

McKinleyville Community Services District

Wastewater Management Facility Improvements

Initial Study & Proposed Mitigated Negative Declaration

July 2014

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Initial Study & Proposed Mitigated Negative Declaration
for the
**Wastewater Management Facility Improvements
Project**

Prepared for:



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July 2014

Project Ref#: 01059-8411257

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Acronyms and Abbreviations

ACV	Arcata-Eureka Airport
APCD	Air Pollution Control District
APN	Assessor's Parcel Number
BAAQMD	Bay Area Air Quality Management District
BACT	Best Available Control Technology
bgs	below ground surface
BMPs	Best Management Practices
BSB	Biosolids Storage Basin
CAAQS	California Ambient Air Quality Standards
CACO ₃	calcium carbonate
CalEEMod	California Emissions Estimator Model
CALEPA	California Environmental Protection Agency
CAL FIRE	California Department of Forestry and Fire Protection
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CDHS	California Department of Health Services
CEMA	California Emergency Management Agency
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CH ₄	Methane
CMP	Congestion Management Plan
CMU	concrete masonry unit
CNDDb	California Natural Diversity Database
CNPS	California Native Plant Society
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
dB	decibel
dBA	A-Weighted Sound Level
DTSC	Department of Toxic Substances Control
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
ERP	Emergency Response Plan
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FMMP	Farmland Mapping and Monitoring Program
Ft/min	feet per minute
GHGs	Greenhouse Gases
gpd/sf	gallons per day/square foot
GPM	gallons per minute
H ₂ S	hydrogen sulfide
HBMWD	Humboldt Bay Municipal Water District
HDPE	high density polyethylene
HP	horsepower
HMP	Hazard Mitigation Plan
HDPE	high density polyethylene
HWMA	Humboldt Waste Management Authority
L _{dn}	day/night noise level
L _{eq}	equivalent continuous sound pressure level
L _{max}	maximum A-weighted sound
L _{min}	minimum A-weighted sound
LOS	Level of Service
LRA	Local Responsibility Area

McKAP	McKinleyville Area Plan
MCSD	McKinleyville Community Services District
Mg/L	milligrams per liter
MGD	million gallons per day
MMWWF	maximum month wet weather flow
MTBE	methyl-t-butyl ether
N ₂ O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NAVD88	North American Vertical Datum of 1988
NCAB	North Coast Air Basin
NCRWQCB	North Coast Regional Water Quality Control Board
NCUAQMD	North Coast Unified Air Quality Management District
NFPA	National Fire Protection Association
NPDES	National Pollutant Discharge Elimination System
NPSH	net positive suction head
NSR	New Source Review
OERP	Overflow Emergency Response Plan
OSHA	Occupational Safety & Health Administration
PDF	peak day flow
PIF	peak instantaneous flow
PM	Particulate Matter
PPD	pounds per day
PRC	Public Resources Code
PSD	Prevention of Significant Deterioration
psi	pounds per square inch
RAS	return activated sludge
RE	Residential Estates
ROW	right-of-way
RTS	Redwood Transit Service
RWQCB	Regional Water Quality Control Board
SMAQMD	Sacramento Metropolitan Air Quality Management District
SR	State Route
SRA	State Responsibility Area
SWMP	Stormwater Management Program
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WAS	Waste Activated Sludge
WWMF	Wastewater Management Facility

1. Project Information

Project Title	McKinleyville Community Services District (MCSD), Wastewater Management Facility (WWMF) Improvements Project
Lead Agency Name & Address	McKinleyville Community Services District Mailing Address: PO Box 2037 McKinleyville, CA 95519 Physical Address: 1656 Sutter Road McKinleyville, CA 95519
Contact Person	Mr. Gregory Orsini, General Manager Phone number: (707) 839-3251 Email: mcsdgm@mckinleyvillecsd.com
Project Location	The project is located within the unincorporated community of McKinleyville within MCSD's WWMF, in Humboldt County, California. The WWMF is located off Hiller Road between the Pacific Ocean to the west and Highway 101 to the east.
Project Assessor's Parcel Number (APN)	510-271-015
General Plan Land Use Designation	Residential Estates (RE)
Zoning	Public Facilities (PF1/G)
Description of Project	The project includes a new headworks facility; aeration basins; a blower/electrical/maintenance building; two new secondary clarifiers, including return activated sludge/waste activated sludge pumping; and a biosolids storage basin within the existing WWMF footprint.

1.1 CEQA Requirements

This project is subject to the requirements of the California Environmental Quality Act (CEQA). The CEQA Lead Agency is the MCSD. The purpose of this Initial Study is:

- to provide a basis for deciding whether to prepare an Environmental Impact Report, a Mitigated Negative Declaration or a Negative Declaration;
- to disclose potential project environmental impacts;
- to inform the CEQA Lead Agency, responsible agencies, trustee agencies, and the public of the project and potential environmental impacts.

This Initial Study has been prepared to satisfy the requirements of the CEQA, (Public Resources Code (PRC), Div. 13, Sec 21000-21177), and the State CEQA Guidelines (California Code of Regulations, Title 14, Sec 15000-15387).

1.2 Background

The MCSD was created in 1970 and the District's boundary encompasses more than 12,000 acres ranging from North Bank Road in the south to Patrick's Creek in the north. The District is an independent, special district governed by a five member Board of Directors elected by McKinleyville's voters. The District office is located at 1656 Sutter Road, just east of Central Avenue. MCSD provides the community of McKinleyville with water, wastewater, lighting, open space, parks and recreation, and library services. MCSD has over 4,470 active sewer connections.

Kennedy/Jenks Consultants prepared the Preliminary Design Report to set forth the basis of design of improvements for the MCSD WWMF improvements project, which would address the needs for the facility through the year 2030. The District's Wastewater Facilities Plan (Facilities Plan) finalized in January 2012, presented several treatment alternatives and recommended replacing the existing facultative lagoon system with an in-basin extended aeration system. Subsequently, two manufacturers of in-basin extended aeration systems, Bioworks and Parkson, have been chosen as the preferred vendors for the extended aeration system.

The proposed WWMF improvements include a new headworks facility; aeration basins; a blower/electrical/maintenance building; two new secondary clarifiers, including return activated sludge/waste activated sludge (RAS/WAS) pumping; and a biosolids storage basin. These improvements are discussed in more detail below in Section 1.4.

1.3 Project Location and Environmental Setting

The project is located within the unincorporated community of McKinleyville within MCSD's WWMF, in Humboldt County, California. The WWMF is located off Hiller Road between the Pacific Ocean to the west and Highway 101 to the east. The WWMF is within Section 36, Township 7 North, Range 1 West, Humboldt Meridian within the USGS 7.5' Arcata North topographic quadrangle map at approximately 40 feet above sea level to 50 feet above sea level (Figure 1). Primary access to the project site is off Hiller Road.

The WWMF is surrounded by trees and vegetation immediately to the west, east and south. Adjacent land uses include: single family residences to the north; Hiller Park, and Highway 101 to the east; single family residences to the south; and the Mad River, dunes and Pacific Ocean to the west. The Mad River is adjacent to the project site to the west and flows into the Pacific Ocean

approximately 1.4 miles north of the project site. MCSD currently relies on the Mad River as a resource for domestic and fire supply water.

1.4 Project Description

1.4.1 Project Objectives

The objectives of the project are the development of a wastewater management system that addresses ammonia and toxicity of the treated effluent.

1.4.2 Project Design Components

The Preliminary Design Report prepared by Kennedy/Jenks Consultants includes information on the following: the Basis of Design; Flow Schematics; Technical Memorandums (TMs) covering aspects of the design; Preliminary Cost Estimates, Construction Work Sequence, Project Schedule; Equipment Numbering and Equipment List; Specification List; Major Equipment Specifications; proposed equipment cut sheets; and Preliminary Design Drawings, including Design Data, Hydraulic Profile, Site Plan, Mechanical Plans and Sections, and Process and Instrumentation Diagrams. The following project design components information has been excerpted from the Preliminary Design Report and primarily includes aspects of the design, construction work sequence, the project schedule, and other information as appropriate.

Plant Hydraulics, Facility Layout and Effluent Polishing

Plant Hydraulics

A hydraulic profile was developed that shows expected water surface elevations through the plant. Water surface elevations are shown for a peak instantaneous flow (PIF) of 3.77 million gallons per day (MGD) with the estimated maximum water level in the existing chlorine contact basin. The hydraulic profile is used to establish tank wall elevation high enough to contain the peak flow. Two feet of freeboard (distance between water surface and top of wall) is recommended for all water-containing structures.

The estimated maximum water level in the chlorine contact chamber is at elevation 59.75 feet. The top of wall on the existing chlorine contact chamber is at elevation 68.00 feet. The estimated maximum water surface level in the clarifiers is elevation 63.47 feet. The expected top of wall for the clarifiers is elevation 67.75 feet to maintain the top of wall above the surrounding grade.

Conclusion

The proposed treatment system would provide redundancy, such as a standby diesel generator and a standby blower, thereby lessening the impact of an unplanned breakdown. Providing two aeration basins would allow for the conveyance of toxic flow to one aeration basin where it could be contained for an extended period of time with increased aeration, thereby lessening the impact on treatment performance.

Facility Layout

Given the requirements for new and future facilities, site access, site topography, and existing facility layout, a proposed layout for the new facilities was developed. The proposed layout is shown on Figure 2.

The proposed facilities are located in the southern area of existing effluent storage Pond 1A for the following reasons:

- It places the major treatment units in the center area of the property to increase distance from neighbors to minimize noise and odor complaints.
- It minimizes the piping and electrical conduit length requirements.
- It minimizes the distances between existing and new facilities for access.
- The new and future treatment units fit well in the space.

The paved areas would provide all-weather vehicle access to each process unit. The roadways would also serve as underground utility corridors. All roadways would provide adequate turning radii for emergency services (fire trucks) and chemical deliveries. A new roadway would run along the south side of the new aeration basins and around the new blower/electrical/maintenance building, giving good access to the headworks and building. A second roadway would run to the secondary clarifiers and biosolids storage basin. Parking areas would be provided per code requirements.

Effluent Polishing

As shown on Figure 2, the existing treatment Ponds 1B, 2 and 3 and Wetland Ponds 4 and 5 may be used for effluent polishing.

Discharge piping from the existing irrigation pump station would need to be provided to convey final effluent from the chlorine contact basin effluent box to effluent polishing Pond 1B where it would flow to the other ponds and wetlands using the existing piping and control structures. Piping needed to convey the polished effluent from Wetland Pond 5 to the chlorine contact basin effluent box for final discharge is shown on Figure 2.

Headworks – Screening and Grit Removal

Recommendations

Because no primary treatment is provided, removal of relatively small diameter solids is beneficial. Because the inclined spiral screens have proven reliability and can be repaired over a short period of time, it is recommended that one spiral screen with a capacity of 3.8 MGD be provided. The spiral screen should be provided with a screenings washing system. A bypass channel with a manually raked bar screen would be provided for use when the screen is out of service. An emergency overflow channel would be provided in case the water surface upstream of the screens exceeds a predetermined level.

Grit Removal

Because of the expected low grit load, it is recommended that a grit removal system not be provided. This would allow a large capital cost savings without compromising quality of the treated effluent. Space should be provided downstream of screens to allow for a grit removal facility to be constructed in the future if needed.

Flow Distribution

Flow from the headworks would be evenly split to the two aeration basins with the use of cutthroat flumes which would provide sufficient headloss to create good flow distribution at all expected plant flows.

Secondary Treatment Aeration System

Design Criteria

Proposals were developed by Bioworks and Parkson based on the expected influent flows and concentrations and the required effluent quality. Both systems use similar equipment including the use of floating aerator assemblies mounted to floating headers. Each header has a motorized control valve to regulate air to the submerged diffusers. A programmable logic controller is used to automatically actuate the motorized valves to create separate toxic and anoxic zones along the length of the basins. With the separate zones, the aeration system can achieve biological nitrogen removal.

Description of Operations

The extended aeration systems provided by Bioworks and Parkson are complete-mix activated sludge processes using extended retention of biological solids to create a stable and reliable treatment system. Automated control of the air flow distribution to the moving aeration chains varies the dissolved oxygen content by creating a moving action of multiple oxic and anoxic zones. The repeated cycling of environments nitrifies and denitrifies the wastewater without recycle pumping or additional external basins. A programmable logic controller would be used to control the blowers and air header control valves based on continuous dissolved oxygen monitoring.

Alkalinity Addition

Alkalinity of the plant influent may be too low to achieve complete nitrification within the aeration basins. Thus, there would probably be times when supplemental alkalinity is needed to achieve the District's treatment objectives.

Alkalinity needed for nitrification is about 7.2 milligrams per liter (mg/L) calcium carbonate (CaCO_3) for each 1.0 mg/L ammonia nitrogen. However, denitrification in the anoxic zones would result in a gain of 3.0 mg/L of alkalinity for each 1.0 mg/L nitrate nitrogen. Therefore, the net alkalinity needed is 4.2 mg/L.

There are three viable alkaline chemicals based upon cost, availability, and hazards. Those three chemicals are Sodium Hydroxide, Magnesium Hydroxide and Calcium Hydroxide.

Secondary Clarifiers

The preliminary design is based on providing two 50-foot-diameter clarifiers as shown on Figure 2.

Clarifier Hydraulic Loading

Under normal operation, with both clarifiers in service, the PDF to the clarifiers would be limited to about 1.54 MGD each. However, for the PIF (which represents the highest 1-hour flow during the maximum day), about 1.9 MGD would be directed to each existing clarifier.

A possible operating condition would be handling the peak flow conditions with one clarifier out of service. A single clarifier would have an overflow rate of 1,570 gallons per day/square foot (gpd/sf) at peak day flow and an overflow rate of 1,920 gpd/sf at peak instantaneous flow. These are on the upper end of published recommended overflow rates. It is unlikely to occur since under normal conditions two clarifiers would be in operation during the winter when peak flows would occur. It would only occur if there were an unexpected mechanical breakdown that caused a clarifier to be taken out of service during the wet weather period.

Clarifier Solids Loading

The following conditions were considered for the clarifier solids loading: peak day flow (3.08 MGD) with one clarifier out of service plus 1.6 MGD RAS peak flow; and peak day flow (3.08 MGD) plus 1.6 MGD peak RAS flow with two clarifiers in service.

Mixed liquor from the aeration basins is expected to have a solids concentration of 3,000 mg/L. At this concentration, the peak day flow of 3.08 MGD would produce 117,001 pounds per day (ppd) of solids, which equals a solids loading rate of 59 ppd/sf with one clarifier in service. This is higher than the target peak of 50 ppd/sf, but should rarely, if ever, occur since both clarifiers would normally be in service during the winter, when peak day flows take place.

For the peak day flow condition with two clarifiers in service, the loading rate would be 57,500 ppd and 29.8 ppd/sf of clarifier surface area. This represents the normal peak loading condition. Other peaks would only occur if there was an unexpected clarifier breakdown.

Provisions for Future Expansion

The proposed plant layout shows two future clarifiers which would bring the plant's total to four clarifiers. Two future clarifiers would allow for doubling the capacity of the plant; however, the two future clarifiers are not part of this project and are subject to future need, funding, and subsequent CEQA analysis.

Return Activated Sludge Pumps

Installation of two non-clog submersible pumps for each of the two new secondary clarifiers is recommended. The pumps should be fitted with variable frequency drives to allow operation of the RAS pumps at various flow rates. The pumps would be selected to achieve total RAS flows ranging from a minimum of 0.40 MGD (with one pump running) to a maximum of 3.19 MGD (150 percent of maximum month flow with four pumps running). There would be a common RAS line that would convey RAS to the aeration basins with the provision for withdrawal of WAS from the common RAS line. The pumps would be placed at an elevation below that of the water surface of the secondary clarifier to ensure that net positive suction head (NPSH) requirements are met.

The RAS pumps would be located below the bottom of the clarifiers to allow them to be used to drain the clarifiers when the clarifiers are taken out of service.

To provide a method for sludge bulking control, piping should be provided to feed chlorine solution from the existing plant effluent disinfection system into the RAS pump discharge piping.

Sludge Collection Equipment

Hydraulic-type sludge collection equipment is recommended for use in the new secondary clarifier. This would ensure rapid return of settled biomass to the aeration basins. A single sludge collection header should be used in order to maintain adequate velocities within the header to avoid clogging and also provide greater turndown capability for RAS pumping. At a collection header tip speed of 6.0 feet per minute (ft/min), the collection arm would sweep the entire secondary clarifier invert once every 26 minutes. A tip speed of 6.0 ft/min is within the allowable speed range to avoid undue disturbance of the sludge blanket. The 26-minute rotation time is short enough to prevent problems such as denitrification that are associated with long sludge detention times within the secondary clarifier.

Effluent Launderers

Peripheral effluent launderers are recommended for use on the new secondary clarifier to facilitate cleaning of the effluent weirs and to reduce capital cost. Stamford® baffles should be provided to reduce the potential for solids short-circuiting.

Additional Features

Other equipment associated with the new secondary clarifier include a WAS pump, scum removal and pumping.

A WAS pump would draw WAS from the common RAS discharge piping and pump the WAS to the sludge storage basin. The pump would be a rotary lobe type with a variable speed drive to provide the ability to vary the solids wasting rate.

A constant-speed submersible pump would be used to pump scum directly to the sludge storage basin. The scum pump would be located in a sump adjacent to the secondary clarifiers and would receive scum from the clarifiers by gravity.

Description of Operations

The secondary clarifiers and RAS pumps would operate continuously except when they are out of service for maintenance or when flows do not warrant operation of both clarifiers. When the clarifiers are in operation, the sludge collection drive units would operate continuously. The drive units would be provided with an automatic shutdown on overload when torque exceeds 125 percent of the drives' maximum rating.

When a clarifier is put into service, power to the clarifier mechanism would be turned on. As the sludge blanket forms, the RAS pumps would be activated and plant operators would initially set the RAS pumping rate to a given fraction of the influent flow rate. The plant's influent flow meter would then control the pump speeds to maintain the RAS flow rate at the set fraction of influent flow. At minimum plant flows, the lead pump for both clarifiers would operate at low speed, gradually increasing in speed as plant flow increases. Should plant flow exceed the capability of the lead pumps at high speed, the lag pump for both clarifiers would power on and the pumps would operate in parallel, first at low speeds and then gradually at higher speeds as plant flow dictates. A flow meter and totalizer on the common RAS line would allow plant operators to monitor and record RAS rates.

