on Figures 3 and 4. The levee locations delineate the overbank areas from the main channel flow. As noted previously, the basin structure is considered to provide a barrier to flow. Flow is split at the upstream end of the basin structure (River Station (RS) 322+00 on the main channel and RS 318+00 on the left overbank). The flow is combined at the downstream end of the basin following RS 299+00. Cross section elevations were obtained from Google Earth information. This topographic information appeared to be equivalent to the GIS topographic information provided by County staff. The river stations for left overbank cross section locations are shown on Figure 4. These sections are more numerous to accommodate the abrupt changes in ground elevation that are present in the overbank area.

4. Preliminary Model Results

The BFE results from the preliminary model for the reaches near the treatment facilities are listed in Table 1 and shown on the water surface profile on Figure 5. The flooding limits for the water surface elevations near the treatment plant were similar to those shown on the effective FIRM. The existing ground surface elevations of the northeastern areas of the treatment plant are generally less than the BFE calculated with the preliminary model.

TABLE 1 BASE (100-YEAR) FLOOD ELEVATIONS NEAR TREATMENT AND DISPOSAL FACILITIES

Reach and Station	Location	Water Surface Elevation	Existing Adjacent Bank Elevations[1]
Overbank Area (10,000 cfs)			
Station 299+00	Northeast WWTP Site	221.44	Less than 221 ft
Station 306+10	South WWTP Boundary	222.74	225 ft to 245 ft
Station 318+00	Southwest Basin Perimeter	226.24	233 ft to 236 ft
Main Channel (76,000 cfs)			
Station 299+00	Northeast Basin Perimeter	221.44	228 ft to 229 ft
Station 322+00	Southeast Basin Perimeter	226.20	230 ft to 232 ft

[1] The banks have not been reviewed for adequacy to protect facilities during a 100-year event.

Since perimeter ground elevations at the existing treatment plant site are lower than 221.4 ft, they must be raised or protected from flooding to meet City and County code requirements for new development. Around the perimeter of the storage and percolation basins structure, the estimated BFE from the preliminary model were lower than the basin top of bank. The minimum freeboard along the perimeter of the basin structure was about four feet.

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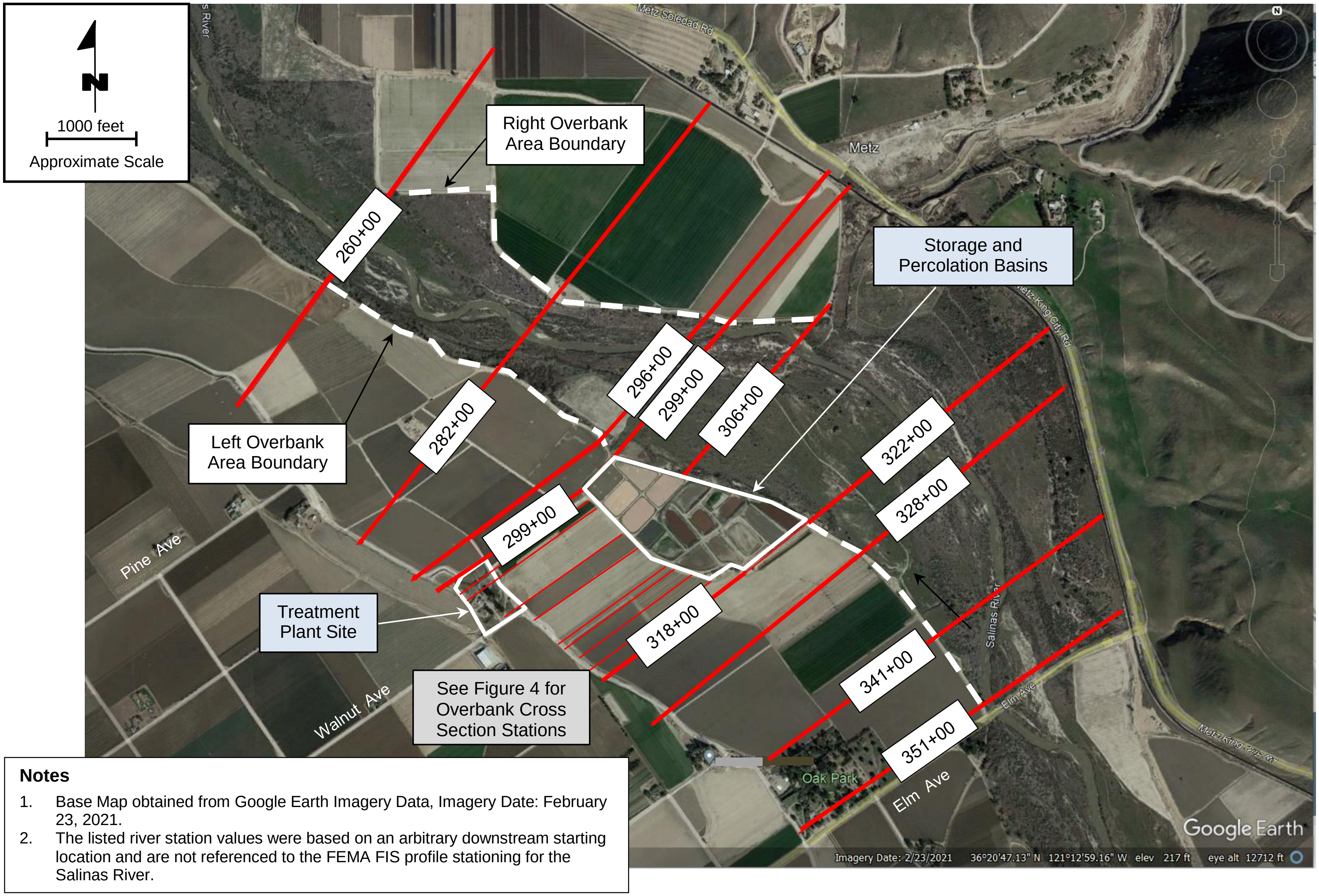