As sludge accumulates in the system, it would be necessary to waste a portion to the sludge storage basin. Wasting would be controlled manually. The wasting rate can be varied by varying the amount of time the WAS pump is run. The balance of RAS and WAS pumping would vary throughout the year and must be routinely observed and adjusted by the operators.

Scum from the secondary clarifiers would drain by gravity into a scum sump. Level controls in the sump would dictate operation of one single-speed submersible scum pump that would pump the accumulated scum to the sludge storage basin.

Biosolids Handling

The existing WWMF has two facultative treatment ponds (Pond 1A and Pond 1B) and two oxidation ponds (Pond 2 and Pond 3). The new extended aeration system would be constructed in Pond 1A and the other three ponds would be repurposed for effluent polishing.

As Pond 1A is removed from service and Ponds 1B, 2 and 3 are used for effluent polishing ponds, the biosolids from the ponds needs to be processed and handled in the short term. Three alternatives for biosolids handling in the short term were analyzed as follows:

Short Term Biosolids Handling Alternatives

This project is in progress and is anticipated to be completed by October, 2014.

1. Contract dredging and dewatering biosolids from Pond 1A followed by off-site disposal.
2. Contract dredging and dewatering biosolids from Ponds 1B, 2 and 3 followed by off-site disposal.
3. Contract dredging biosolids from Ponds 1B, 2 and 3 and transferring the biosolids to a new Biosolids Storage Basin (BSB).

Two alternatives for handling the biosolids (i.e. WAS) that would be produced from the new extended aeration system over the long term were analyzed as follows:

Long Term Biosolids Handling Alternatives

1. Mechanical dewatering of WAS followed by off-site disposal.
2. Storage of WAS in a new BSB followed by periodic contract dredging, dewatering, and off-site disposal.

Dewatering would allow the biosolids to meet the minimum solids content of 16 percent to pass the paint filter test, which is required (by the Environmental Protection Agency (EPA)) for off-site disposal at a landfill. Dewatering would also reduce the volume of biosolids hauled significantly.

Existing Quantity of Biosolids

The four ponds were surveyed for biosolids depth and are currently being sampled for quality. The survey compared the biosolids surface to the floor of the ponds, based on the MCSD WWMF 1982 project drawings. The surveyed depth indicates deeper biosolids at the toe of the side slopes (a depth of 2.75 to 7.75 feet) and relatively shallow biosolids across the pond bottoms (a depth of 0.5 to 1.75 feet). It is assumed that the shallow depth of biosolids across the pond bottoms is due to aerator locations which do not allow the biosolids to settle below them. The estimated volumes of biosolids in the four ponds based on biosolids depths observed during the survey are listed in Table 1-1 below.

Table 1-1 Existing Biosolids Quantity in Ponds

	Estimated Biosolids Quantity, (cubic yards)	Estimated Biosolids Quantity, (dry tons ^a)
Pond 1A	20,378	1,029
Pond 1B	14,686	742
Pond 2	8,183	414
Pond 3	7,789	394
Total	51,036	2,579

Source: Kennedy/Jenks Consultants, 2014.

Note: ^aAssuming the biosolids have an average solids concentration of 8 percent.

Off-Site Disposal of Biosolids

Off-site disposal of biosolids only applies to Alternative Number 1 (land application). Two options for off-site disposal of biosolids were explored including disposal via beneficial use using land application and disposal via landfilling. Brief descriptions of the two options are as follows:

1. Land Application

The closest known land application site is approximately 250 miles from MCSD's facility. It is assumed that a potential land application site may be found within 50 miles of the facility which would accept Class B Biosolids "cake" with a solids concentration in the range of 16 percent to 24 percent. It should be noted that some farms require a minimum number of years of contract and do not provide hauling services. MCSD may be required to haul the biosolids or hire a Contractor to perform this work. It is assumed the MCSD would have to provide a minimum of three months' worth of biosolids storage at the WWMF in the event that a WWMF upsets or land application operational issues, such as bad weather, that could prevent land application.

2. Landfilling

Anderson Landfill, Inc is located 155 miles from MCSD's facility at 18703 Cambridge Rd, Anderson, California. The landfill accepts biosolids from wastewater treatment facilities. The preliminary design report assumed a tipping fee of \$32.60 per wet ton is for biosolids with a minimum solids concentration of 16 percent to meet the paint filter test. It is assumed that the MCSD would haul the biosolids with their own staff and truck. As with land application, it is assumed that the MCSD would have to construct three months' worth of biosolids storage at the WWMF in the event that any landfill operational issues or WWMF upsets.

Plant Utilities

Plant utilities include the tank drain pumping station and the utility water pumping station. The tank drain pumping station would be used for pumping the drainage from the process tanks to the plant headworks. The utility water pumping station would be used to pump utility water (final effluent) to the various plant water demands including process spray nozzles, utility stations, and the chemical feed systems.

Tank Drain Pumping Station

Normally, the tank drain pumping station would be located in close proximity to the deepest tank so the length of the deepest drain piping can be minimized. Since the secondary clarifiers would be drained using their associated RAS pumping stations, the deepest tank to be connected to the tank drain station would be the aeration basins. To eliminate the need for a second pump station, the tank drain pumping station should be designed so that it can also pump supernatant from the biosolids storage basin.

Design Criteria

The tank drain pumping station should drain an aeration basin in a reasonable amount of time while keeping the pumps at a reasonable size. An aeration basin would have a volume of approximately 1.55 million gallons. If a drain time of two days is assumed, the pumping station capacity should be about 550 gallons per minute (gpm). This could be achieved with two pumps with each rated at 275 gpm.

Plant Water Pumping Station

Currently, plant water is supplied from a service connection to McKinleyville's water-distribution system. The proposed plant water system would utilize pumped final effluent thereby conserving potable water. The demand is categorized as either continuous or intermittent. The estimated total continuous demand is 70 gpm and the total demand (intermittent plus continuous) is 150 gpm.

Two plant water pumps would be provided. Each pump would have the capacity to provide the total demand (150 gpm each). If a pump needs to be taken out of service, the remaining pump can serve the total demand. Submersible turbine type pumps with variable speed drives are recommended.

By incorporating a hydropneumatic tank into the plant water system, the pumps can be selected to operate at their maximum efficiency and would not have to run continuously. Thus, power costs would be saved. The two pumps would alternate cycling on and off to maintain suitable delivery pressures.

The pressure range of the plant water system would be maintained between 50 and 85 pounds per square inch (psi). If plant water piping is sized to keep pressure losses below five psi at peak demand, the minimum pressure at the hydropneumatic tank would be 55 psi. Assuming that the maximum pressure at the point of demand is 85 psi, the maximum pressure at the hydropneumatic tank (at minimum demand) would be approximately 85 psi.

A hydropneumatic tank operating in the pressure range of 55 to 85 psi would allow for a tank withdrawal of approximately 26 percent, leaving 14 percent as a reserve for water seal. If two pumps are alternately cycling on and off at a maximum of 12 starts per hour for each pump, the total volume required for the hydropneumatic tank is 360 gallons (a tank three feet in diameter and seven feet long).

Pressure reducing valves would be provided in plant water lines serving demands that require a pressure lower than 85 psi, such as spray water.

Blower/Electrical/Maintenance Building

This new building is approximately 2,250 square feet and would house the aeration blowers, the plant electrical room, a maintenance room and a restroom/shower area. The proposed location for the building is shown on Figure 2. The proposed location is central to the new and existing plant process units thereby minimizing electrical conduit and aeration air piping lengths. The plant electrical room would include the plant motor control center and switchgear.

The building design would use materials and finishes that are standard in the commercial industry. The construction would consist of a concrete floor slab and foundation, concrete masonry unit (CMU) bearing walls, and steel framed roof with metal roofing.

The restroom would be unisex and would include a shower, toilet, sink, lockers, and bench. Facilities located in operational areas would be designed for wheelchair accessibility. The Toilet Room/Shower Room would be sized and the fixtures (shower, sink, and toilet) specified and installed to be handicapped accessible.

The standby generator would be located outside in a weather proof enclosure adjacent to the electrical room to minimize electrical conduit lengths. The standby generator would have a sub-base fuel tank that would provide sufficient fuel storage for 24 hours of continuous operation at full power.

Existing Control Building

The existing Control Building is located on the south side of the site as shown on Figure 2. The building houses the control room and laboratory, disinfection equipment, shop storage area, and restroom. The building would undergo minor renovation including the following:

- Demolition of the existing MCC and control cabinet in lab/control room. Equipment to be salvaged by the Owner would be specified.
- Demolition of existing MCC and PG&E service in garage. Equipment to be salvaged by the Owner would be specified.
- Perform lead and asbestos abatement related to the demolition.
- Installation of new countertops and cabinets in the existing lab space.
- Replace monorail access doors on the chlorine and sulfur dioxide storage rooms. Corrosion resistant doors would be provided.

Interim Treatment

Prior to taking Pond 1A out of service for constructing the extended aeration system improvements, the following steps to provide interim treatment during construction are recommended:

1. Moved three aerators to Pond 1B, one to Pond 2, and the last to Pond 3. Added a sixth aerator to the deep end of Pond 4. Ammonia concentrations in the ponds and effluent will be closely monitored by District staff.
2. If it appears that ammonia concentrations could exceed allowable limits, pH will be adjusted to improve removal efficiency. This will be accomplished by elevating the pH in Ponds 1A, 2 and 3 to a range of 9.5 to 10 by early purchase, or rental of calcium hydroxide slurry totes, mixer, and pumps. A dosage of about 200 mg/L of calcium hydroxide is required to maintain pH between 9.5 to 10. Daily monitoring of pH and ammonia should be provided in the early stages of implementation, and calcium hydroxide dosages adjusted accordingly (would only be necessary if MCSD was unable to maintain compliance).
3. It is expected that Wetland Ponds 4 and 5 would lower the pH range of 9.5 to 10 in the wetland influent to a pH range of 8 to 8.5 in the wetland effluent. If additional buffering is required to keep the pH below 8.5, carbon dioxide (CO₂) could be added to the wetland effluent using a rented 1,000-gallon CO₂ tank. The chemical feed can be manually adjusted based upon daily pH monitoring.

Construction Work Sequence

The construction work sequence generally consists of the following steps:

1. Take Pond 1A out of service by diverting all influent to Pond 1B.
2. Dredge, dewater, and haul off-site existing biosolids from Pond 1A.
3. Construct new treatment facilities and sludge storage basin in Pond 1A area.
4. Use Ponds 1B, 2, and 3 and Wetland Ponds 4 and 5 as effluent polishing ponds and wetlands.

Project Schedule

The schedule shows construction beginning in March 2015 and construction being completed by August 2016.

1.4.1 CEQA Responsible and Trustee Agencies and Endangered Species Consultation Agencies

- California Department of Fish and Wildlife
- North Coast Regional Water Quality Control Board
- United States Fish and Wildlife Service
- North Coast Air Quality Management District
- Humboldt County Local Coastal Development Permit

1.5 Environmental Protection Actions Incorporated into the Project

The following actions are included as part of the project to reduce or avoid potential adverse effects that could result from construction or operation of the project. Additional resource-specific mitigation measures are presented in the following analysis sections. Project and resource-specific mitigation measures are also included in the Mitigation, Monitoring, and Reporting Program prepared for the project (bound separately).

1.5.1 Environmental Protection Action 1 – Implement Air Quality Emission Control Actions during Construction

The project includes the following air quality control actions to reduce construction generated emissions:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) would be watered as necessary during dusty conditions.
- If loose material becomes airborne during transportation, all haul trucks transporting soil, sand, or other loose material off-site would be covered.
- Disturbed roadways would be re-paved as soon as possible following work in the area, as appropriate.
- All visible mud or dirt track-out onto adjacent public roads would be removed using wet power vacuum street sweepers, as necessary. The use of dry power sweeping is prohibited.
- Idling times would be minimized by shutting equipment off when not in use.
- All construction equipment would be maintained and properly tuned in accordance with manufacturer's specifications.

1.5.2 Environmental Protection Action 2 – Procedures Regarding Encountering Human Remains

If human graves or remains are encountered, the MCSD or construction manager would ensure that work would halt in the vicinity and the County Coroner would be notified. At the same time, a qualified archaeologist would be contacted to evaluate the situation. If human remains are of Native American origin, the County Coroner would notify the Native American Heritage Commission (NAHC) within 24 hours of identification, pursuant to PRC 5097.98.

1.5.3 Environmental Protection Action 3 – Erosion Control

The following erosion control actions would be implemented by the construction contractor to prevent soil erosion and sedimentation during construction. Erosion and sediment control actions would be in effect and maintained by the contractor on a year-round basis until all disturbed areas are stabilized.

- Stockpiled material would be covered or watered to eliminate excessive dust, as necessary.
- Fiber rolls or similar products would be utilized in appropriate locations to reduce sediment runoff from disturbed soils, as necessary.
- Storm drain inlets receiving stormwater runoff would be equipped with inlet protection, as necessary.
- A concrete washout area would be designated to clean concrete trucks and tools, as necessary.

1.5.4 Environmental Protection Action 4 – Stormwater Pollution Prevention Plan

The project would disturb more than one acre of ground surface and is therefore subject to National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order No. 2012-0006-DWQ, NPDES No. CAS000002), which requires the MCSD to submit permit registration documents (notice of intent, risk assessment, site maps, SWPPP, annual fee, and certifications) to the SWRCB. The SWPPP would address pollutant sources, non-stormwater discharges resulting from construction dewatering, best management practices, and other requirements specified in the Order. The BMPs would include any measures included in the project's erosion control plans. The SWPPP would also include dust control practices to prevent wind erosion, sediment tracking, and dust generation by construction equipment. A qualified SWPPP practitioner would oversee implementation of the SWPPP, including visual inspections, sampling and analysis (if necessary), and ensuring overall compliance.

1.5.5 Environmental Protection Action 5 – Construction Dewatering Reduction

Excavation and below grade work would be scheduled during summer/fall to coincide with the period of the lowest groundwater levels at the site and the time frame with the least chance for rainfall. *This environmental protection action does not address the handling of biosolids.* If groundwater is encountered, the contractor, in coordination with the MCSD would evaluate options for dewatering management. If dewatering is necessary, one or more of the following management options would be used by the construction contractor to protect water quality:

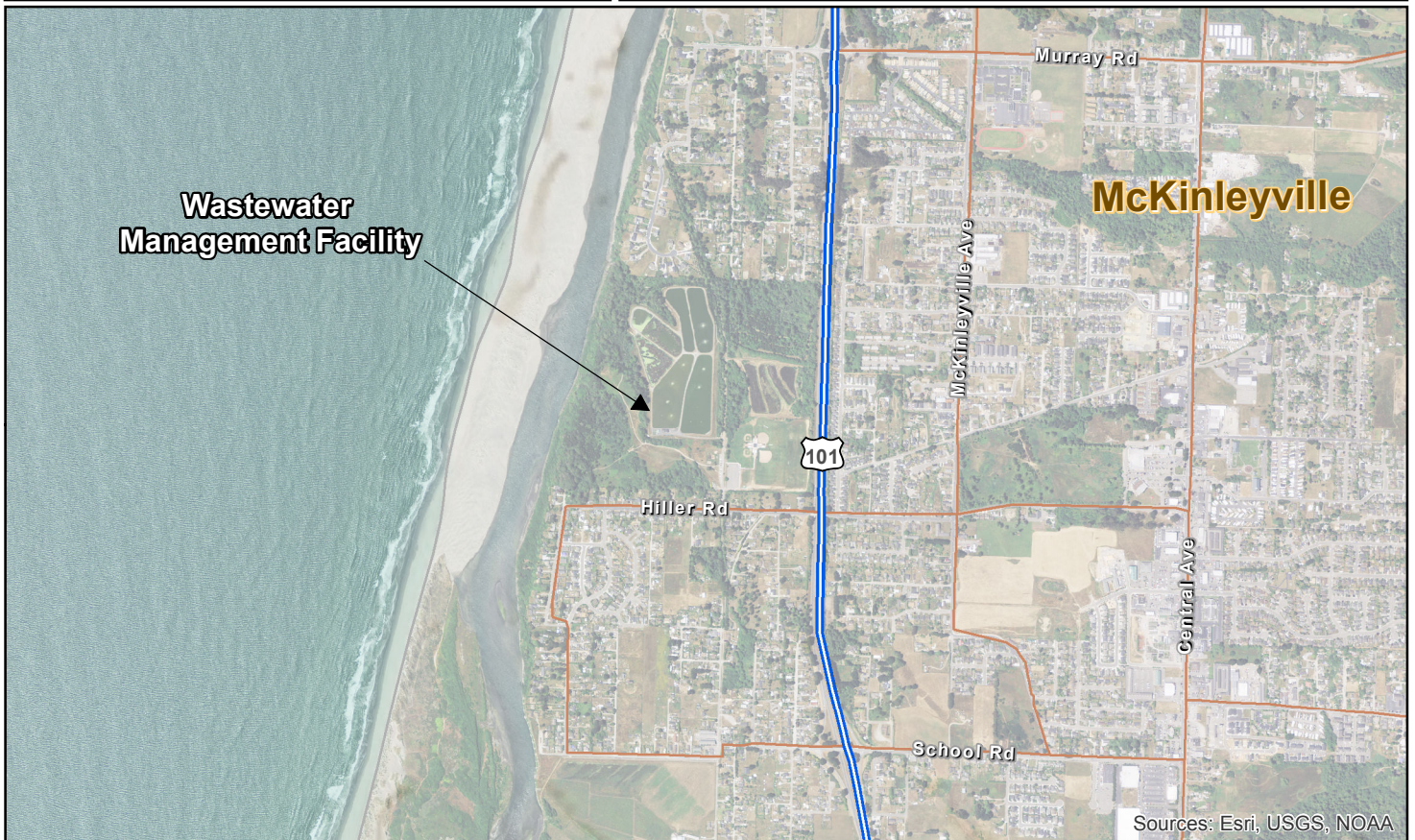
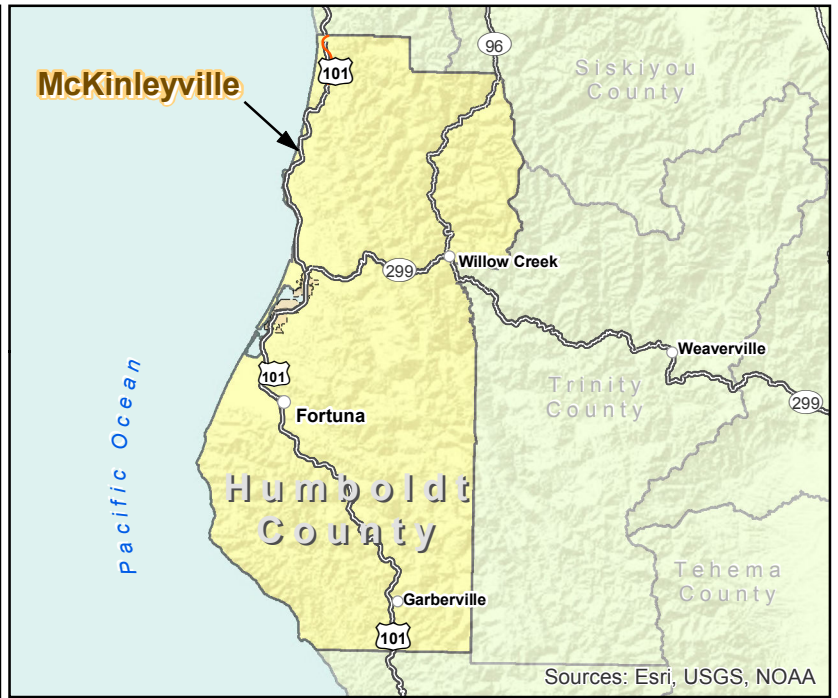
- Reuse the water on-site for dust control, compaction, or irrigation, as appropriate.
- Discharge the water on-site in a grassy or porous area to allow infiltration/evaporation.
- Discharge (by permit) to headworks or storm drain (this option may require a temporary method to filter sediment-laden water prior to discharge).

If discharge to a storm drain (i.e., surface waters) is the only feasible option, the project would comply with SWRCB requirements for construction dewatering. Actions may include characterizing the discharge and receiving waters and developing a BMP Plan including filtering methods, monitoring and reporting requirements, and a description of the pump systems proposed to remove groundwater and maintain a dry work area.

1.5.6 Environmental Protection Action 6 – Noise Reduction Actions

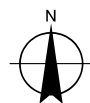
During project construction, the following actions would be incorporated into the project to reduce daytime noise impacts to the maximum extent feasible:

- A preconstruction meeting/conference call would be held among the MCSD, construction manager and the general contractor to confirm that the following noise reduction practices are to be implemented in the appropriate phase of construction.
- Hours of construction would be limited to between 7:00 AM and 6:00 PM, Monday through Friday, and 10:00 AM and 5:00 PM on Saturdays. No construction would be allowed on Sundays, except in an emergency. Specifications/plans would note these hours of construction.
- Semi-stationary equipment (e.g., generators, compressors, etc.) would be located as far as possible from residences near the WWMF improvements or shielded behind a building if feasible.
- Quietest available equipment and electrically-powered equipment would be used, rather than internal combustion engines where feasible.
- Equipment and on-site trucks used for project construction would be equipped with properly functioning noise control devices such as mufflers, shields, and shrouds. All construction equipment would be inspected at periodic intervals to ensure proper maintenance and resulting lower noise levels.
- Impact tools (e.g., jack hammers, pavement breakers, rock drills) used for project construction would be hydraulically or electrically powered wherever possible to avoid noise associated with compressed-air exhaust from pneumatically powered tools.



- Highway
- Major Road
- City Limits
- Counties

1: 72,000 @ 8.5' X 11" (ANSI A)
 0 500 1,000 1,500 2,000 2,500
 Feet
 Map Projection: Lambert Conformal Conic
 Horizontal Datum: North American 1983
 Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

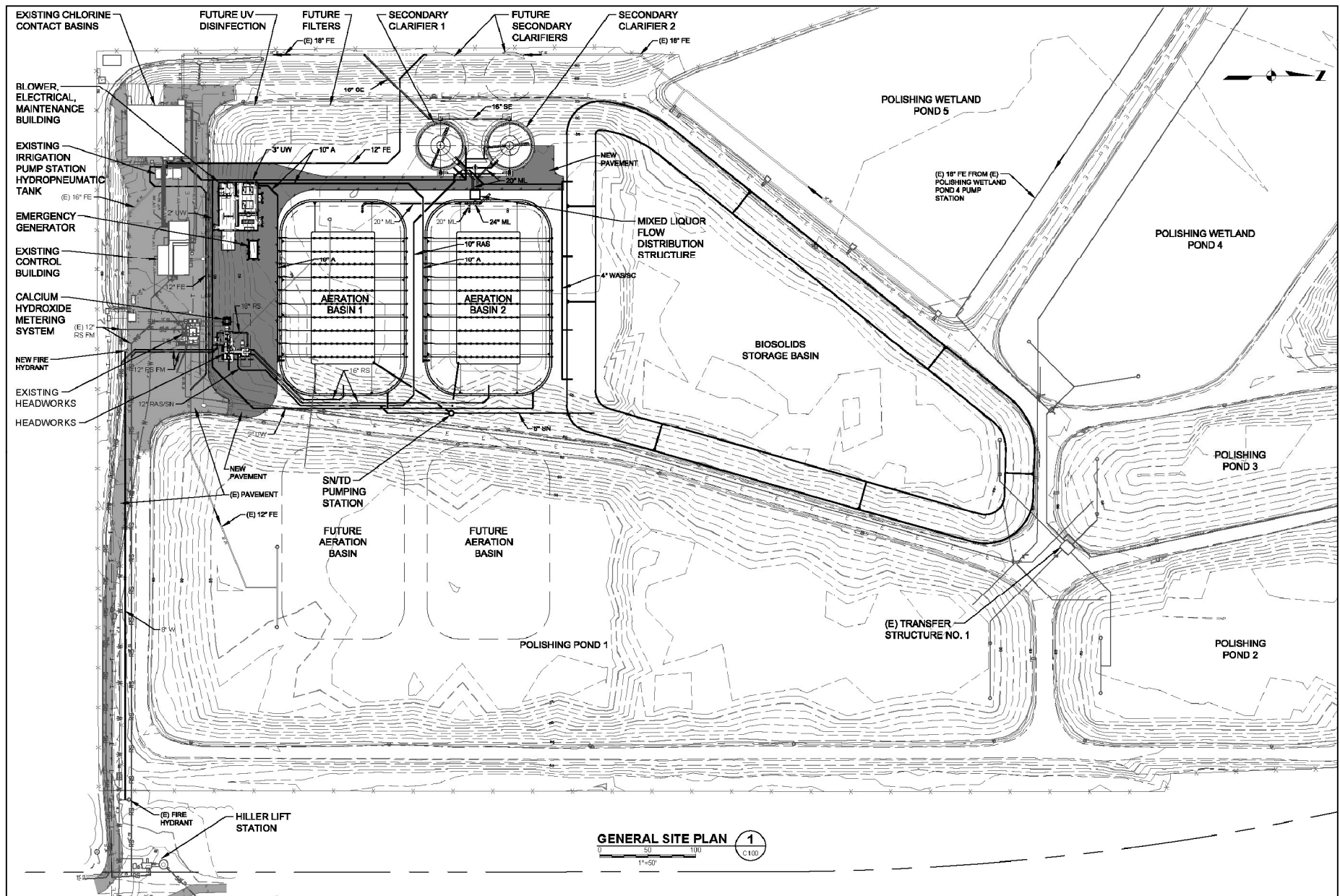


McKinleyville Community Services District
 Wastewater Management Facility Improvements

Job Number 8411257
 Revision 1
 Date 11 Jun 2014

Vicinity Map

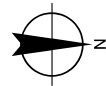
Figure 1



Paper Size 8.5" x 11" (ANSI A)

NOTES:

1. The bearings for this survey are based on zone 1 of the California Coordinate System (NAVD 88).
2. The elevations for this survey are based on measurements to NGS Benchmark "H 1088". Elevation = 139.00'



Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California 1 FIPS 0401 Feet



McKinleyville Community Services District
Wastewater Management Facility Improvements

Job Number	8411257
Revision	A
Date	11 Jun 2014

Preliminary Design
Site Plan

Figure 2

G:\01059 McKinleyville CSD\8411257 MCSD WastewaterMgmtFac-ISMND\08-GIS\Maps\Figures\F2_Site_Plan.mxd

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2. Environmental Factors Potentially Affected

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

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

DETERMINATION

(To be completed by the Lead Agency) 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 would be prepared.
- ☒ I find that although the proposed project could have a significant effect on the environment, there would 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 would be prepared.
- ☐ I find that the proposed 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 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 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.


MCSD Signature

7/16/2014
Date

3. Environmental Analysis

3.1 Aesthetics

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
Would the project:				
a) Have a substantial adverse effect on a scenic vista?			✓	
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?				✓
c) Substantially degrade the existing visual character or quality of the site and its surroundings?			✓	
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?			✓	

3.1.1 Discussion

Views within and adjacent to the project site include single family homes to the north; undeveloped forest land, parkland (Hiller Park), a bicycle/pedestrian path (Hammond Trail), and Highway 101 to the east; single family homes and parkland to the south; and forest land, riparian vegetation, the Mad River, dunes and the Pacific Ocean to the west. Scenic vistas from the project site include the surrounding parkland and forest land, and coastal foothills farther in the distance to the east.

The project site is currently occupied by existing MCSD facilities. It contains an existing control building, chlorine contact basins, pump station, existing headworks, parking lot, and treatment ponds.

a) Adverse Effect on a Scenic Vista – Less than Significant Impact

The project would not have an adverse effect on scenic vistas. The project site is currently developed with the existing WWMF. The heights of the proposed new structures are as follows (feet above existing grade):

- Electrical/Blower/Maintenance Building – approximately 22 feet
- Headworks – approximately 11 feet

- Clarifiers – near existing grade

The project includes facilities that are similar in height, scale, and massing to those currently on the WWMF. The project does not contain any buildings or structures that are higher than the existing buildings at the site. The opportunities for views from vantage points adjacent to the project site would remain similar to existing conditions. Therefore, the impact is less than significant.

b) Damage Scenic Resources within a State Scenic Highway – No Impact

Based on California Scenic Highway Mapping System information, no designated state scenic highways are found adjacent to or within view of the project area (California Department of Transportation 2011). There are no officially designated State Scenic Highways within Humboldt County, although Highway 101 for its entire length in Humboldt County has been identified by the State Scenic Highway Mapping System as eligible for State listing. The project site is not visible from Highway 101 due to the relatively flat ground, and intervening trees and vegetation. No impact has been identified.

c) Degrade Existing Visual Character – Less than Significant Impact

Construction activities associated with the project would result in minor temporary aesthetic impacts that would not substantially alter/degrade the existing visual character of the project area. The project would not substantially degrade the existing visual character, or the visual quality of the project site and its surroundings. The project site is currently developed with the existing WWMF. The project includes facilities that are similar in height, scale, and massing to those currently on the existing WWMF; therefore, the project would not substantially alter the existing visual character of the project site or its surroundings. The impact is less than significant.

d) New Source of Light or Glare – Less than Significant Impact

Construction of the project would occur during daylight hours, and operations would require similar lighting as currently exists at the existing control building. The blower/electrical/maintenance building would have fixtures over the exterior doors. Exterior pole-mounted fixtures would also be provided along the walkways at the proposed secondary clarifiers and aeration basins. Operation of exterior fixtures (switched or photocell control) would be finalized during final design. The lighting system would comply with State of California Energy Code, Title 24. As a result, the project would not create a new source of substantial light or glare. The impact is less than significant.

Considering the nature of construction activities, equipment, and materials, there would be very little, if any, glare resulting from the project. The only potential for project-related glare would be from reflective surfaces (e.g., windshields) on construction equipment as they carry out construction activities. However, these instances of glare would be momentary and passing, depending on sky conditions. The permanent facilities would be constructed of concrete and metal, which would not be highly reflective surfaces causing glare.

As a result, the project would not create a new source of substantial light or glare. The impact from lighting or glare is less than significant.

3.2 Agriculture and Forest Resources

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				✓
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				✓
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?				✓
d) Result in the loss of forest land or conversion of forest land to non-forest use?				✓
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?				✓

3.2.1 Discussion

Maps prepared pursuant to California's Farmland Mapping and Monitoring Program (FMMP) include Humboldt County as an "Area Not Mapped" and, therefore do not categorize the project area as having any type of Important Farmland (California Department of Conservation 2012). According to MCSD's Wastewater Facilities Plan Administrative Draft (SHN 2011), about 2,200 acres of prime agricultural soils are located within the McKinleyville urban development area. The project site and surrounding areas are not under agricultural production.

According to Humboldt County's GIS Portal, neither the project site nor any other parcels in the project area are zoned for agricultural uses or timber production. The closest zoned Agriculture Exclusive (AE) parcel to the project site is south of School Road

approximately 0.7 mile south of the project. There are also no parcels under Williamson Act contract within or adjacent to the project site.

a) Farmland Conversion – No Impact

The project site does not include Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on any maps prepared pursuant to the FMMP. The project would not convert FMMP designated Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to a non-agricultural use; therefore, no impact would occur.

b, c, d) Conflict with Existing Zoning for Agricultural Use or Forest Land or Result in the Loss of Forest Land – No Impact

The project site is zoned Public Facility (PF). There are no parcels in the project site or in the vicinity under Williamson Act contract (California Department of Conservation 2012) or zoned for Timberland Production. The project would not conflict with agricultural or forest land zoning or Williamson Act contracts, and would not result in the loss of forest land; therefore, no impact would occur.

e) Convert Forest Land or Farmland – No Impact

No forest land, timberland, or agricultural land exists at the project site within the WWMF footprint or adjacent parcels. There are trees west and east of the WWMF and within the riparian corridor of the Mad River; however, project activities would not impact any of these trees and/or vegetation. The project would not result in the loss or conversion of forest land, or involve other changes in the existing environment which would result in conversion of farmland to non-agricultural use or conversion of forest land to non-forest use. No impact has been identified.

3.3 Air Quality

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?			✓	
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?			✓	
c) Result in a cumulatively considerable net increase in any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?			✓	
d) Expose sensitive receptors to substantial pollutant concentrations?			✓	
e) Create objectionable odors affecting a substantial number of people?			✓	

3.3.1 Discussion

The project site is located within the North Coast Air Basin (NCAB), which is under the jurisdiction of the North Coast Unified Air Quality Management District (NCUAQMD). The NCAB is comprised of three air districts, the NCUAQMD, the Mendocino County AQMD, and the Northern Sonoma County Air Pollution Control District (APCD). The NCUAQMD includes Del Norte, Humboldt, and Trinity Counties; the Mendocino County AQMD consists of Mendocino County; and the Northern Sonoma County APCD comprises the northern portion of Sonoma County. The NCAB currently meets all federal air quality standards; however, the entire air basin is currently designated as non-attainment for the State 24-hour and annual average particulate matter smaller than 10 microns in size (PM₁₀) standards. The air basin is designated as unclassified for the State annual PM_{2.5} standard – available data are insufficient to support designation as attainment or non-attainment. Both natural and anthropogenic sources of particulate matter (including vehicle emissions, wind generated dust, construction dust, wildfire and human caused wood smoke, and sea salts) in the NCAB have led to the PM₁₀ non-attainment designation.

McKinleyville does not have any ambient air quality monitoring sites within the community. The nearest monitoring stations are in the City of Eureka at I Street and Jacobs, more than 10 miles

south of the project site. In addition to PM₁₀ and PM_{2.5}, the Jacobs Station also monitors for Ozone, Nitrogen Dioxide (NO₂), Carbon Monoxide (CO), and Sulfur Dioxide (SO₂).

Sensitive receptors in the project area include residential neighborhoods to the north, east, and south, as well as recreational, commercial, and educational uses.

a) Conflict with or Obstruct Applicable Air Quality Plan – Less than Significant Impact

To address non-attainment for PM₁₀, the NCUAQMD adopted a Particulate Matter Attainment Plan in 1995. This plan presents available information about the nature and causes of PM₁₀, standard exceedances, and identifies cost-effective control actions to reduce PM₁₀ emissions to levels necessary to meet California Ambient Air Quality Standards (CAAQS). This report is not a document that is required in order for the District to come into attainment for the State standard; however, the District is planning to update the document.

The project would generate a minor amount of particulate emissions over the duration of construction in the form of dust, and vehicle and equipment emissions as a result of earthwork, trenching, clearing, grading, paving, and other construction activities. To reduce potential impacts to air quality, Environmental Protection Action 1 – Implement Air Quality Emission Control Actions during Construction, has been incorporated into the project. While the NCAB is in non-attainment for PM₁₀, the temporary nature of construction activities combined with project implementation of standard dust and CO₂ emission reduction actions during construction would avoid significant impacts.

In the long term, the project would not substantially add to the level of PM₁₀ or other emissions such that it would cause a cumulatively considerable net increase of pollutant emissions in the area. With implementation of Environmental Protection Actions 1 and 3 (Section 1.5) incorporated into the project, the project would not conflict with or obstruct implementation of the NCUAQMD particulate matter attainment plan; therefore, a less than significant impact would occur.

b) Violate Air Quality Standard or Contribute Substantially to Existing or Projected Air Quality Violation – Less than Significant Impact

Under the federal Clean Air Act of 1977, the US Environmental Protection Agency (EPA) is required to identify NAAQS to protect public health and welfare. The EPA has established NAAQS for six criteria air pollutants (Carbon Monoxide, Lead, Nitrogen Dioxide, Ozone, Particle Pollution and Sulfur Dioxide) and the NCAB does not violate these federal pollutant thresholds. Under the California Clean Air Act, the California Air Resources Board (CARB) has adopted more stringent standards for the criteria air pollutants. Though it has adopted a particulate matter attainment plan, the NCUAQMD has not established specific thresholds of significance for criteria pollutants. As discussed above, the NCAB is currently designated as a State non-attainment area for suspended particulate matter (PM₁₀), but does not violate other federal, State, or local air quality standards (CARB 2013). In the NCAB, most particulate matter is caused by vehicle emissions, wind generated dust, construction dust, wildfire and human caused wood smoke, and sea salts. Health effects from particulate matter include reduced lung function, aggravation of respiratory and cardiovascular diseases, increases in mortality rate, and reduced lung function and growth in children.