Notes

1. Base Map obtained from Google Earth Imagery Data, Imagery Date: February 23, 2021.
2. The listed river station values were based on an arbitrary downstream starting location and are not referenced to the FEMA FIS profile stationing for the Salinas River.

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Preliminary Floodplain Modeling – Greenfield, CA

Preliminary Floodplain Modeling
Model Cross Sections

Figure
3

May 30, 2023

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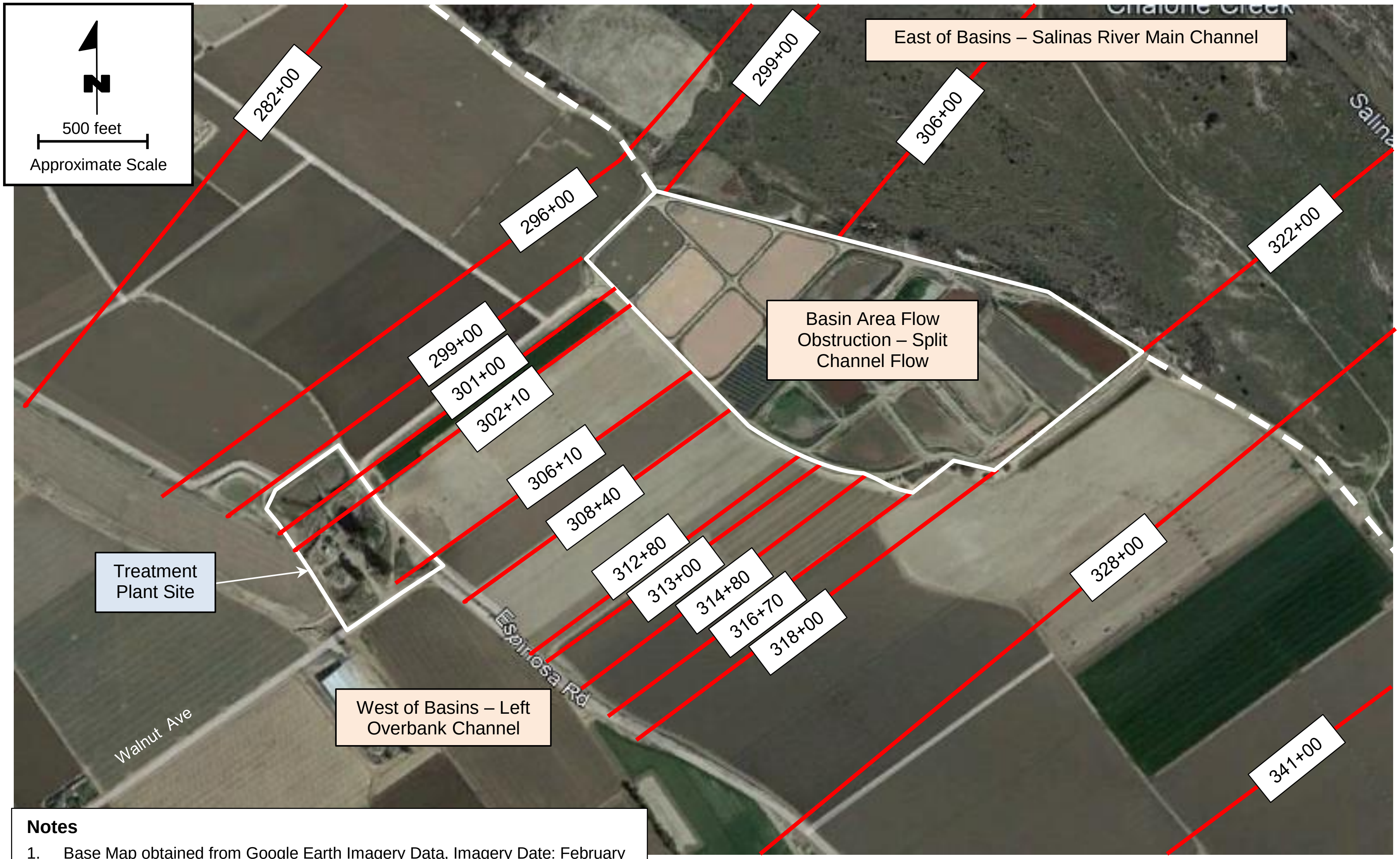