The NCUAQMD has not formally adopted significance thresholds, but rather utilizes the Best Available Control Technology (BACT) emission rates for stationary sources as defined and listed in the NCUAQMD Rule and Regulations, Rule 110 - New Source Review (NSR) And Prevention of Significant Deterioration (PSD), Section 5.1 – BACT. An applicant shall apply BACT to any new emissions unit or modification of an existing emissions unit, if the change would result in an increase in the potential to emit from the new unit or modification of existing equipment. BACT shall be applied to each new unit or modification only for the pollutant(s) emitted in excess of the threshold(s) listed in Table 3.3-1.

Table 3.3-1 NCUAQMD Significance Thresholds

Pollutant	Significance Thresholds	
	Daily (pounds per day)	Annual (tons per year)
Carbon monoxide	500.0	100
Fluorides	15.0	3.0
Hydrogen sulfide	50.0	10.0
Lead	3.2	0.6
Nitrogen oxides	50.0	40.0
Particulate matter (PM ₁₀)	80.0	15.0
Particulate matter (PM _{2.5})	50.0	10.0
Reactive organic compounds	50.0	40.0
Reduced sulfur compounds	50.0	10.0
Sulfur oxides	80.0	40.0
Sulfuric acid mist	35.0	7.0
Total reduced sulfur compounds	50.0	10.0

Source: NCUAQMD, Rule 110 New Source Review and Prevention of Significant Deterioration, 2010.

Project construction activities would cause the release of a limited amount of PM₁₀ emissions related to fugitive dust, exhaust emissions from on-road haul trucks, worker commute vehicles, and off-road heavy duty construction equipment; however, because of the relatively small footprint combined with the limited duration of proposed construction at any given time, and with air pollution prevention BMPs incorporated into the project (see Section 1.5, Environmental Protection Actions 1 and 3) construction of the project would not cause a violation of air quality standards or contribute substantially to an existing or projected air quality violation.

The California Emissions Estimator Model (CalEEMod) was used to estimate emissions. CalEEMod was developed in cooperation with air districts throughout the State, and is a relatively new statewide land use project emissions model designed as a uniform platform to quantify potential criteria pollutant and greenhouse gas (GHG) emissions associated with construction and operation from a variety of land uses.

The primary source of PM attributable to the project is the imported structural fill. The amount of imported structural fill for the project is estimated at 42,600 cubic yards. Assuming an import volume of approximately 42,600 cubic yards of structural fill, which would equate to approximately 2,130 truckloads (20 CY trucks at eight trips per day) between April, 2015 and December, 2015, emissions from construction of the project are estimated at 1.2 tons per year (unmitigated) or 0.69 tons per year (mitigated). This is substantially less than the 15.0 tons per year threshold as shown in Table 3.3-1. Emissions from the other pollutants (ROG, NO_x, CO, SO₂ and PM_{2.5}) are all less than 1.0 tons per year. Reference Appendix B for the CalEEMod emissions estimates.

Long-term operation of the project would be similar to existing conditions and would not result in a substantial increase of PM in the project area. MCSD would have to get written authorization in the form of an Authority to Construct Permit for construction of the project from the Air Pollution Control Officer of the NCUAQMD. MCSD would then have to get written authorization from the Air Pollution Control Officer in the form of a Permit to Operate prior to operation. Additionally, MCSD would adhere to all applicable local, State and federal rules and regulations. Obtaining the necessary permits and adherence to applicable rules and regulations would result in a less than significant impact.

c) Result in Cumulatively Considerable Net Increase of Any Criteria Pollutant for which the Region is in Non-Attainment – Less than Significant Impact

As described above, the NCAB is in non-attainment for the criteria air pollutant PM₁₀; however, as discussed above, with incorporation of Environmental Protection Action 1, project construction would cause only minor and short-term production of PM₁₀ and would not significantly increase the background levels. Due to the limited amount of equipment capable of producing PM emissions, project operation would result in a small amount of PM₁₀ emissions; therefore, the project would result in a less than significant cumulative impact to air quality from criteria air pollutant and precursor emissions.

d) Expose Sensitive Receptors to Substantial Pollutant Concentrations – Less than Significant Impact

Construction of the project would create temporary emissions of toxic air contaminants, primarily as a component of diesel emissions. Due to the variable nature of construction activity, the generation of toxic air contaminant emissions in most cases would be temporary, particularly considering the short amount of time such equipment is typically within an influential distance of sensitive receptors. Sensitive receptors in the project area include residences, churches, schools, parks, and areas adjacent to roadways where the general public would have access. Concentrations of mobile-source diesel PM emissions are typically reduced by 70 percent at a distance of approximately 500 feet (BAAQMD 2012). The closest residences to the southern half of Pond 1A, where most of the construction would take place, are approximately 725 feet. In addition, current models and methodologies for conducting health risk assessments are associated with longer-term exposure periods of 9, 40, and 70 years, which do not correlate well with the temporary and variable nature of construction activities associated with this project.

Project site work would commence in April, 2015 and continue through January, 2016. Construction of the blower/electrical/maintenance building, headworks, secondary clarifiers, and other wastewater facilities would commence in May, 2015 and continue through March, 2016. Construction would be between the hours of 7:00 AM and 6:00 PM, Monday through Friday, and 10:00 AM and 5:00 PM on Saturdays. No construction would be allowed on Sundays, except in an emergency. As discussed above, the project would result in short-term construction-related air emissions over the construction period. Additionally, implementation of Environmental Protection Actions, described in Section 1.5, and adherence to applicable codes and regulations, would keep diesel PM exhaust emissions (and other emissions) at lower levels. As these emissions are temporary in nature, health risks from project construction are not anticipated. Construction impacts are less than significant.

Project operation would not expose sensitive receptors to substantial pollutant concentrations as the WWMF improvements do not have the capability of producing substantial pollutants (toxic air pollutants such as diesel PM, lead, Benzene, Hex Chrome, etc.) in close proximity to sensitive receptors. The top three contributors of the potential cancer risk come primarily from motor vehicles (diesel PM, butadiene, and benzene [CARB]). The project would use diesel in small amounts for the standby generator which is estimated to run for one hour per week and use approximately 30 gallons of diesel per hour. Operational impacts are anticipated to be less than significant.

e) Create Objectionable Odors – Less than Significant Impact

During construction the various diesel-powered vehicles and equipment could create localized odors. Additionally, some materials used in construction or substrates encountered in sub-surface construction may create objectionable localized odors. These odors would be temporary and not likely to be noticeable for extended periods of time beyond the construction zone due to atmospheric dissipation. The project's construction impact would be less than significant.

If a project has the potential to cause an odor or other nuisance problem which could impact a considerable number of people, then it may be considered significant. A project may emit a pollutant in concentrations that would not otherwise be significant except as a nuisance, for example hydrogen sulfide (H₂S). Odor impacts on residential areas and other sensitive receptors warrant the closest scrutiny, but consideration shall also be given to other land uses where people may congregate, such as recreational facilities like Hiller Park, work sites and commercial areas. According to MCSD's Sanitary Sewer Management Plan (Freshwater Environmental Services 2011), MCSD receives very few odor complaints per year. The complaints are most often in the area of treatment lagoons in Hiller Park due to low water levels. The treatment lagoons in Hiller Park are not a part of this project. MCSD has no official odor control program in place; however, MCSD has odor easements with all parcels in the vicinity of the WWMF.

The WWMF improvements including a new headworks facility; aeration basins; a blower/electrical/maintenance building; two new secondary clarifiers, including RAS/WAS pumping; and biosolids storage basin would not substantially increase odors over existing conditions and would not affect a substantial number of people. Therefore, odor impacts under the project would be less than significant.

3.4 Biological Resources

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and 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, 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?				✓

3.4.1 Discussion

Existing Setting

The environmental setting within McKinleyville is characterized by the presence of the Mad River and Pacific Ocean in conjunction with residential and commercial development. Natural resources are primarily confined to the Mad River and surrounding riparian corridor, along with the coastal areas to the west and timberlands to the east. McKinleyville is predominantly affected by the mild maritime climate, and altered by current and historical development. Influence from these factors is evident in the variety of habitat types found in the vicinity, which include freshwater and estuarine wetlands, coastal prairie, coastal strand, scrub-shrub, and North Coast coniferous forest.

The project site is currently developed and used as the WWMF. No natural habitats remain on the project site. No sensitive species or sensitive natural communities are known to occur within the project footprint.

Due to the developed nature of the project site, the project site is not likely to be used as a wildlife corridor. The project site is not included in any State, regional or local habitat conservation plan.

The close proximity of the WWMF to the Mad River and Pacific Ocean attracts a wide variety of bird species. Ponds 4 and 5 at the WWMF are used as non-jurisdictional wetlands. These ponds provide a low quality aquatic habitat for bird species.

a, b) Impacts to Special-Status Species, Riparian or Sensitive Natural Community – Less than Significant Impact

Based on guidelines established by the California Department of Fish and Wildlife (CDFW) and U.S. Fish and Wildlife Service (USFWS), a project could be considered to have a significant adverse impact on biological resources if it would result in substantial disruption to, or destruction of, any special-status species, its habitat, or breeding grounds. Special-status species are those that are candidates, proposed, or listed as threatened or endangered by the USFWS or the CDFW, plants that are considered sensitive species by the California Native Plant Society (CNPS), or wildlife that are considered species of special concern by the CDFW. A project would also be considered to have a significant impact if it would result in a substantial loss of important plant or animal species; would cause a change in species composition, abundance, or diversity beyond that of normal variability; would result in the direct or indirect measurable degradation of sensitive habitats; or would result in loss of a significant plant community.

The project site, where most of the facilities are proposed, is currently developed as the southern half of Pond 1A of the WWMF. No natural habitats remain on the project site (GHD site visit June 2014). A California Natural Diversity Database (CNDDB) and CNPS Inventory of Rare and Endangered Vascular Plants records search was conducted for the project area. A list of federal endangered, threatened and candidate species for the Arcata North USGS quadrangle was reviewed from the USFWS Arcata Field Office in June, 2014. These queries reported a number of special-status species with potential to occur in the Arcata North quadrangle and adjacent quadrangles (Table 3.4-1); however, there are no special-status species with the likelihood of occurrence within the WWMF.

Table 3.4-1 Sensitive Species with Potential to Occur within the Project Area

Scientific Name	Common Name	Federal/State CNPS status	General Habitat	Likelihood of Occurrence
Amphibians				
<i>Ascaphus truei</i>	Pacific tailed frog	None	Aquatic Klamath/North coast flowing waters Lower montane coniferous forest North coast coniferous forest Redwood Riparian forest	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
<i>Plethodon elongatus</i>	Del Norte salamander	None	Oldgrowth	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
<i>Rana aurora</i>	northern red-legged frog	None	Klamath/North coast flowing waters Riparian forest Riparian woodland	Moderate Potential. Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable.
<i>Rana boylei</i>	foothill yellow-legged frog	None	Aquatic Chaparral Cismontane woodland Coastal scrub Klamath/North coast flowing waters Lower montane coniferous forest Meadow & seep Riparian forest Riparian woodland Sacramento/San Joaquin flowing waters	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
<i>Rhyacotriton variegatus</i>	southern torrent salamander	None	Lower montane coniferous forest Oldgrowth Redwood Riparian forest	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
Birds				
<i>Accipiter cooperii</i>	Cooper's hawk	None	Cismontane woodland Riparian forest Riparian woodland Upper montane coniferous forest	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.

Ardea alba	great egret	None	Brackish marsh Estuary Freshwater marsh Marsh & swamp Riparian forest Wetland	Moderate Potential. Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable.
Ardea herodias	great blue heron	None	Brackish marsh Estuary Freshwater marsh Marsh & swamp Riparian forest Wetland	Moderate Potential. Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable.
Brachyramphus marmoratus	marbled murrelet	FT	Oldgrowth	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
Cerorhinca monocerata	rhinoceros auklet	None	Protected deepwater coastal communities	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
Charadrius alexandrinus nivosus	western snowy plover	FT	Great Basin standing waters Sand shore Wetland	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
Coccyzus americanus	Western yellow-billed cuckoo	PT	Open woodlands with clearings and a dense shrub layer, often found in woodlands near streams, rivers or lakes	Moderate Potential. Some of the habitat components meeting the species requirements are present.
Egretta thula	snowy egret	None	Marsh & swamp Meadow & seep Riparian forest Riparian woodland Wetland	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
Fratercula cirrhata	tufted puffin	None		No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
Haliaeetus leucocephalus	bald eagle	FD/SE	Lower montane coniferous forest Oldgrowth	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.

Nycticorax nycticorax	black-crowned night heron	None	Marsh & swamp Riparian forest Riparian woodland Wetland	Moderate Potential. Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable.
Oceanodroma furcata	fork-tailed storm-petrel	None	Protected deepwater coastal communities	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
Pandion haliaetus	osprey	None	Riparian forest	Moderate Potential. Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable.
Phalacrocorax auritus	double-crested cormorant	None	Riparian forest Riparian scrub Riparian woodland	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
Phoebastria albatrus	short-tailed albatross	FE	Protected deepwater coastal communities	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
Rallus longirostris obsoletus	California clapper rail	FE/SE	Brackish marsh Marsh & swamp Salt marsh Wetland	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
Riparia riparia	bank swallow	None/ST	Riparian scrub Riparian woodland	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
Strix occidentalis caurina	northern spotted owl	FT	Lower montane coniferous forest Oldgrowth	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
Fish				
Acipenser medirostris	green sturgeon	FT	Aquatic Klamath/North coast flowing waters Sacramento/San Joaquin flowing waters	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
Eucyclogobius newberryi	tidewater goby	FE	Aquatic Klamath/North coast flowing waters Sacramento/San Joaquin flowing waters South coast flowing	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.

			waters	
<i>Oncorhynchus clarkii</i> clarkii	coast cutthroat trout	None	Aquatic Klamath/North coast flowing waters	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
<i>Oncorhynchus kisutch</i>	coho salmon - southern Oregon / northern California ESU	FT/ST	Aquatic Klamath/North coast flowing waters Sacramento/San Joaquin flowing waters	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
<i>Oncorhynchus mykiss</i> irideus	summer-run steelhead trout	None	Aquatic Klamath/North coast flowing waters Sacramento/San Joaquin flowing waters	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
<i>Oncorhynchus</i> tshawytscha	CA coastal chinook salmon	FT	Aquatic Klamath/North coast flowing waters	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
<i>Spirinchus thaleichthys</i>	longfin smelt	FC/ST	Aquatic Estuary	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
<i>Thaleichthys pacificus</i>	eulachon	FT	Aquatic Klamath/North coast flowing waters	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
Mammals				
<i>Arborimus albipes</i>	white-footed vole	None	North coast coniferous forest Redwood Riparian forest	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
<i>Arborimus pomo</i>	Sonoma tree vole	None	North coast coniferous forest Oldgrowth Redwood	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
<i>Martes pennanti</i>	fisher - West Coast DPS	FC/SC	North coast coniferous forest Oldgrowth Riparian forest	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
<i>Myotis evotis</i>	long-eared myotis	None		No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.

Reptiles				
Emys marmorata	western pond turtle	None	Aquatic Artificial flowing waters Klamath/North coast flowing waters Klamath/North coast standing waters Marsh & swamp Sacramento/San Joaquin flowing waters Sacramento/San Joaquin standing waters South coast flowing waters South coast standing waters Wetland	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
Sensitive Plant Communities				
Northern Coastal Salt Marsh	Northern Coastal Salt Marsh	None	Marsh & swamp Wetland	No Potential. This habitat type is not present on and adjacent to the project site.
Northern Foredune Grassland	Northern Foredune Grassland	None	Coastal dunes	No Potential. This habitat type is not present on and adjacent to the project site.
Insects				
Cicindela hirticollis grvida	sandy beach tiger beetle	None	Coastal dunes	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
Plants				
Abronia umbellata var. breviflora	pink sand-verbena	1B.1	Coastal dunes	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
Astragalus pycnostachyus var. pycnostachyus	coastal marsh milk-vetch	1B.2	Coastal dunes Coastal scrub Marsh & swamp Wetland	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
Cardamine angulata	seaside bittercress	2B.1	Lower montane coniferous forest North coast coniferous forest Wetland	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
Carex arcta	northern clustered sedge	2B.2	Bog & fen North coast coniferous forest Wetland	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
Carex leptalea	bristle-stalked sedge	2B.2	Bog & fen Freshwater marsh Marsh & swamp Meadow & seep Wetland	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.

Carex lyngbyei	Lyngbye's sedge	2B.2	Marsh & swamp Wetland	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
Carex praticola	northern meadow sedge	2B.2	Meadow & seep Wetland	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
Castilleja ambigua var. humboldtensis	Humboldt Bay owl's-clover	1B.2	Marsh & swamp Salt marsh Wetland	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
Castilleja litoralis	Oregon coast paintbrush	2B.2	Coastal bluff scrub Coastal dunes Coastal scrub	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
Chloropyron maritimum ssp. palustre	Point Reyes salty bird's-beak	1B.2	Marsh & swamp Salt marsh Wetland	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
Coptis laciniata	Oregon goldthread	2B.2	Meadow & seep North coast coniferous forest Wetland	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
Erysimum menziesii	Menzies' wallflower	FE/SE/1B.1	Coastal dunes	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
Erythronium oregonum	giant fawn lily	2B.2	Cismontane woodland Meadow & seep Ultramafic	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
Erythronium revolutum	coast fawn lily	2B.2	Bog & fen Broadleaved upland forest North coast coniferous forest Wetland	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
Fissidens pauperculus	minute pocket moss	1B.2	North coast coniferous forest Redwood	Moderate Potential. Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable.
Gilia capitata ssp. pacifica	Pacific gilia	1B.2	Chaparral Coastal bluff scrub Coastal prairie Valley & foothill grassland	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.

<i>Gilia millefoliata</i>	dark-eyed gilia	1B.2	Coastal dunes	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
<i>Hesperervax sparsiflora</i> var. <i>brevifolia</i>	short-leaved evax	1B.2	Coastal bluff scrub Coastal dunes	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
<i>Iliamna latibracteata</i>	California globe mallow	1B.2	Chaparral Lower montane coniferous forest North coast coniferous forest Riparian scrub	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
<i>Lathyrus japonicus</i>	seaside pea	2B.1	Coastal dunes	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
<i>Lathyrus palustris</i>	marsh pea	2B.2	Bog & fen Coastal prairie Coastal scrub Lower montane coniferous forest Marsh & swamp North coast coniferous forest Wetland	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
<i>Layia carnosa</i>	beach layia	FE/SE/1B.1	Coastal dunes Coastal scrub	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
<i>Lilium occidentale</i>	western lily	FE/SE/1B.1	Bog & fen Coastal bluff scrub Coastal prairie Coastal scrub Freshwater marsh Marsh & swamp North coast coniferous forest Wetland	High Potential. All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable.
<i>Lycopodium clavatum</i>	running-pine	4.1	Marsh & swamp North coast coniferous forest Wetland	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
<i>Mitellastrum caulescens</i>	leafy-stemmed mitrewort	4.2	Broadleaved upland forest Lower montane coniferous forest Meadow & seep North coast coniferous forest	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
<i>Monotropa uniflora</i>	ghost-pipe	2B.2	Broadleaved upland forest North coast coniferous forest	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
<i>Montia howellii</i>	Howell's montia	2B.2	Meadow & seep North coast coniferous forest Vernal pool Wetland	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.

<i>Oenothera wolfii</i>	Wolf's evening-primrose	1B.1	Coastal bluff scrub Coastal dunes Coastal prairie	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
<i>Packera bolanderi</i> var. <i>bolanderi</i>	seacoast ragwort	2B.2	Coastal scrub North coast coniferous forest	Moderate Potential. Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable.
<i>Piperia candida</i>	white-flowered rein orchid	1B.2	Broadleaved upland forest Lower montane coniferous forest North coast coniferous forest Ultramafic	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
<i>Sidalcea malachroides</i>	maple-leaved checkerbloom	4.2	Broadleaved upland forest Coastal prairie Coastal scrub North coast coniferous forest	Moderate Potential. Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable.
<i>Sidalcea malviflora</i> ssp. <i>patula</i>	Siskiyou checkerbloom	1B.2	Broadleaved upland forest Coastal prairie	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
<i>Sidalcea oregana</i> ssp. <i>eximia</i>	coast sidalcea	1B.2	Lower montane coniferous forest Meadow & seep North coast coniferous forest Wetland	Moderate Potential. Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable.
<i>Spergularia canadensis</i> var. <i>occidentalis</i>	western sand-spurrey	2B.1	Marsh & swamp Wetland	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
<i>Trichodon cylindricus</i>	cylindrical trichodon	2B.2	Broadleaved upland forest Upper montane coniferous forest	Moderate Potential. Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable.
<i>Usnea longissima</i>	Methuselah's beard lichen	4.2	Broadleaved upland forest North coast coniferous forest Oldgrowth Redwood	High Potential. All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable.

Viola palustris	alpine marsh violet	2B.2	Bog & fen Coastal scrub Wetland	No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements.
<p>CNDDDB access June 10, 2014. Assessment area consists of USGS 7.5' quadrangles: Arcata North, Arcata South, Eureka, Tyee City, Korbel, Blue Lake, Panther Creek, Crannell.</p>				
Key to Ranking Status				
FEDERAL--U.S. Fish and Wildlife Service (USFWS)				
Federal Endangered (FE); Federal Threatened (FT); Federal Proposed (FP, FPE, FPT); Federal Candidate (FC), Federal Species of Concern (FSC), Federal Delisted (FD);				
STATE--California Department of Fish and Wildlife (CDFW)				
State Endangered (SE); State Threatened (ST); Fully Protected (FP); State Rare (SR); State Species of Special Concern (SSC)				
CSC - CDFW Species of Special Concern				
SLC - Species of Local Concern				
CFP - California Fully Protected Species				
California Native Plant Society (CNPS) Rare Plant Ranks				
1A- Presumed Extirpated in California and either Rare or extinct elsewhere				
1B - Rare, Threatened, or Endangered in California and elsewhere				
2 - Rare, Threatened or Endangered in California, but more common elsewhere				
2A- Plants Presumed Extirpated in California, but more common elsewhere				
2B- Plants Rare, Threatened, or Endangered in California, but more common elsewhere				
3 - Review List (more information needed)				
4 - Watch List (limited distribution in California)				
Threat Ranks:				
_0.1 Seriously threatened in California				
_0.2 Moderately threatened in California				
_0.3 Not very threatened in California				

Given the developed nature of the project site, special-status plant species and/or sensitive plant communities are highly unlikely to occur within the project site and were not encountered during a site visit on June 9, 2014. The close proximity of the WWMF to the Mad River and Pacific Ocean attracts a wide variety of bird species. Wetland Ponds 4 and 5 provide a low quality aquatic habitat for these birds; however, current daily site activities do not disrupt these bird species. The project would involve construction in the southern half of Pond 1A, which like existing conditions, would have no impact on bird species. Birds are not anticipated to be affected during construction. Therefore, given the short-term duration of the disturbance, a less than- significant impact would occur.

c) Wetlands – No Impact

The project would not have a direct effect on federally protected wetlands or waters of the United States as defined by Section 404 of the Clean Water Act (including, but not limited to, swamps, marshes, bogs, vernal pool habitat, etc.) through direct removal, filling, hydrological interruption, or other means. The project site contains ponds 4 and 5 which are currently wetlands, and the project would use Ponds 1B, 2, 3, 4, and 5 as effluent polishing ponds and wetlands. Wastewater treatment systems are exempt from Section 404 of the Clean Water Act. The project would not have an adverse effect on federally or State protected wetlands as defined by Section 404 of the Clean Water Act. No impact has been identified.

d) Movement of Fish or Wildlife Species – Less than Significant Impact

Implementation of the project would not interfere 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. Numerous species of birds use the ponds and surrounding areas occasionally on the west and east side of the project site as a resting site, including migratory birds. However, the WWMF is not used as a wildlife movement corridor or nursery site. Nearby construction would disrupt bird species using these areas; however, impacts would be temporary, and due to the other available nearby habitats, it is anticipated that birds would temporarily relocate during construction. There would be no permanent above ground barriers to movement associated with the project, and construction disturbance would be limited to a relatively small area. A less than significant impact would occur.

e) Conflict with Local Policies or Ordinances – No Impact

The project is within the existing footprint of the WWMF, does not conflict with any local policies or ordinances protecting biological resources, and is consistent with applicable policies related to biological resources in the Humboldt County General Plan and McKinleyville Area Plan (McKAP); therefore, no impact would occur.

f) Habitat Conservation Plan – No Impact

There are no adopted Habitat Conservation Plans, Natural Community Conservation Plans, or other approved conservation plans with which the project would conflict. No impact would occur.

3.5 Cultural Resources

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?		✓		
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?		✓		
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?			✓	
d) Disturb any human remains, including those interred outside of formal cemeteries?			✓	

3.5.1 Discussion

The project area has a long history of human use associated with the Mad River including Native American and later with European settlers beginning around 1850. The project area is within the ethnographic territory of the Wiyot and the general area has high potential for archaeological sites.

A Cultural Resources Investigation was not prepared for the proposed project because all of the wastewater facility improvements are within previously developed areas of the WWMF, and primarily within the footprint of Pond 1A.

a, b) Historical or Archaeological Resources – Less than Significant with Mitigation

Based on the fact that the project is entirely within the existing boundaries of the WWMF, there are no known historic or archaeological resources on the project site. Although the project would not result in construction of any area not previously developed, there may be cultural artifacts on or below the surface that could be disturbed by project activities. If previously unidentified archaeological or historic resources are discovered during construction of the project, impacts to such resources could be significant if not treated properly. Background research indicates that the project area lies within traditional territory of the Wiyot Tribe; therefore, the Wiyot Tribe would be the appropriate tribe to contact if any unknown archaeological resources are discovered.

- **Mitigation Measure CR-1: Identify and Avoid or Minimize Impacts to Unknown Historic and/or Archaeological Resources**

MCSD shall ensure that if concentrations of prehistoric or historic-period materials are encountered as a result of ground-disturbing activity attributable to the project, all work in the immediate vicinity shall halt until a qualified archaeologist can evaluate the finds and make recommendations. The recommendations of the archaeologist shall be implemented. Prehistoric materials could include obsidian and chert debitage or formal tools, grinding implements, (e.g., pestles, handstones, bowl mortars, slabs), locally darkened midden, deposits of shell, faunal remains, and human burials. Historic materials could include ceramics/pottery, glass, metal, can and bottle dumps, cut bone, barbed wire fences, building pads, structures, and trails/roads.

If such materials are encountered during construction, MCSD shall retain a qualified archaeologist who shall be present during subsequent surface and subsurface activities in the vicinity of the sensitive materials as determined necessary by the archaeologist. With respect to these areas of sensitive materials:

- Ground disturbance shall be monitored by a qualified archaeologist with the authority to temporarily halt work and redirect equipment if cultural materials are discovered.
- If cultural materials are discovered, the archaeologist shall assess the discovery to determine if it constitutes either a unique archaeological resource or a historical resource for purposes of CEQA (CCR Title 14 §15064.5[a]).
- If the archaeologist determines that the materials do not constitute either a unique archaeological resource or a historical resource, their presence shall be noted but need not be considered further (CCR Title 14 §15064.5[c] [3]).
- If the archaeologist determines: (a) that the materials do constitute a unique archaeological resource or historical resource; and, (b) they are subject to substantial adverse change as defined in CCR Title 14 §15064.5[b], the archaeologist shall provide recommendations to MCSD for appropriate treatment which, among other options, may include preservation in place or archaeological data recovery. Preservation in place is preferred, if it is feasible.

Implementation of Mitigation Measures CR-1 would reduce potentially significant impacts to less than significant levels by protecting, preserving, or recovering any significant cultural resources affected by project construction. No impact to historic resources is anticipated.

c) Paleontological or Geological Resources – Less than Significant Impact

Paleontological resources are the remains or traces of prehistoric animals and plants. Paleontological resources, which include fossil remains and geologic sites with fossil-bearing strata are non-renewable and scarce and are a sensitive resource afforded protection under environmental legislation in California. Under California PRC Section 5097.5, unauthorized disturbance or removal of a fossil locality or remains on public land is a misdemeanor. State law also requires reasonable mitigation of adverse environmental impacts that result from development of public land and affect paleontological resources (CPR Section 30244).

The project area has the potential to contain paleontological resources. Although it is unlikely that project construction would impact potentially significant paleontological resources because there will be no new disturbance associated with project construction compared to what was done with construction of the existing WWMF. Additionally, the project site does not include any unique geologic features. The impact is less than significant.

d) Human Remains – Less than Significant Impact

Although no known cemeteries or burial sites are located on the project site, given the long history of human activity in the area, encountering human remains during construction activities is possible. If human remains are discovered during construction of the project, impacts could be significant. As such, Environmental Protection Action 2, Procedures for Encountering Human Remains, has been incorporated into this project to reduce this potentially significant impact to less than significant by providing standard procedures in the event that human remains are encountered during project construction and adherence to PRC Section 5097.98 requiring Native American tribal notification.

3.6 Geology and Soils

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.			✓	
ii) Strong seismic ground shaking?			✓	
iii) Seismic related ground failure, including liquefaction?			✓	
iv) Landslides?			✓	
b) Result in substantial soil erosion or the loss of topsoil?			✓	
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on, or off, site landslide, lateral spreading, subsidence, liquefaction or collapse?			✓	
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), 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?			✓	

3.6.1 Discussion

Seismic Hazards

The following information on seismic hazards is excerpted from the Wastewater Facilities Plan prepared by SHN (SHN 2011) and the Geotechnical Report (Appendix A) prepared by LACO (LACO 2013).

McKinleyville is located within the Mad River fault zone. This zone consists of several major northwest-trending thrust faults and numerous minor, secondary synthetic and antithetic faults. Major faults within this zone include, from north to south, the Trinidad, McKinleyville, Mad River, and Fickle Hill faults. The McKinleyville and Mad River faults both pass through McKinleyville, although not directly underneath the project site. Earthquake Fault Zones, as defined by the State's "Alquist-Priolo Earthquake Fault Zoning Act," are associated with both of these faults. Individual faults within the Mad River fault zone commonly exhibit variable strikes, which is common along thrust faults, and shallow to moderate dips ranging from as little as 10° to 55°. In the McKinleyville area, the Mad River fault zone crosses, and displaces, the flight of marine terraces described above. The faults typically are well expressed across the terraces as west- and southwest-facing scarps separating the displaced, relatively flat terrace surfaces. Antithetic faults within the Mad River fault zone typically are associated with lesser amounts of cumulative displacement, and form subtle northeast-facing scarps.

The principal faults within the Mad River fault zone are considered active by the State of California, and are included within Alquist-Priolo Earthquake Fault Zones. Of primary concern relative to MCSD facilities, the Mad River fault passes through the "Hiller Reclamation" area, just east of the WWMF treatment ponds. If a moderate or large magnitude earthquake were to occur along the Mad River fault, ground shaking at the facilities would be severe. In addition, if fault rupture were to be generated in such an event, it would presumably significantly impact piping and other infrastructure that crosses the fault trace.

All of coastal Northern California is subject to potentially strong seismic ground shaking and multiple earthquake sources capable of generating moderate to strong earthquakes are in close proximity to the project site (as noted above). Strong seismic shaking is a regional hazard that could cause major damage to the project area. The extent of ground-shaking during an earthquake is controlled by the earthquake magnitude and intensity, distance to the epicenter, and the geologic conditions in the area.

Due to the proximity to active seismic sources, localized areas in McKinleyville may be subject to secondary seismic effects, such as liquefaction, lateral spread, and seismically-induced landsliding. Liquefaction is the sudden loss of soil shear strength due to a rapid increase of soil pore water pressures caused by cyclic loading from a seismic event. In simple terms, it means that a liquefied soil acts more like a fluid than a solid when shaken during an earthquake. In order for liquefaction to occur, the following are needed:

- granular soils (sand, silty sand, sandy silt, and some gravels),
- a high groundwater table,
- a low density of the granular soils (usually associated with young geologic age).

The preliminary liquefaction analysis performed for the site indicates that there is low potential for soil liquefaction to occur at the site where groundwater is deeper than 25 feet (as measured from the top of the embankments). The soils shallower than 25 feet may be susceptible to liquefaction when saturated. Granular fills on the project site are suitable for use as structural fill as long as they meet the gradation requirements in the geotechnical recommendations.

In the McKinleyville area, these conditions generally are confined to recent alluvial deposits along streams, and recent beach deposits. The adverse effects of liquefaction include local and regional ground settlement, ground cracking and expulsion of water and sand, the partial or complete loss of bearing and confining forces used to support loads, amplification of seismic shaking, and lateral spreading. Lateral spreading is defined as lateral earth movement of liquefied soils, or competent strata riding on a liquefied soil layer, downslope toward an unsupported slope face, such as a creek bank, or an inclined slope face. For the most part, lateral spreading has been observed on low to moderate gradient slopes, but has been noted on slopes inclined as flat as one degree.

Landslides

Landslides are gravity-driven downslope movements of earth materials, typically triggered by earthquakes, or elevated pore pressures, resulting from peak rainfall events. Factors that influence the susceptibility of an area to landslides, or mudflows, include slope gradient, the nature of earth materials, vegetative cover, and groundwater levels.

Slope stability hazards are a significant concern in Humboldt County, due to the steeply sloping terrain and unconsolidated bedrock, combined with heavy seasonal rains. The majority of McKinleyville is located on the flat, relatively stable McKinleyville Terrace, where slope stability concerns are minimal. The Geotechnical Report concluded that the potential for slope instability to adversely affect the project is low (LACO 2013).

Soil

LACO Associates conducted geotechnical explorations at the WWMF in May 2013; explorations consisted of five geotechnical borings (LACO 2013). The soils under the project site primarily consist of loose to medium dense, dark brown silty sand underlain by medium dense to dense, gray brown poorly to well graded marine terrace sands. In the areas currently explored, native soils were generally encountered below an approximately 14- to 19-foot thick layer of engineered fill. Groundwater was encountered in the deep geotechnical borings at depths ranging from 25 to 28 feet below ground surface (bgs).

a.i) Fault Rupture – Less than Significant Impact

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. This act prohibits the location of structures designed for human occupancy across active faults and regulates construction within fault zones. The project site is not located within an Alquist-Priolo earthquake fault zone. The closest active splay of the Mad River fault, which is not considered active, projects through the project site (LACO 2013).

Given that the project site is located approximately 700 feet west of the identified trace of the Mad River fault and the splay of the fault identified within the project area is considered inactive, the Geotechnical Report judged that the risk of fault rupture to occur within the project site is low (LACO 2013).

Buildings and treatment structures would be designed to resist the effects of earthquake ground motions in accordance with adopted building codes and national standards for non-building structures. The purpose of the earthquake provisions in building codes is primarily to safeguard against major structural failures and loss of life, not to limit damage or maintain function. The design basis ground motion utilized in the design of the buildings and treatment structures is that ground motion that has a 10 percent chance of being exceeded in 50 years. The design of new buildings and the earthquake forces would be determined considering seismic zoning, site characteristics, occupancy, configuration, structural system and building height. The existing buildings and new buildings are primarily bearing wall structural systems with CMU shear walls utilized as the lateral force resisting system. Existing and new buildings typically have flexible roof diaphragms of either plywood or structural metal materials.

All buildings, structures and facilities would be designed in accordance with the Geotechnical Report and all other applicable codes, thereby, reducing the exposure of people or structures to potential substantial adverse effects from fault rupture. Additionally, the project does not include housing or structures for human occupancy subject to the Alquist-Priolo Act. The impact is less than significant.

a.ii) Ground Shaking – Less than Significant Impact

While strong seismic ground shaking is possible due to the project site's close proximity to the Mad River Fault, and because all of Northern California is subject to potentially strong ground shaking, project facilities have been designed by professionally registered civil engineers and geologists to industry standards pursuant to Title 24 of the California Building Code to mitigate potential hazards to project structure foundations posed by seismically induced strong ground motion. Incorporation of the recommendations in the Geotechnical Report into the design of structures and equipment for the project would minimize the risk of potential damage including the risk of loss, injury, or death involving strong ground shaking (LACO 2013). Additionally, the project does not involve the construction of structures which would be occupied by people. The impact is less than significant.

a.iii), c. Liquefaction & Unstable Soil – Less than Significant Impact

The project would not include residential development, occupied structures, or critical facilities that would be subject to liquefaction. The preliminary liquefaction analysis performed for the site indicates that there is low potential for soil liquefaction to occur at the site where groundwater is deeper than 25 feet (as measured from the top of the embankments). The soils shallower than 25 feet may be susceptible to liquefaction when saturated. Groundwater was encountered in the deep geotechnical borings at depths ranging from 25 to 28 feet bgs (LACO 2013).