Notes

1. Base Map obtained from Google Earth Imagery Data, Imagery Date: February 23, 2021.

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Preliminary Floodplain Modeling – Greenfield, CA

Left Overbank Floodplain Modeling
Left Overbank Model Cross Sections

Figure
4

May 30, 2023

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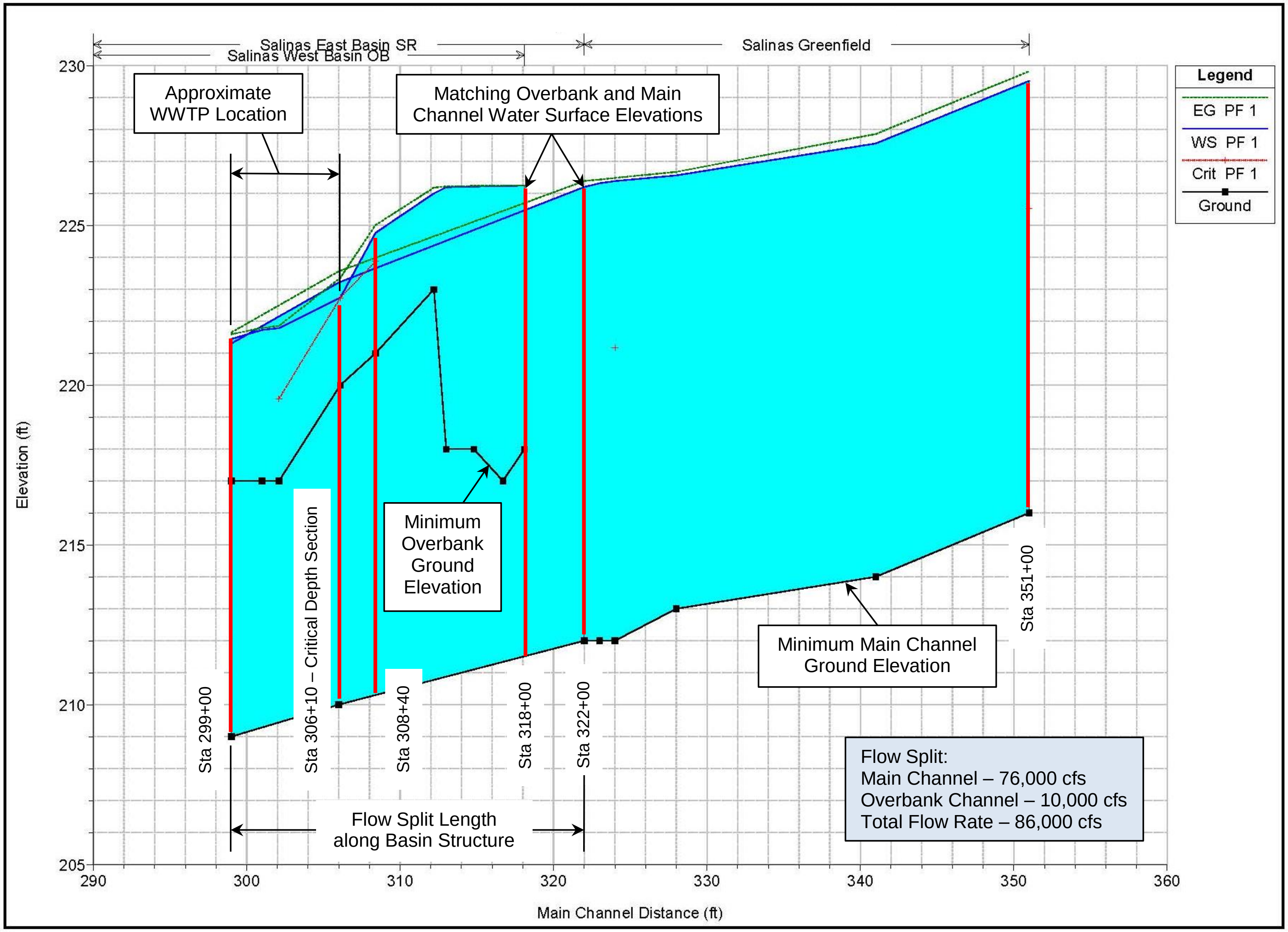


Preliminary Floodplain Modeling – Greenfield, CA

Water Surface Profiles Near Treatment and Disposal Facilities

Figure

5

The calculated flow split adjacent to the basin structure was 76,000 cfs in the main channel and 10,000 cfs in the left overbank. As shown on Figure 5, the minimum overbank ground elevations were generally five feet higher than the main channel minimum ground elevation. At some cross sections, the minimum ground surface elevations in the overbank area were 10 feet above the main channel minimum ground elevations.