The design report and drawings for the project have been designed by professionally registered civil engineers and geologists to industry standards. In addition, the design recommendations in the Geotechnical Report conducted for the project would be implemented which would minimize the risk of potential damage as a result of lateral spreading, subsidence, liquefaction, or collapse. Therefore, the project would not expose people or structures to potential substantial adverse effects from liquefaction and the impact would be less than significant.

a.iv) Landslides – Less than Significant Impact

The project site is located on flat terrain away from significant slopes. According to the Geology and Geomorphic Features Related to Landsliding, Arcata North 7.5' quadrangle for Humboldt County, the project area is not prone to landslides (California Department of Conservation 1984). The Geotechnical Report concluded that the potential for slope instability to adversely affect the proposed project is low (LACO 2013). Therefore, the project is not anticipated to people or structures to substantial risk of landslides for the reasons stated above. The impact is less than significant.

b) Loss of Topsoil – Less than Significant Impact

Long-term erosion at the project site is unlikely due to the relatively flat topography. Construction activities, including trenching, excavation, grading, and operation of heavy equipment would disturb soil and, therefore, have the potential to cause erosion. Subject to regulatory approval, an erosion control plan (Environmental Protection Action 3) and SWPPP (Environmental Protection Action 4) would be prepared (or updated) for the project prior to the start of construction and soil disturbance. The erosion control plan would include BMPs designed to reduce erosion of exposed soil and minimize the sediment entrained in runoff from the site during construction. BMPs may include: silt fences, straw bales and wattles, soil stabilization controls, site watering for controlling dust, and sediment detention basins. Ground disturbance in non-sensitive habitat areas would be mulched with straw or other appropriate material, as necessary under the SWPPP for the project. Per Government Code Section 53091 the WWMF is exempt from building permits from Humboldt County, which includes a grading permit. With the implementation of Environmental Protection Actions 3 and 4, potential impacts to soil erosion or the loss of topsoil would be less than significant.

d) Expansive Soils – Less than Significant Impact

Expansive soil is defined as soil that expands to a significant degree upon wetting and shrinks upon drying. Generally, expansive soils contain a high percentage of clay. According to the Soils of Western Humboldt County, California, prepared by the Department of Soils and Plant Nutrition, University of California Davis (U.C. Davis 1965), soils in the project area are Arcata loam (moderately well drained, 0-3% slopes). This soil is finer textured than the fine sandy loam, and contains a higher percentage of organic matter in the surface. It has a higher percentage of available moisture and is higher in nutrients. This soil does not have expansive characteristics as defined by the California Building Code and the project would not create substantial risks to life or property. Furthermore, the Geotechnical Report concluded that the risk of expansive soils detrimentally affecting the proposed improvements at the project site is low (LACO 2013). Adherence to the recommendations in the Geotechnical Report and applicable codes would result in a less than significant impact.

e) Septic Tanks – No Impact

The project includes improvements to the WWMF and does not include use of septic or other alternative wastewater disposal systems. Therefore, no impact would result with regard to the capability of soils to adequately support the use of septic tanks or alternative wastewater disposal systems. No impact has been identified.

3.7 Greenhouse Gas Emissions

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			✓	
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?				✓

3.7.1 Discussion

Climate change refers to change in the Earth's weather patterns including the rise in the Earth's temperature due to an increase in heat-trapping or GHGs in the atmosphere. Unlike emissions of criteria and toxic air pollutants, which have local or regional impacts, emissions of GHGs that contribute to global warming or global climate change have a broader, global impact. Global warming is a process whereby GHGs accumulating in the atmosphere contribute to an increase in the temperature of the Earth's atmosphere. The principal GHGs contributing to global warming are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O) and fluorinated compounds. These gases allow visible and ultraviolet light from the sun to pass through the atmosphere, but they prevent heat from escaping back out into space. Among the potential implications of global warming are rising sea levels, and adverse impacts to water supply, water quality, agriculture, forestry, and habitats. In addition, global warming may increase electricity demand for cooling, decrease the availability of hydroelectric power, and affect regional air quality and public health. Like most criteria and toxic air contaminants, much of the GHG production comes from motor vehicles. GHG emissions can be reduced to some degree by improved coordination of land use and transportation planning at the community, county and subregional level, and other measures to reduce automobile use. Energy conservation measures also can contribute to reductions in GHG emissions (BAAQMD 2012).

The California Global Warming Solutions Act of 2006 (Assembly Bill 32, AB 32) definitively established the state's climate change policy and sets GHG reduction targets (Health & Safety Code §38500 et seq.). AB 32 requires the reduction of statewide GHG emissions to 1990 levels by 2020.

The NCUAQMD does not have rules, regulations, or thresholds of significance for non-stationary or construction-related GHG emissions. In 2011, the NCUAQMD

adopted Rule 111 - Federal Permitting Requirements for Sources of Greenhouse Gases to establish a threshold above which New Source Review (NSR) and federal Title V permitting applies and to establish federally enforceable limits on potential to emit greenhouse gases for stationary sources. These are considered requirements for stationary sources and should not be used as a threshold of significance for non-stationary source projects.

The current Humboldt County General Plan in force predates modern planning relevant to GHG emissions and global warming. Through the ongoing General Plan update process, Humboldt County has informally established relevant draft goals and policies applicable to reducing GHG emissions; however, as of June, 2014 the county has not adopted the General Plan.

In 2007 the Humboldt County Board of Supervisors initiated a campaign in effort to reduce county-wide carbon emissions by committing to implement the following milestone steps:

- Conduct a baseline emissions inventory and forecast of emissions growth.
- Set an emissions reduction target.
- Develop a Climate Action Plan to meet the emissions reduction target.
- Implement the Climate Action Plan.
- Monitor and report progress and results.

Though not yet adopted or finalized, the ongoing General Plan update recognizes the county's intent to reduce GHG emissions in the unincorporated area resulting from its discretionary land use decisions to 10 percent below 2003 levels by 2020 as part of a county-wide Climate Action Plan. The county also intends to reduce GHG emissions in its own operations to 10 percent below 2003 levels by 2020.

a) Generation of Greenhouse Gas Emissions – Less than Significant Impact
Construction

Construction of the project would cause GHG emissions as a result of combustion of fossil fuels used in construction equipment, vehicles from workers commuting to and from the site, and the importing of structural fill from trucks. The project would require the use of several pieces of heavy earthmoving equipment, delivery trucks, construction commute and utility vehicles, paving equipment, in addition to generators, and other small engine-powered tools. The NCUAQMD has not adopted a threshold for construction-related GHG emissions against which to evaluate significance and has not established construction-generated criteria air pollutant screening levels above which quantitative air quality emissions would be required.

Guidelines established by the Sacramento Metropolitan Air Quality Management District (SMAQMD) suggest that the district would expect quantitative analysis to be conducted for projects substantially greater in scope than the proposed project. For example, quantitative analysis would be expected for a school or commercial facility construction project over 30 acres, a city park over 60 acres, or a single family

residential development with over 180 units (SMAQMD 2009). Project emissions during construction of the project would be during construction only, would not approach the level of emissions associated with these reference project types, and would not cause a considerable contribution to the cumulative GHG impact at the regional or state level. Given the project's scale, scope, and duration, it would not have a measurable or considerable contribution to the cumulative GHG impact at the local, regional or state level. The impact from construction would be less than significant.

Operations

The project would include only minor operational GHG emissions associated with the operation, repair and maintenance of the new blower/electrical/maintenance building, new headworks and secondary clarifiers. The operation, repair and maintenance of these facilities would not lead to a substantial increase in GHG emissions or a related impact. The impact from operations would be less than significant.

b) Conflict with an Applicable Plan, Policy or Regulation – No Impact

As stated above, Humboldt County has prepared draft goals and policies related to GHG emissions as part of the General Plan update process, but has not yet adopted any formal GHG emission reduction policies in its General Plan or in a Climate Action Plan. Although the project would produce construction- and operational-related emissions, the project would not conflict with any plans, policies, or regulations, adopted for the purpose of reducing the emissions of greenhouse gases. No impact has been identified.

3.8 Hazards and Hazardous Materials

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			✓	
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			✓	
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				✓
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?				✓
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?			✓	
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				✓
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				✓
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?			✓	

3.8.1 Discussion

Hazardous Materials

Hazardous materials are substances, or a combination of substances, that, due to quantity, concentration, physical, chemical, radiological, explosive, or infectious characteristics, pose a potential danger to humans or the environment. Generally, these materials are categorized as: explosive and blasting agents; flammable and nonflammable gases; combustible liquids and solids; oxidizers; poisons; disease-causing agents; radioactive materials; corrosive materials and other materials, including hazardous wastes.

Current operations at the WWMF involve transport, storage, use, and disposal of hazardous materials. Wastewater treatment operations by intention typically involve the use of hazardous materials during routine operations for disinfection and treatment of wastewater and during routine facility maintenance for painting and diesel powered equipment maintenance. Many of the materials used in routine operation at the WWMF are considered hazardous and while many are stored and used in significant quantity on a daily basis, use of, and access to these materials is strictly controlled. Furthermore, materials used for painting and equipment repair activities generally are maintained at the WWMF in limited quantities and stored and handled following manufacture and regulatory agency guidelines for safety.

Routine operations at the WWMF include use and storage of wastewater treatment chemicals such as sodium hydroxide, magnesium hydroxide and calcium hydroxide that are transported to the site in bulk quantities and stored for daily use. Operations at the site also generate the flammable and toxic gases methane and hydrogen sulfide.

The WWMF is not included on the 'Cortese' list of hazardous materials sites compiled pursuant to Government Code Section 65962.5.

Airport Hazards

The Arcata/Eureka Airport (ACV) is located in McKinleyville and within MCSD's service area. The ACV is located approximately 1.9 miles northeast of the project site and is the primary regional commercial airport serving Humboldt County. Primarily, the airport is a commercial service airport providing airline and general aviation services to the community and the flying public. Additionally, the U.S. Coast Guard Search and Rescue Base is located on the airport grounds. Crashes and fires associated with aircraft landing, take-off, and fueling operations near the airport are a potential source of hazardous conditions and material releases.

Emergency Response and Evacuation Planning

Federal and State laws require local jurisdictions to prepare Emergency Response Plans (ERPs) that address interruptions of water and power due to earthquakes, fires, floods, sabotage and terrorist acts. Humboldt County is the primary agency responsible for emergency response and evacuation planning. The Humboldt County Emergency Operations Plan addresses a planned response to extraordinary

emergency situations associated with natural disasters, technological incidents, and national security emergencies in or affecting Humboldt County. The Humboldt County Operational Area Hazard Mitigation Plan inventories the potential natural hazards in the county, assesses the risk to people, buildings and critical facilities, and develops a mitigation strategy to reduce the risk of exposure and allow a swift and organized recovery should a disaster occur.

Wildland Fire

The project site is located in an unincorporated Local Responsibility Area (LRA), as classified by the California Department of Forestry and Fire Protection (CAL FIRE 2008). CAL FIRE has classified and mapped the fire severity zones within LRA areas within the project site as LRA Moderate and Unzoned. Humboldt County's GIS classifies the project area as having a "Low Fire Rating."

a) Transport, Use, and Disposal of Hazardous Materials – Less than Significant Impact

Project construction would require the use of hazardous materials such as fuels, lubricants, paints, and solvents. Construction activities for the project would be short-term and one-time in nature, and would involve the limited transport, storage, use, or disposal of hazardous materials. Some examples of hazardous materials handling include fueling and servicing construction equipment on-site, and the transport of fuels, lubricating fluids, and solvents. These types of materials; however, are not acutely hazardous, and all storage, handling, and disposal of these materials are regulated by the Department of Toxic Substances Control (DTSC), the U.S. EPA, the Occupational Safety & Health Administration (OSHA), and the Arcata Fire Protection District.

Following construction, the project would result in the storage and transport of hazardous materials, similar to existing operational conditions for the WWMF as discussed above. Chemicals to be used include but are not limited to sodium hydroxide, magnesium hydroxide and calcium hydroxide. Hazardous areas would be classified in accordance with the National Electrical Code and the National Fire Protection Association. All equipment located within hazardous areas would be suitable for the location.

Numerous laws and regulations ensure the safe transportation, use, storage and disposal of hazardous materials. Worker safety regulations cover hazards related to exposure to hazardous materials. Regulations and criteria for the disposal of hazardous materials mandate disposal at appropriate landfills. Because the MCSD, contractors, and other construction service providers would be required to comply with existing hazardous materials laws and regulations for the transport, use, and disposal of hazardous materials, the impacts associated with the project having the potential to create a significant hazard to the public or the environment would be less than significant.

b) Upset or Accidents Involving Hazardous Materials – Less than Significant Impact

Implementation of the proposed project could 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. Routine operations at the project site would include use and storage of wastewater treatment chemicals such as sodium hydroxide, magnesium hydroxide and calcium hydroxide (non-hazardous) that are transported to the site in bulk quantities and stored for daily use. Operations at the site are also expected to generate flammable and toxic gases such as methane and hydrogen sulfide. As such, there are reasonably foreseeable upset or accident conditions that could create a significant hazard to the public and/or on-site personnel due to the release of these hazardous materials. However, hazardous areas would be classified in accordance with the National Electrical Code and the National Fire Protection Association, and all equipment located within hazardous areas would be suitable for the location.

The following plans are also required of MCSD: the MCSD Risk Control and Safety Plan (Emergency Operations Plan); the Process Safety Management Plan (for accidental release of chlorination and SO₂); the Hazard Communication Plan (Humboldt County requirement); and the Security Vulnerability Assessment Template (EPA requirement). Additionally, the MCSD has an Overflow Emergency Response Plan (OERP) that identifies measures to protect public health and the environment. Adherence to the plans noted above and applicable regulations regarding the release of hazardous materials into the environment would result in a less than significant impact.

c) Emit Hazardous Materials within 0.25 Mile of a School – No Impact

There is no impact related to the potential for the project to emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school, as no public schools are located or proposed for construction within 0.25 mile of the project Site. The closest public school to the project site is Morris Elementary School which is approximately 0.57 mile northwest of the project site. No impact has been identified.

d) Included on a List of Hazardous Materials Sites – No Impact

There are no hazardous materials sites compiled pursuant to Government Code Section 65962.5 (Hazardous Waste and Substances Site List or “Cortese” list) within the project area. The nearest site on this list is the McNamara and Peepe Lumber Mill, in Arcata, approximately 6.1 miles southeast of the project site. GHD further researched listed sites that have the potential to affect the project by reviewing available records on the SWRCB GeoTracker Website. The project is not located on a Cortese list and would therefore not create a hazard to the public or environment. No impact would occur.

e) Safety Hazard for People Residing or Working Within Two Miles of a Public Airport – Less than Significant Impact

The nearest public airport to the project site is the ACV, located approximately 1.9 miles northeast of the WWMF. The project site is not located beneath the approach, departure, or sideline zones of the airport, areas of greatest hazard to people on the ground. Furthermore, as this project is the improvement of the WWMF and requires no change in zoning for the site; the impact is considered less than significant.

f) Safety Hazard for People Residing or Working within Two Miles of a Private Airstrip– No Impact

There are no private airstrips within two miles of the project site. The project would not result in airport-related safety hazards for people residing or working in the project area. No impact would occur.

g) Impair or Interfere with an Adopted Emergency Response/Evacuation Plan – No Impact

While MCSD's various plans would need to be updated (Emergency Operations Plan, Process Safety Management Plan, Hazard Communication Plan, and the Security Vulnerability Assessment Template) and revised to include the new equipment that would be added under the project, the plant's hazardous materials management and emergency response procedures including evacuation routes and the evacuation plan would remain the same. Therefore, the project would not impair or interfere with any emergency response/evacuation plans and does not include development that would significantly increase the number of people exposed to potential emergencies. No impact has been identified.

h) Exposure to Wildland Fires – Less than Significant Impact

The project would not expose people or structures to a risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands. The WWMF is located in a primarily developed area of McKinleyville between Highway 101 and the Mad River; however, lands immediately surrounding the WWMF do include forest land and grasslands. The surrounding area does not contain dense areas of flammable brush, grass, or trees. The site is not near areas containing dense vegetation (flammable brush) considered to be wildlands. CAL FIRE has classified and mapped the project area as LRA Moderate and Unzoned, and Humboldt County's GIS classifies the project area as having a "Low Fire Rating." Furthermore, the project is required to comply with local fire code requirements. The impact is less than significant.

3.9 Hydrology and Water Quality

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
Would the project:				
a) Violate any water quality standards or waste discharge requirements?			✓	
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?			✓	
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off- site?			✓	
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off- site?			✓	
e) 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?				✓
f) Otherwise substantially degrade water quality?			✓	
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				✓
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?			✓	

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?			✓	
j) Inundation by seiche, tsunami, or mudflow?			✓	

3.9.1 Discussion

Surface Water

The Mad River is located approximately 1,000 feet west of Pond 1A. The WWMF discharges to surface waters, and the District is required to maintain a NPDES permit that sets forth specific discharge requirements to ensure protection of public health, environmental health, and water quality. This permit is renewed every five years by the NCRWQCB. At each renewal, the permit may incorporate new treatment objectives and discharge standards that require an upgrade or modification to the facility to meet new regulatory requirements.

During the discharge period, October 1 through May 14, treated wastewater effluent is discharged to the Mad River, or, if the flow in the river is less than 200 cubic feet per second, effluent is discharged to the percolation ponds adjacent to the river and/or to land for reclamation (use as irrigation water). During the discharge prohibition period, May 15 through September 30, effluent is discharged to the percolation ponds and/or to land for reclamation. Land discharge occurs at the Lower Fisher Ranch, Upper Fisher Ranch, the Hiller Parcel, and the Pialorsi Ranch.

Stormwater

The current permit for the MCSD WWMF, NPDES Permit No. CA0024490, Order No. WQ 2011-0008-DWQ, was adopted April 19, 2011, and includes Waste Discharge Requirements for effluent treatment, discharge, and reclamation. The current permit went into effect on April 19, 2011, and expires on April 18, 2016.