Selected cross sections in the reach upstream of the basins are shown on Figure 6. The total flow rate is 86,000 cfs at each cross section. The Manning's n values for each section are listed at the top of each cross section. The County Levee 25 was slightly overtopped in the area near RS 341+00. Levees along the edge of the riparian area of the river were included in model cross section topography, but were not considered as providing any flood protection to the floodplain areas. Since the levees are not accredited, flows were allowed to pass between the main channel and overbank areas where water levels were below the top of the levee.

Selected cross sections in the reach downstream of the basins are shown on Figure 7. The total flow rate is 86,000 cfs at each cross section. This reach includes overbank sections on both sides of the main channel. The Manning's n values for each section are listed at the top of each cross section. The County Levee 43 was slightly overtopped in the area near RS 260+00 at the downstream end of the study area. At this station, the top of levee elevation for the right overbank is within one foot of the BFE. Similar to upstream of the basins, flows were allowed to pass between the main channel and overbank areas where water levels were below the top of the levee since the levees are not accredited.

Selected cross sections in the overbank channel reach west of the basins are shown on Figure 8. The total flow rate in this overbank area is 10,000 cfs. The 10,000 cfs was calculated by an iterative method. The overbank flow rates were varied until the water surface elevation at RS 318+00 in the overbank channel was approximately equal to the water surface elevation at RS 322+00 in the main channel. The Manning's n value was 0.035 for the overbank area. The RS 299+00 cross section was slightly downstream of the treatment facility.

The RS 306+10 cross section in the overbank section was located at the southern treatment plant boundary. A hydraulic condition termed "critical depth" occurs at this flow cross section and is noted on Figure 5. The critical depth condition is associated with high flow velocities exceeding 6 ft/s in the overbank area at that cross section. This condition which may cause erosion during peak flooding events.

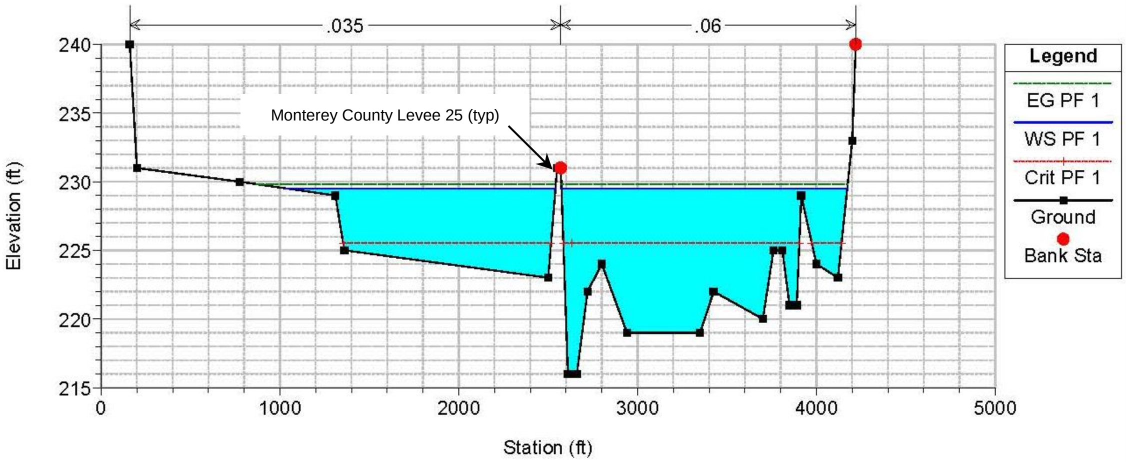
5. Potential Additional Modeling and Other Related Studies

This preliminary floodplain model study was developed to provide the potential BFE necessary for design of treatment and disposal facilities and for a preliminary investigation for a future detailed study of this section of the Salinas River.

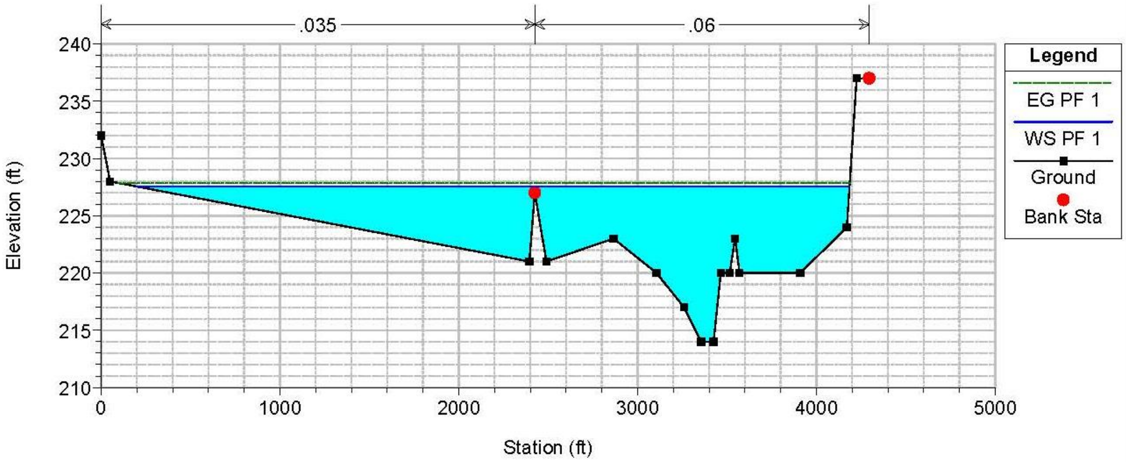
Additional analyses may be necessary to develop a Conditional Letter of Map Revision (CLOMR) for this site. This study is anticipated to be used in discussions with County and FEMA officials in development of the additional analyses required for a CLOMR.

This study included review of potential left overbank flow rates in the study area. These rates will be dependent on the flow characteristics presumed along the levee system and at roadway crossings such as Elm Avenue. For this study, flow was presumed to cross the levees during the base flood event. The roadway crossing at Elm Avenue was not included in the study area.

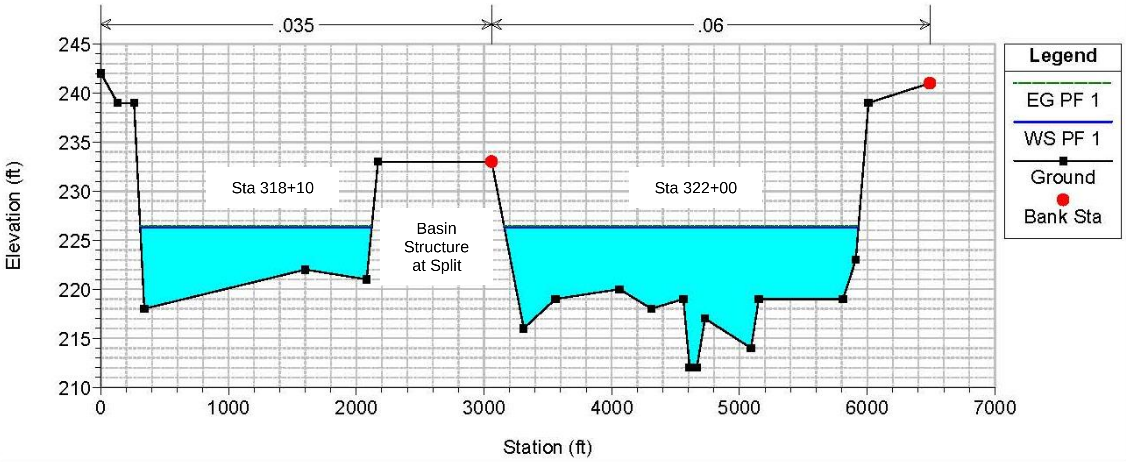
River Station 351+00 – Near Elm Avenue



River Station 341+00



River Station 322+00 and 318+10 – Near Basins



Notes

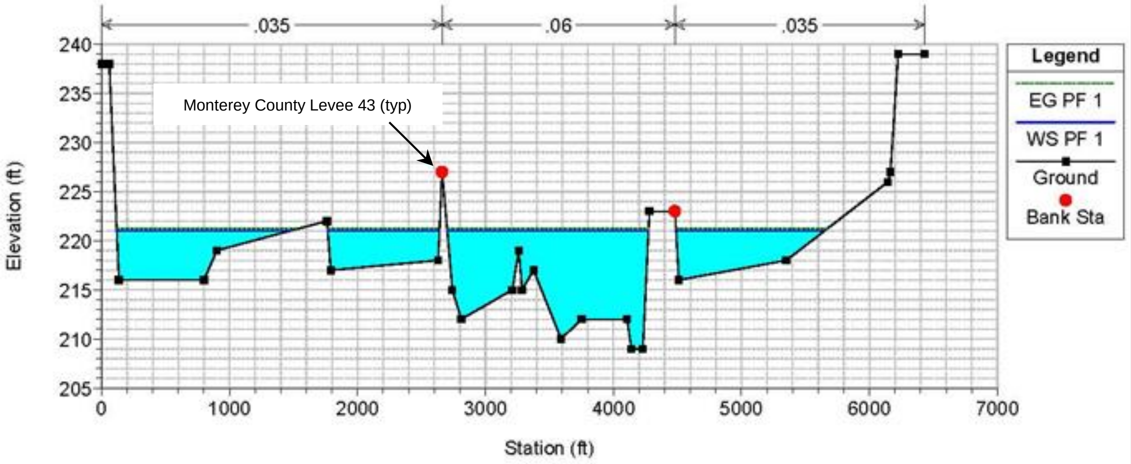
1. Cross section view is looking downstream. The left side of the cross section is the western edge of the Salinas River floodplain.