The County of Humboldt has prepared a Stormwater Management Program (SWMP) for McKinleyville in response to SWRCB Water Quality Order 2003-0005-DWQ for Phase II of the NPDES. The goal of the SWMP is to protect water quality from the impacts of stormwater runoff through compliance with Phase II NPDES permit requirements and applicable regulations, and to foster maximum public involvement and awareness of stormwater issues. The SWMP outlines activities to be implemented during the first five-year NPDES permit period.

The area of McKinleyville included within the SWMP occupies approximately 11.3 square miles and includes six separate drainages. The plan area is bounded on the

north by the outer boundary of the Norton Creek Drainage, on the south by the Mad River, on the west by the Pacific Ocean, and on the east by the first ridgeline separating the area's coastal stream watersheds (Humboldt County 2005). The plan area is situated along the coastal terrace between the Mad and Little rivers at elevations ranging from approximately zero to 500 feet above mean sea level. Stormwater from these areas drains to the Mad River near its confluence with the Pacific Ocean. The six drainages within the plan area range in size from 0.7 to 3.8 square miles in area.

The SWMP for McKinleyville contains the following information: the area covered by the SWMP; BMPs for each of the six Minimum Control Measures; measurable goals for each of the BMPs (i.e., narrative or numeric standards used to gauge program effectiveness); a timeline for implementation of each measure; and individual(s) or group(s) responsible for implementing or coordinating the stormwater program.

Flooding

The WWMF is located north and east of the Mad River and south of Widow White Creek. The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Map Number 0600600625B, effective July 9, 1982, the project area is located within an area designated as Zone C, or "areas of minimal flooding." Therefore, the risk of flooding to occur at the project site is considered low.

The California Building Code specifies requirements for tsunami inundation zones. Restrictions are placed on critical facilities such as hospitals and emergency response facilities. The code specifies that "tanks and similar structures" may be constructed in a tsunami inundation zone. No other requirements are specified for such structures. The California Emergency Management Agency (CEMA) Tsunami Inundation Map shows that the WWMF is outside the tsunami inundation boundary (CEMA 2009).

a, d, e, f) Violate Water Quality Standards, Substantially Alter Existing Drainage or Degrade Water Quality – Less than Significant Impact

Construction of the project could have potentially significant short-term impacts on stormwater quality during construction due to the potential to introduce sediment and other pollutants (e.g., grease and oil) into stormwater runoff. Because stormwater runoff from the site could enter adjacent forested and vegetated areas under a large storm event, this could also affect water quality within those areas; however, the project description includes implementation of a number of construction BMPs (Environmental Protection Actions 3, 4 and 5) to protect stormwater quality, including erosion control measures and control measures for proper fueling and maintenance of construction vehicles, and dewatering guidelines. With implementation of these measures, construction impacts would be reduced to less than significant levels.

Operation of the project is designed to upgrade the existing WWMF to meet more stringent discharge requirements and future regulatory requirements; therefore, the proposed improvements would improve the quality of the final effluent from the

WWMF. Each of the new project components would be constructed within the footprint of Pond 1A as shown in Figure 2. The new blower/electrical/maintenance building, standby generator, and headworks would be installed on new pavement, in addition to the paved area between the secondary clarifiers and the aeration basins. The remainder of the project footprint would be unpaved, pervious surfaces. Therefore, the project would not substantially increase the amount of impervious surfaces on the WWMF and there would be no substantial increase in the volume or velocity of runoff and no anticipated long-term increase in pollutant loads to stormwater runoff. With implementation of Environmental Protection Actions 3, 4 and 5, adherence to applicable codes and the recommendations in the geotechnical report, operation of the project would have less than significant impacts on water quality.

b) Substantially Deplete Groundwater Supplies or Interfere with Groundwater Recharge – Less than Significant Impact

Because groundwater was encountered at depths of 25 to 28 feet in the geotechnical borings, and secondary clarifier excavations are anticipated to be on the order of 25 feet deep (42 feet, NAVD88), dewatering would likely be needed during construction. Sump pumps, with gravel working pads, should be installed to keep the excavations dry during construction. High groundwater is not expected to be a concern during the lifetime of the structures, and a permanent dewatering system is not recommended. Design, installation, and maintenance of a temporary construction dewatering system are the responsibility of the contractor (LACO 2013).

Dewatering of the construction work area could be required if groundwater accumulates in an excavation area. Dewatering typically involves pumping water out of the excavation area to lower groundwater levels to the extent needed for construction. Any water table draw-down during project construction would be very minor and localized and would not affect the ability of any off-site wells to draw water. Figure 2 shows the areas in the southern portion of Pond 1A that would be paved. The amount of new pavement is not substantial to reduce groundwater recharge in the area. No other aspect of the project would substantially deplete groundwater supplies or interfere with groundwater recharge; therefore, the impact is less than significant.

c) Alter Drainage Patterns – Less than Significant Impact

The project would not substantially alter the existing drainage pattern of the project site or in the area, and would not alter any waterway. The project's geotechnical report (LACO 2013) concludes that the project site should generally be graded to provide positive drainage away from foundations; a five percent gradient should be maintained for landscaped areas within 10 feet of a structure; grading or landscaping design and construction should not allow water to pond on the project site, nor to migrate beneath any structure; runoff from hardscaped areas and other impermeable surfaces should generally be contained, controlled, and collected in a tight-line pipe that outlets into the project site storm drain system. Adherence to

applicable codes and the recommendations in the geotechnical report would result in the project having a less than significant impact on drainage in the project area.

g, Place Housing within a 100-Year Flood Zone – No Impact

The proposed project does not involve construction of housing. Therefore, there would be no impact.

h) Place Structures within a 100-Year Flood Zone – Less than Significant Impact

The FEMA FIRM Map Number 0600600625B, effective July 9, 1982, shows that the project area is located within an area designated as Zone C, or “areas of minimal flooding.” No new structures are proposed within the 100-year flood zone, therefore, new proposed structures are not anticipated to impede or redirect flood flows onto or off the project site. The impact is less than significant.

i) Flooding From a Levee or Dam Failure – Less than Significant Impact

According to the Humboldt Operational Area – Hazard Mitigation Plan (HMP) (Figure 11-2 Dam Inundation Areas in HMP) the project site is not located within a dam failure inundation area (Humboldt County 2008). The project site is adjacent and to the east of the dam failure inundation area for the Mad River. The project does not include any activities or components which would expose people or structures to a significant risk of loss from flooding from a levee or dam failure. The impact is less than significant.

j) Inundation by Seiche, Tsunami, or Mudflow – Less than Significant Impact

Based on area characteristics, the project site is not down-gradient of a debris-flow source and would not be subject to mudflows. The project site is also not near any enclosed large water body capable of producing a seiche event. The most recent tsunami hazard maps published by the State of California Geologic Survey (CGS 2009) indicate that the project site is not within a predicted tsunami inundation zone; therefore, the risk of tsunami inundation occurring at the project site is considered low. The impact is considered less than significant.

3.10 Land Use and Planning

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
Would the project:				
a) Physically divide an established community?				✓
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?			✓	
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?				✓

3.10.1 Discussion

The McKinleyville Area Plan (McKAP) of the Humboldt County Local Coastal Program (Humboldt County 1995) was approved by the Board of Supervisors in 1980 and has been amended over the years since then. The McKAP identifies land uses and standards by which development would be evaluated within the Coastal Zone. It outlines recommendations, policies, and standards, to guide day-to-day decisions concerning future development.

Humboldt County General Plan Land Use designations identify both the types of development (e.g., residential, commercial, and industrial) that are permitted and the density or intensity of allowed development. The General Plan Land Use designation for the project site is Residential Estates (RE). The WWMF is a conditional use within the RE land use designation. Zoning within the project area is generally consistent with General Plan Land Use designations.

a) **Physically Divide an Established Community – No Impact**

The project consists of on-site wastewater facilities improvements at the existing WWMF. No aspect of the project would physically divide an existing community; therefore, no impact would occur.

b) **Conflict with Applicable Land Use Plans, Policies or Regulations – Less than Significant Impact**

The project site is within the unincorporated community of McKinleyville and has a General Plan Land Use designation of RE. The wastewater facility improvements are generally within the existing footprint of Pond 1A with the exception of future

water and sewer lines and the new methanol tank and metering system which would be just south of the existing headworks by approximately 50 feet. The McKAP says that development of wastewater treatment facilities at the WWMF as described in the final EIR and facilities plan for wastewater treatment for the MCSD are consistent with this plan. Therefore, the project would not conflict with the McKAP.

The project is not within the California Coastal Commission's primary jurisdiction, but is within the county's appeal jurisdiction (Humboldt County 2012), therefore, the project would require a Coastal Development Permit from Humboldt County. The project would not require a General Plan Land Use designation or zoning change, and would not conflict with any applicable plan, policy or regulation with jurisdiction over the project area. Therefore, the impact would be less than significant.

c) Conflict with any Applicable Habitat Conservation Plan – No Impact

McKinleyville and Humboldt County do not have an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved conservation plan. No impact would occur.

3.11 Mineral Resources

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?			✓	
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?			✓	

3.11.1 Discussion

According to the Humboldt County General Plan Update Natural Resources and Hazards report, Figure 7-1 – Rock and Mineral Extraction Sites, there are no rock and mineral extraction sites in the immediate project vicinity (Humboldt County 2002). There are, however, multiple rock and mineral extraction sites further upstream on the Mad River.

a, b) Result in the Loss of Availability of a Known Mineral Resource of Value to the Region or Delineated by a General Plan, Specific Plan or other Land Use Plan – Less than Significant Impact

There are no mining operations in the immediate project area. The project would not require the use of a substantial amount of any mineral resource, and would not result in the loss of availability of known mineral resources of value to the State, region or locally; therefore, the impact would be less than significant.

3.12 Noise

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
Would the project:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			✓	
b) Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels?			✓	
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?			✓	
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?			✓	
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				✓
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?				✓

3.12.1 Discussion

The surrounding area is primarily characterized by low density residential uses, recreational uses, Highway 101 to the east, and the Mad River, dunes and Pacific Ocean to the west. Noise levels in the project area vary depending on the proximity of the noise source(s) to human activity. The major noise sources in the project area include Highway 101, and vehicular traffic on arterials and collectors. Highway 101 runs north-south and is approximately 0.3 mile east of the project site. Ambient noise (background noise) levels in the project area are reduced as distance from the human activities listed above are increased. A noise sensitive receptor is a receptor at which there is a reasonable degree of sensitivity to noise, such as residences, schools, hospitals, elder care facilities, libraries, cemeteries, and places of worship.

Noise sensitive receptors and noise sensitive areas in the project area and immediate vicinity include residences to the north and south of the project site.

The Humboldt County General Plan (Humboldt County 1984) identifies the major noise sources in McKinleyville as Highway 101, Central Avenue and the airport. The General Plan specifies that day/night noise levels (L_{dn} ¹) of 45 Ldn indoors and 55 Ldn outdoors are the maximum level below which there are no effects on public health and welfare; however, higher outdoor levels are identified as “normally acceptable” (60 to 70 Ldn) and “normally unacceptable” (70-80 Ldn).

a, c, d) Exposure to Noise in Excess of Established Standards or Substantially Increase Existing Levels – Less than Significant Impact

The primary noise sources in the project area are and would continue to be transportation-related. Highway 101 would continue to have noise impacts in the project area; however, noise impacts from the project itself would be minimal due to the nature of the project and distance of the WWMF to sensitive receptors.

Construction Noise Impacts

The construction phase of the project would require the use of heavy equipment for excavation, grading, etc., and would temporarily increase ambient noise levels for the duration of project construction. Construction activities would also involve the use of smaller power tools, generators, and other sources of noise. During construction, noise levels would vary based on the amount of equipment in operation and the location of the activity in proximity to adjacent uses. Site work and construction of the various structures would each take approximately nine months to complete with site work starting approximately one month prior. Each work component (e.g., dewater Pond 1A, construct foundation, equipment installation, etc.) would take anywhere from two weeks (dewater Pond 1A) to two months (building envelope) to complete. Noise levels would be consistent with the reference noise levels in Table 3.12-1: Construction Equipment Reference Noise Levels as Measured at 50', below.

¹ L_{dn} is the Day-Night Noise Level. L_{dn} is the average sound level in decibels, excluding frequencies beyond the range of the human ear, during a 24-hour period with a 10dB weighting applied to nighttime sound levels.

Table 3.12-1: Construction Equipment Reference Noise Levels as Measured at 50'

Equipment	Noise Level (dB ²)	Equipment	Noise Level (dB)
Drill rig truck	84	Jackhammer	85
Horizontal Boring Hydraulic Jack	80	Large Generator	82
Front end loader or Backhoe	80	Paver or Roller	85
Excavator	85	Dump truck	84

Source: Federal Highway Administration, 2006.

Sound from a point source is known to attenuate, or reduce, at a rate of 6 dB for each doubling of distance. For example, a noise level of 84 dB L_{eq}³ as measured at 50 feet from the noise source would attenuate to 78 dB L_{eq} at 100 feet from the source and to 72 dB L_{eq} at 200 feet from the source to the receptor. Based on the reference noise levels, above, the noise levels generated by construction equipment at the project site may reach a maximum of approximately 85 dB L_{eq} at 50 feet during site excavation, and construction.

The closest noise sensitive receptors are neighboring homes to the north and south. The closest residences to the southern half of Pond 1A, where most of the construction would take place, is approximately 725 feet. At this distance, exterior noise levels near the full reference level (up to 85 dB L_{eq}) would be below the U.S. EPA maximum exterior noise level of 55 dB L_{dn}. Additionally, a typical building can reduce noise levels by 15 to 25 dB with the windows closed (Humboldt County 1984, U.S. EPA 1974), thereby reducing interior noise levels within homes even further.

To further reduce any potential adverse effects to noise sensitive receptors, Environmental Protection Action 6, Noise Reduction Actions, has been incorporated into the project. Under Environmental Protection Action 6 sound abatement measures such as construction hour limitations; semi-stationary equipment (e.g., generators, compressors, etc.) would be located as far as possible from residences near the WWMF or shielded behind a building if feasible; and equipment muffler/maintenance requirements would be implemented. With the implementation of Environmental Protection Action 6, construction noise would be limited in duration and intensity such that construction noise at sensitive receptors would be less than significant. Additionally, there would be no construction on Sundays except in an emergency.

² "dB" is a weighted decibel measurement for assessing hearing risk and, therefore, is used by most regulatory compliance.

³ Equivalent sound level (Leq) is a steady-state sound that has the same energy and A-weighted level as the community noise over a given time interval.

Operational Noise Impacts

The project would add various new facilities at the WWMF while removing some existing facilities, and replacing other existing equipment with new equipment. The most significant new noise-generating equipment would include the blower/electrical/maintenance building, standby generator, headworks and secondary clarifiers. The blower/electrical/maintenance building, standby generator, and headworks would all be farther north than the existing irrigation pump station and headworks, and therefore farther away from the residences over 700 feet to the south. Operational noise levels are anticipated to be similar to, if not less than; existing operational noise levels at the WWMF because the new equipment would be more efficient with regard to noise reduction and further away from residences.

Because of the distance to noise sensitive receptors, and the efficiency of new equipment compared to older equipment, the project is not anticipated to have a substantial permanent or temporary increase in ambient noise levels in the project vicinity above levels existing without the project. Therefore, the impact is less than significant.

b) Exposure to Ground Borne Vibration or Noise – Less than Significant Impact

The project is not expected to generate unusual ground borne vibration or ground borne noise levels. Construction activities typically create a small increase in ground borne vibrations, but the vibration level is rarely significant and diminishes rapidly with distance from the construction equipment unless unusual geological conditions are present. Construction equipment and construction operations for the project would be similar to construction operations at many construction sites. Only pile driving equipment is likely to produce vibration levels felt over larger distances and capable of creating cosmetic damage to older fragile buildings at distances of 100 feet from the equipment. The project does not include any pile driving. The restriction of working hours under Environmental Protection Action 6 would eliminate the impact of equipment-generated vibration during night-time, early morning, and evening hours when people are generally more sensitive to noise and vibration. A less than significant impact would occur related to ground borne vibration or ground borne noise levels.

e, f) Exposure of People Residing or Working Near a Private or Public Airport to Excessive Noise Levels – No Impact

The nearest public airport to the project site is the ACV, located approximately 1.9 miles northeast of the WWMF. The project site is not located beneath the approach, departure, or sideline zones of the airport. The project would not expose people residing or working near the ACV or a private airstrip to excessive noise levels, therefore no impact would occur.

3.13 Population and Housing

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				✓
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				✓
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				✓

3.13.1 Discussion

McKinleyville is the most populated unincorporated area in Humboldt County and is one of the fastest growing communities in the county. The 2010 U.S. Census reported that McKinleyville had a population of 15,177, and the population density was 722.2 people per square mile. The 2010 Census reported that 15,098 people (99.5% of the population) lived in households, 79 (0.5%) lived in non-institutionalized group quarters, and 0 (0%) were institutionalized. Total households in 2010 were estimated at 6,283 (MCSD 2012).

a) Induce Substantial Population Growth – No Impact

The District's Wastewater Facilities Plan, completed in February 2012, presented several treatment alternatives and recommended replacing the existing facultative lagoon system with an in-basin extended aeration system. The major proposed WWMF improvements include a new headworks facility; aeration basins; a blower/electrical/maintenance building; two new secondary clarifiers, including RAS/WAS pumping; and a biosolids storage basin within the existing WWMF footprint. The project would not create any housing nor necessitate the development of housing. It would not result in the extension of utilities or roads or other infrastructure into outlying or exurban areas and would not directly or indirectly lead to the development of new sites that would induce population growth. No impact has been identified.

b, c) Displace Housing or People – No Impact

The project would not result in the displacement of any housing or people.

Wastewater facility improvements would be on-site at the WWMF. No impact would occur.

3.14 Public Services

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
Would the project:				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire Protection?				✓
Police protection?				✓
Schools?				✓
Parks?				✓
Other public facilities?				✓

3.14.1 Discussion

For fire protection services, the project area is protected by the Arcata Fire Protection District, specifically Ward 1. The Arcata Fire Protection District provides structural fire protection and emergency services to McKinleyville and Arcata and surrounding areas. The McKinleyville Station is located approximately one mile east of the WWMF at 2149 Central Avenue.

The Humboldt County Sheriff's Office provides a variety of public safety (court services, corrections, emergency operations) and law enforcement services throughout the county including McKinleyville. The Humboldt County Sheriff's McKinleyville Station provides law enforcement services to the residents of McKinleyville, Fieldbrook, Westhaven, Orick and all other unincorporated areas North of Arcata, and is located at 1608 Pickett Road in McKinleyville.