Preliminary Floodplain Modeling – Greenfield, CA

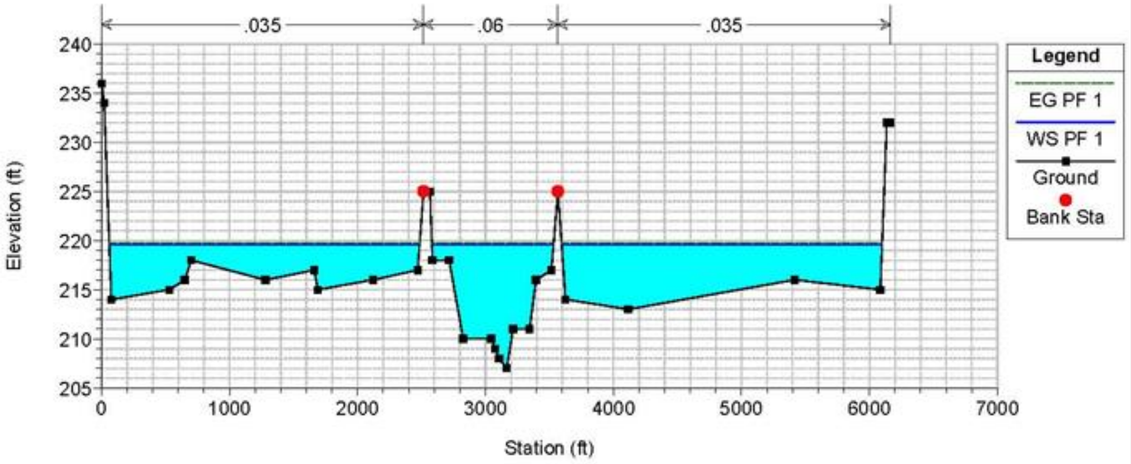
Salinas River Model Cross Sections
Upstream of Basin Structure and Flow Split

Figure
6

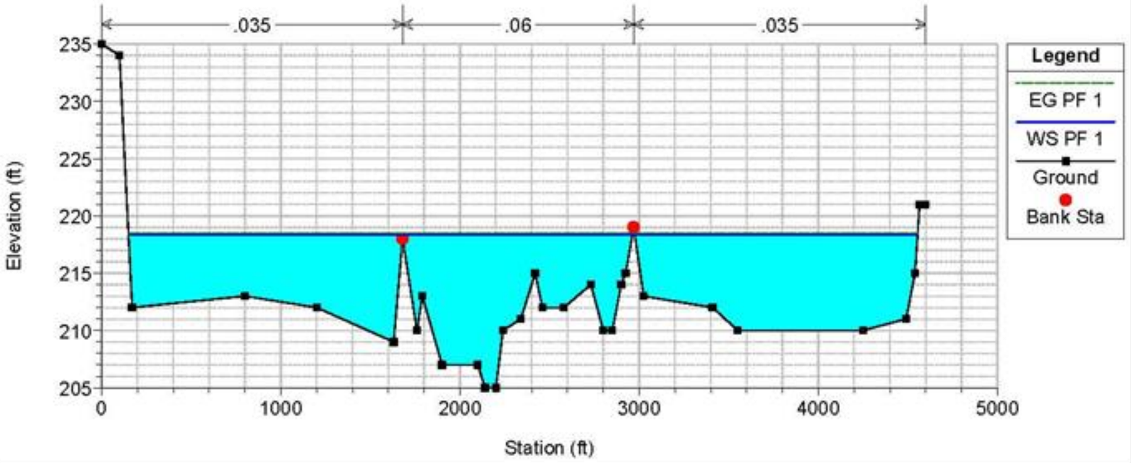
River Station 296+00 – Downstream of Basin Structure



River Station 282+00



River Station 260+00



Notes

1. Cross section view is looking downstream. The left side of the cross section is the western edge of the Salinas River floodplain.

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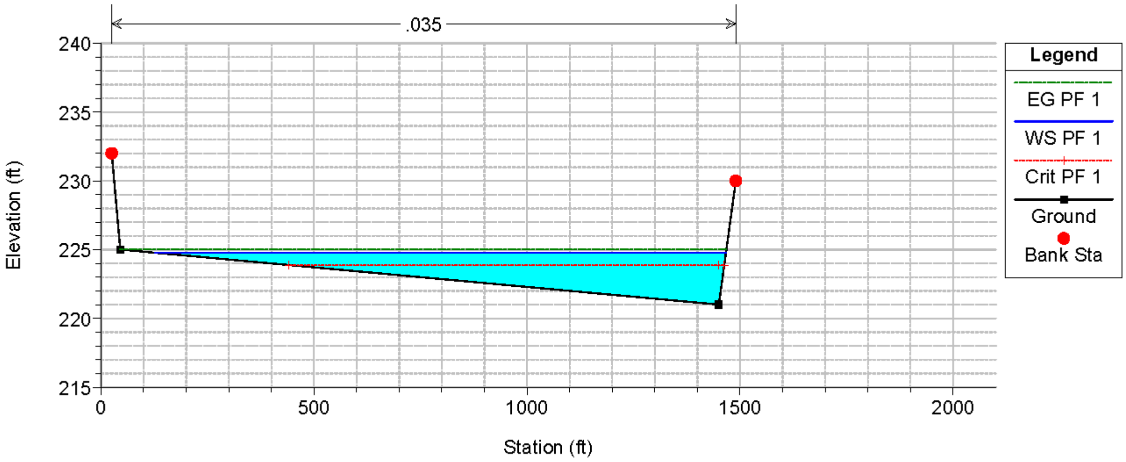
Preliminary Floodplain Modeling – Greenfield, CA

Salinas River Model Cross Sections
Downstream of Basin Structure

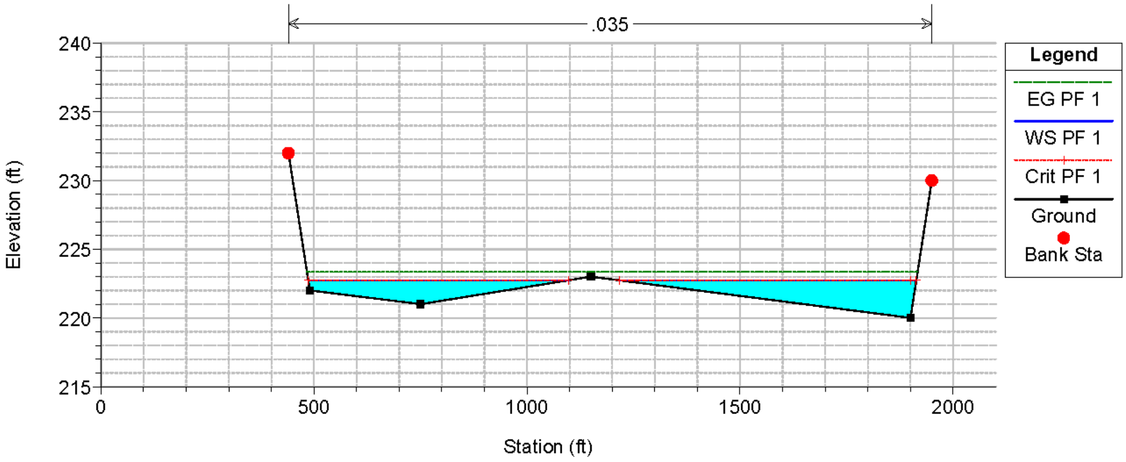
Figure

7

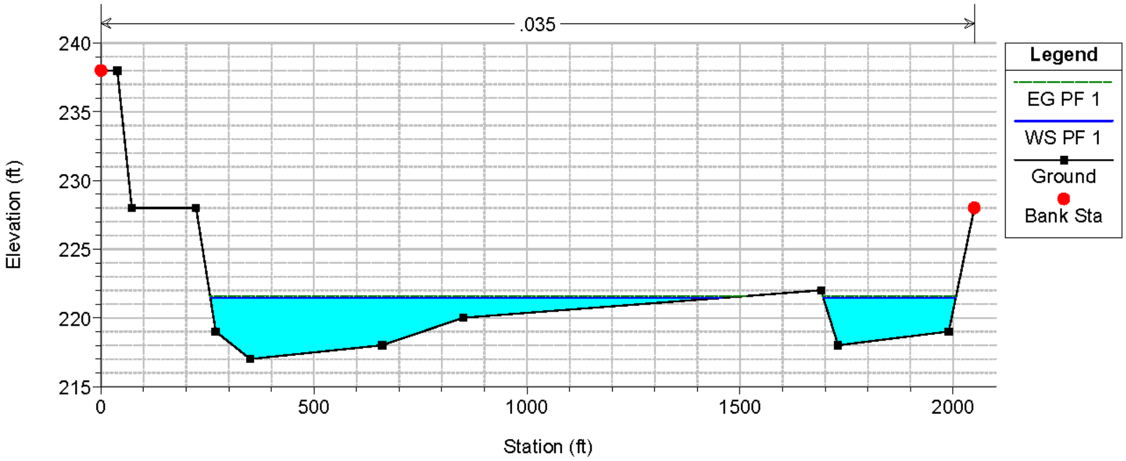
West Overbank River Station 308+40



West Overbank River Station 306+10 - Critical Depth Flow



West Overbank River Station 299+00



Notes

1. Cross section view is looking downstream. The left side of the cross section is the western edge of the Salinas River floodplain. The right side of the cross section is the western edge of the basin structure.

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Preliminary Floodplain Modeling – Greenfield, CA

Salinas River West Overbank Model Cross Sections Near Treatment Plant

Figure

8

This study is preliminary only and is not a certification of flooding levels along the Salinas River or intended to be utilized for accreditation of the levee system.

The banks surrounding the storage and disposal basins were presumed to act as a wall to prevent flow from passing through the structure. The structural stability of the banks is not known. Further study of the competence of the structure banks during peak flow events may be needed during design.

No levee overtopping analyses were performed for this study.

Current Manning's n estimates were developed from aerial photography from Google Earth and from panoramic photos at Elm Avenue from Google Street View. No site visit was performed. Manning's n estimates may be modified based on further investigation.

Appendices

Appendix A

HEC-RAS Modeling Results

Greenfield CA
Preliminary Model Results for Floodplain Analysis

Flow Split
Main Channel = 76,000 cfs
West Overbank = 10,000 cfs
Total = 86,000 cfs

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Greenfield	351	PF 1	86000	216	229.52	225.53	229.82	0.001743	4.18	19663.66	3107.29	0.26
Greenfield	341	PF 1	86000	214	227.56		227.86	0.002225	4.3	19777.98	3989.07	0.29
Greenfield	328	PF 1	86000	213	226.56		226.67	0.000459	1.9	34456.62	5301.05	0.13
Greenfield	324	PF 1	86000	212	226.39	221.17	226.49	0.000467	2.15	35129.16	5492.75	0.13
Greenfield	323	PF 1	86000	212	226.32		226.43	0.000561	2.34	32662.74	4584.01	0.15
West Basin OB	318.1	PF 1	10000	218	226.24		226.26	0.000042	0.89	11203.19	1929.93	0.07
West Basin OB	316.7	PF 1	10000	217	226.23		226.25	0.000052	1.01	9947.07	1664.46	0.07
West Basin OB	314.8	PF 1	10000	218	226.21		226.24	0.00009	1.21	8256.44	1584.66	0.09
West Basin OB	313	PF 1	10000	218	226.19		226.22	0.000097	1.26	7927.57	1512.59	0.1
West Basin OB	312.2	PF 1	10000	223	226		226.18	0.00256	3.4	2938.78	1473.29	0.42
West Basin OB	308.4	PF 1	10000	221	224.77	223.87	225.01	0.003755	3.97	2521.68	1339.36	0.51
West Basin OB	306.1	PF 1	10000	220	222.74	222.74	223.36	0.01734	6.33	1578.7	1308.63	1.02
West Basin OB	302.1	PF 1	10000	217	221.78	219.57	221.86	0.000537	2.14	4668.67	1452.82	0.21
West Basin OB	301	PF 1	10000	217	221.72		221.79	0.000594	2.09	4774.81	1657.83	0.22
West Basin OB	299	PF 1	10000	217	221.44		221.59	0.001866	3.06	3263.93	1510.75	0.37
East Basin SR	322	PF 1	76000	212	226.2		226.39	0.001262	3.48	21824.46	2769.96	0.22
East Basin SR	306	PF 1	76000	210	223.21		223.56	0.002604	4.77	15936.8	2171.61	0.31
East Basin SR	299	PF 1	76000	209	221.3		221.65	0.002867	4.76	16034.36	3001.77	0.32
DS of WOB Return	298	PF 1	86000	209	221.31	217.71	221.51	0.001336	3.69	23663.79	5089.17	0.23
DS of WOB Return	297	PF 1	86000	209	221.18	217.76	221.38	0.001357	3.68	23760.33	5033.98	0.23
DS of WOB Return	296	PF 1	86000	209	221.04		221.24	0.001388	3.68	23858.37	4977.8	0.23
DS of WOB Return	282	PF 1	86000	207	219.61		219.77	0.000814	2.58	27831.56	5880.16	0.17
DS of WOB Return	260	PF 1	86000	205	218.37		218.5	0.000423	1.97	30998.56	4391.38	0.13
DS of WOB Return	195	PF 1	86000	201	215.57		215.68	0.000446	2.01	36251.98	5362.27	0.13
DS of WOB Return	137	PF 1	86000	198	212.08		212.24	0.000827	2.78	27599.09	4918.25	0.18
DS of WOB Return	83	PF 1	86000	195	208.46		208.56	0.000568	2.26	35024.33	5823.05	0.15
DS of WOB Return	30	PF 1	86000	192	204.44		204.65	0.000994	2.83	24986.63	4358.69	0.19
DS of WOB Return	20	PF 1	86000	192	203.46		203.67	0.00095	3	24583.12	4354.8	0.19
DS of WOB Return	10	PF 1	86000	190	202.25		202.55	0.001331	3.54	20549.05	3826.72	0.22
DS of WOB Return	0	PF 1	86000	189	201.14	197.69	201.38	0.001	3.25	22517.29	3839.07	0.2

All Stations are listed in 100 feet increments, 351.00 = 351+00

Flow (cfs) 86,000

	Flow (cfs)	76,000		10,000	Flow (cfs)	
	Main Channel		Levee	West Overbank		
Location	WSE	Sta	Elevation	Sta	WSE	
	229.52	351.00	231			
	227.56	341.00	227			
	226.56	328.00	228			
	226.39	324.00	228			
	226.32	323.00	228			
		Junction		Junction		
U/S Edge of Basins	226.20	322.00	233	318.10	226.24	
			235	316.70	226.23	
			234	314.80	226.21	
			234	313.00	226.19	
			233	312.20	226.00	
	223.21	306.00	231	308.40	224.77	308+40
South Plant P/L			230	306.10	222.74	306+10
			230	302.10	221.78	302+10
			229	301.00	221.72	301+00
North Plant P/L	221.44	299.00	229	299.00	221.44	299+00
		Junction		Junction		
	221.31	298.00	227			
	221.18	297.00	227			
	221.04	296.00	227			
	219.61	282.00	225			
	218.37	260.00	218			
	215.57	195.00	215			
	212.08	137.00	211			
	208.46	83.00	205			