The school districts serving the project area include McKinleyville Union School District (elementary and middle school) and Northern Humboldt Union High School District (high school). Schools within two miles of the project site include: Morris Elementary School, McKinleyville High School, and McKinleyville Middle School.

MCSD provides recreational facilities and programs throughout the community. Park and recreation facilities (including open space) nearest the project site include Hiller Park, Hiller Sports Complex, the Hammond Trail, Hiller Loop Trail, Mad River Bluffs Trails, and McKinleyville Land Trust. McKinleyville schools issue permits to individuals and groups to use their facilities.

The nearest library to the project site is the McKinleyville Library located at 1606 Pickett Road in Pierson Park in McKinleyville.

a) Substantial Adverse Physical Impacts Associated with New or Altered Fire or Police Protection, Schools, Parks, or other public facilities – No Impact

As discussed in Section 3.13.1, the project would not directly or indirectly induce population growth nor create new demand for services. Therefore, the project would have no impact on the service ratios, response times, or other performance objectives of schools, parks, and other public facilities and services that are based on population growth. The project would not require new or physically altered government facilities to serve the project site. No impact would occur.

3.15 Recreation

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
Would the project:				
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				✓
b) Include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?				✓

3.15.1 Discussion

Reference Section 3.14.1, above, for information on recreational resources in McKinleyville. The project site does not include any recreational facilities; however, Hiller Park and the Hiller Sports Complex are adjacent to the WWMF (Figures 1 and 2).

a) Increase in the Use of Existing Facilities Resulting in Substantial Physical Deterioration – No Impact

As discussed in Impact 3.13.1a (Population and Housing), the project would not directly or indirectly induce substantial population growth. Therefore, the project would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. No impact would occur.

b) Development of Recreation Facilities that Could Result in Adverse Physical Effects on the Environment – No Impact

The project would not include recreational facilities. As discussed in Impact 3.13.1a (Population and Housing), the project would not directly or indirectly induce substantial population growth. Therefore, the project would not require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment. No impact would occur.

3.16 Transportation/Traffic

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
Would the project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?			✓	
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?				✓
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?				✓
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?			✓	
e) Result in inadequate emergency access?			✓	
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?			✓	

3.16.1 Discussion

Roadways

Highway 101, located approximately 0.3 mile east of the existing control building at the WWMF is the principal highway for north-south travel in Humboldt County.

Through McKinleyville, the highway is a four-lane controlled-access roadway. There is no Highway 101 interchange at Hiller Road; therefore access to Highway 101 from the WWMF is via Hiller Road, and then either Murray Road or School Road/Central Avenue to the north, and south, respectively.

Level of Service

Level of Service (LOS) is a quantitative measure that characterizes operation of transportation facilities. Using data relative to volumes, right-of-way (ROW) controls, and lane configurations, the relative experience of drivers using the transportation system can be evaluated. It “grades” the operation of the facility similar to a report card; a LOS of “A” is representative of generally free-flowing conditions while a LOS of “F” is representative of long delays or failed operations. In Humboldt County, typically, LOS “D” is used as the design standard in urban areas and LOS “C” is used as the design standard in rural areas. The majority of county roads currently have an acceptable LOS rating (C or better) with limited exceptions, most notably Highway 101 south of Garberville and State Route (SR) 99 south of the Hoopa Indian Reservation (Humboldt County 2012).

Public Transportation

Redwood Transit Service (RTS) is the principal transit service within McKinleyville, providing local and intercommunity service. Operated by the Humboldt Transit Authority, RTS provides fixed route service along the Highway 101 corridor from Trinidad in the north to Scotia in the south, and along Highway 299 connecting Widow White Creek with the Arcata Transit Center.

Pedestrians and Bicycles

Walking and cycling are year-round transportation choices for many Humboldt County residents. Pedestrian facilities (sidewalks on public streets) are provided in varying coverage throughout McKinleyville. Bicycle lanes exist in McKinleyville; however, the community has limited systems of bike lanes and designated routes. The only example of a Class I bike path in Humboldt County is the Hammond Coastal Trail, in McKinleyville, which provides a non-motorized environment for both transportation and recreation purposes. It extends from Clam Beach to the Mad River (HCAG 2008).

a) Conflict with an Applicable Plan, Ordinance, Policy, or Program Establishing Measures of Effectiveness for the Performance of the Circulation System – Less than Significant Impact

The paved areas would provide all-weather vehicle access to each process unit. The roadways would also serve as underground utility corridors. Paved areas would provide two-way traffic with adequate turning radii for emergency services (fire trucks) and chemical deliveries. A new roadway would run along the south side of the new aeration basins and around the new blower building, giving good access to the headworks and blower building. A second roadway would run to the secondary clarifiers and biosolids storage basin. Parking areas would be provided per applicable code requirements.

Project activities would generate temporary construction-related traffic and traffic from large trucks for the approximate 42,600 cubic yards of imported fill material. The timeframe for trucks delivering imported fill could range from April 2015 through December 2015 (based on the current construction schedule). Truck trips are estimated at eight trips per day, which would not substantially increase traffic in the project area and would not negatively impact LOS in area roadways. Road and lane closures are not expected.

Project activities would have an anticipated duration of approximately 15 months (or 375 days) (March, 2015 through June, 2016), assuming six work days per week Monday through Friday) from the hours of 7:00 AM and 6:00 PM, and 10:00 AM and 5:00 PM on Saturdays. No construction would be allowed on Sundays, except in an emergency. Because of the temporary nature of project activities, including vehicle/truck trips and construction duration, project activities would increase traffic on local roadways, but not create a substantial increase in traffic on roads within the project area and on Highway 101.

Given the low traffic level on most McKinleyville roadways during the week, aside from congestion around schools in the morning and afternoon, and the availability of alternate routes for worker commute travel through the project area, the potential impacts to motor vehicles, pedestrians, and bicyclists would be minor.

The design plan prepared by Kennedy/Jenks Consultants (2014) states that “within seven (7) days after the Notice to Proceed, the Contractor shall submit a draft Traffic Plan to the Engineer for review that shall include but not be limited to providing a list of all proposed haul routes with the necessary regulatory approvals hauling to each land application site, storage, and disposal facility, the estimated number and duration of haul trips, the types, sizes and capacity of vehicles to be used, on-site staging and loading areas and traffic routes.”

For long-term project operations, the project would not generate traffic that, either cumulatively or individually, impacts the LOS for designated roads and highways, established by the Highway Capacity Manual and the Humboldt County General Plan. With implementation of the Traffic Plan, the short-term impacts on traffic, bicycle and pedestrian circulation attributable to project construction activities would result in a less than significant impact.

b) Conflict with an Applicable Congestion Management Program – No Impact

There is no Congestion Management Program (CMP); therefore, there would be no impact.

c) Result in a Change in Air Traffic Patterns – No Impact

The ACV is located in McKinleyville and within MCSD’s service area. The ACV is located approximately 1.9 miles northeast of the project site and is the primary regional commercial airport serving Humboldt County. No aspect of the project would affect air traffic patterns; therefore, there would be no impact.

d) Substantially Increase Hazards due to a Design Feature or Incompatible Use – Less than Significant Impact

The project would not change the geometry of any street or the roadway network in the project area. Therefore, no potentially hazardous roadway design features would be introduced by the project. Traffic trips to and from the WWMF would remain the same or similar as under existing conditions.

As discussed above, the presence of construction vehicles and equipment on nearby roadways could increase the normal traffic hazard in the project area. The project would require traffic safety control procedures to accommodate traffic during construction. Work hours would be confined to 7:00 AM to 6:00 PM, Monday through Friday, and 10:00 AM to 5:00 PM on Saturdays. No construction would be allowed on Sundays, except in an emergency.

Construction equipment and delivery trucks would access the project site from Hiller Road. Construction vehicles would generally not be parked to block public ROW. To prevent interferences to emergency vehicles and/or conflicts between day-to-day traffic and project construction activities, a Traffic Plan, as described under a) above, would be prepared within seven days of the Notice to Proceed. The project would not substantially increase hazards due to a design feature or incompatible use; therefore, the impact is less than significant.

e) Result in Inadequate Emergency Access – Less than Significant Impact

The project would not result in inadequate emergency access. The project would comply with applicable Fire Department regulations, California Building Standards Code (Title 24), California Division of State Architect requirements, and National Fire Protection Association (NFPA) 820 "Standard for Fire Protection in Wastewater Treatment and Collection Facilities." The MCSD would also provide the local fire department with a full site plan for review, including location of all buildings, fences, ingress/egress points, or other features that might affect fire department access, with unobstructed fire lanes for access identified. All WWMF roadways would provide adequate turning radii for emergency services (fire trucks) and chemical deliveries. The review process, along with MCSD compliance with the applicable regulations and standards stated above, would ensure that adequate emergency access would be provided. The impact is less than significant.

f) Conflict with Adopted Policies, Plans, or Programs Regarding Public Transit, Bicycle, or Pedestrian Facilities, or Otherwise Decrease the Performance or Safety of Such Facilities – Less than Significant Impact

The Humboldt County General Plan Policy Document and McKAP are the guiding documents addressing bicycle, pedestrian and transit facilities in the project area and unincorporated community of McKinleyville. The project would not conflict with any of the policies or programs in these documents, nor adversely affect facilities for public transit, bicycles, or pedestrians. The impact is less than significant.

3.17 Utilities and Service Systems

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?			✓	
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?			✓	
c) Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?			✓	
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?			✓	
e) 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?			✓	
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?			✓	
g) Comply with federal, state, and local statutes and regulations related to solid waste?			✓	

3.17.1 Discussion

Wastewater

The existing WWMF consists of a collection system, wastewater treatment facility, and effluent disposal and land reclamation systems. Community wastewater is collected at five lift stations for pumping to the WWMF. The existing WWMF is a secondary treatment process that consists of three aerated ponds and one

stabilization pond followed by a two-stage treatment wetland. The average dry weather design flow of the treatment facility is 1.6 MGD and the wet weather design flow is 3.3 MGD.

Stormwater

See Section 3.9.1 “Stormwater” for a discussion of stormwater.

Water Supply

McKinleyville’s water distribution system and water treatment plant fall under the jurisdiction of the California Environmental Protection Agency (CALEPA) and the California Department of Health Services (CDHS).

MCSD currently relies on the Mad River as a resource for domestic and fire supply water. Water is purchased under long-term contract from the Humboldt Bay Municipal Water District (HBMWD). Drinking water that is supplied to MCSD is withdrawn from the bed of the Mad River through four radial-arm “Ramey collectors.”

Water is gravity-fed from HBMWD's facility on the Mad River to the Ramey Pump Station. Water is then pumped to MCSD's six storage tanks from which it is gravity-fed to MCSD's customers. The total combined system storage capacity is 5.25 million gallons. The delivery system, from storage tanks to individual users, consists of about 84 miles of water mains (SHN 2011).

Solid Waste

Humboldt Sanitation provides residential and commercial refuse collection services in McKinleyville and surrounding communities such as Trinidad, Westhaven, Big Lagoon, and Orick.

According to the Humboldt County General Plan Update Conservation and Open Space Element (Humboldt County 2012), the county, through Humboldt Waste Management Authority (HWMA), has been trucking its solid waste approximately 175 miles to two out-of-county landfills. One third of this waste is shipped to Dry Creek landfill near Medford, Oregon under a long-term contract. The remaining two thirds of solid waste is hauled to the Anderson landfill located near Redding, California. Together these two landfills would allow the county to meet its landfill disposal needs over the next 20 years.

a) Exceed Applicable Wastewater Treatment Requirements – Less than Significant Impact

Implementation of the project would not exceed wastewater treatment requirements of the North Coast Regional Water Quality Control Board (NCRWQCB). One of the objectives of the project is to improve compliance with mandated discharge requirements. Within the NPDES discharge permit, the effluent quality criteria shall be specified, as determined by the NCRWQCB, based on receiving water guidelines and waste load allocations. During construction of the project, the MCSD’s construction contractor would obtain a NPDES permit from the NCRWQCB for the

construction activities, which would include filing a Notice of Intent and preparation of a SWPPP. The impact would be less than significant.

b) Require Construction or Expansion of New Water or Wastewater Facilities – Less than Significant Impact

The project would not add additional treatment capacity to the existing WWMF and WWMF improvements would be primarily within the existing footprint of Pond 1A (Figures 1 and 2). Therefore, the potential impacts of the project on the environment would be less than significant.

c) Require Construction or Expansion of New Stormwater Facilities – Less than Significant Impact

The project site is in a developed area of McKinleyville, which is served by an existing stormwater collection and conveyance system. Development of the project is not anticipated to increase the volume or velocity of stormwater runoff off-site which would cause significant environmental effects (see Section 3.9.1); therefore, impacts would be less than significant.

d) Have Sufficient Water Supplies to Serve the Project – Less than Significant Impact

Water distribution infrastructure is already in place on and around the project site. The MCSD is responsible for supplying water within McKinleyville and for ensuring that the delivered water quality meets applicable California Department of Health Services standards for drinking water. The WWMF improvements themselves (i.e., new electrical building, headworks, clarifiers, etc.) would not require additional potable water for the new facility upgrades. Wastewater effluent is also reclaimed for irrigation of stormwater wetlands and a forested area at Hiller Park adjacent to the WWMF during the dry months of the year. Currently, plant water is supplied with potable community water. The proposed plant water system would utilize pumped final effluent thereby conserving potable water. The project's impact on MCSD's ability to provide the community of McKinleyville with a sufficient water supply would not be an issue and no new or expanded entitlements would be necessary. Furthermore, MCSD would comply with local, regional, and State water conservation policies and must follow standard BMPs to reduce water consumption; therefore, impacts on water supply would be less than significant.

e) Adequate Wastewater Capacity – Less than Significant Impact

Implementation of the project would not reduce or otherwise diminish the capacity of wastewater that is treated at the WWMF; therefore, impacts would be less than significant.

f) Have Sufficient Landfill Capacity – Less than Significant Impact

Construction of the WWMF improvements would generate a small volume of construction waste that would be hauled by the construction contractor to an approved disposal site. Construction would also generate solid waste from the

demolition of the existing motor control centers and control cabinet in the lab/control room. Waste would include construction materials remnants, replaced materials, and worker-generated trash and debris.

As Pond 1A is removed from service and Ponds 1B, 2 and 3 are used for effluent polishing ponds, the biosolids from the ponds needs to be processed and handled in the short term. Three alternatives for biosolids handling in the short term were analyzed as follows:

Short Term Biosolids Handling Alternatives

1. Contract dredging and dewatering biosolids from Pond 1A followed by off-site disposal.
2. Contract dredging and dewatering biosolids from Ponds 1B, 2 and 3 followed by off-site disposal.
3. Contract dredging biosolids from Ponds 1B, 2 and 3 and transferring the biosolids to a new Biosolids Storage Basin.

Land application is also an alternative for off-site disposal of biosolids. The closest known land application site is approximately 250 miles from MCSD's facility. It is assumed that a potential land application site may be found within 50 miles of the WWMF which would accept Class B Biosolids. It should be noted that some farms requires a minimum number of years of contract and do not provide hauling services. MCSD may be required to haul the biosolids or hire a Contractor to perform this work. It is assumed the MCSD would have to provide a minimum of three months' worth of biosolids storage at the WWMF in the event of upset or land application operational issues, such as bad weather, that could prevent land application.

Two alternatives for handling the WAS which would be produced from the new extended aeration system over the long term were analyzed as follows:

Long Term Biosolids Handling Alternatives

1. Mechanical dewatering of WAS followed by off-site disposal.
2. Storage of WAS in a new Biosolids Storage Basin followed by periodic contract dredging, dewatering, and off-site disposal.

Dewatering would allow the biosolids to meet the minimum solids content of 16 percent to pass the paint filter test (as described in EPA Publication SW-486 Method 9095) (EPA 2004), which is required for off-site disposal at a landfill. Dewatering would also reduce the volume of biosolids hauled significantly.

The design plan prepared by Kennedy/Jenks Consultants (2014) states that Anderson Landfill, Inc is located 155 miles from MCSD's facility in Anderson, California. The landfill accepts biosolids from wastewater treatment facilities. Final design and cost would dictate the short-and long-term method for biosolids handling, which would either be off-site disposal at a landfill, storage, or land application.

This would be a less than significant impact on landfill capacity with the implementation of, and adherence to, federal, State, and local statutes and regulations related to solid waste.

g) Comply with Statutes and Regulations Related to Solid Waste – Less than Significant Impact

During construction and operation of the project, the MCSD must comply with all county, and State solid waste diversion, reduction, and recycling mandates, including compliance with the Humboldt County Integrated Waste Management Plan; therefore, impacts would be less than significant.

3.18 Mandatory Findings of Significance

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporation	Less-Than-Significant Impact	No Impact
Would the project:				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?		✓		
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?			✓	
c) Does the project have environmental effects which would cause substantial adverse effects on human beings, either directly or indirectly?		✓		

3.18.1 Discussion

a, c) Degrade Environmental Quality or Adversely Affect Human Beings – Less than Significant with Mitigation

Because of the urbanized nature of the project site and surrounding land uses, and with implementation of the Environmental Protection Actions and Mitigation Measures presented herein, the project as a whole does not have the potential to significantly degrade the quality of the environment, including air quality, fish or wildlife species or their habitat, plant or animal communities, important examples of the major periods of California history or prehistory, geologic resources, hazards, water resources, land use compatibility, noise, traffic movement, or other adverse effects, directly or indirectly, on human beings.

b) Cumulatively-Considerable Impacts – Less than Significant Impact

The project's individual impacts would not add appreciably to any existing or foreseeable future significant cumulative impact, such as visual quality, historic resources, traffic impacts, or air quality degradation. Incremental impacts, if any, would be small and undetectable. As reported throughout this document, cumulative impacts to which this project would contribute would be mitigated to a less than significant level.

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Appendices

Appendix A – Geotechnical Report

LACO Geotechnical Report for the McKinleyville Wastewater Management Facility Improvements Project.

Geotechnical Report

McKinleyville Wastewater Management Facility Improvements
Assessor's Parcel Number 510-271-015

September 11, 2013

Prepared For:
Kennedy/Jenks Consultants, Inc.

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Geotechnical Report

McKinleyville Wastewater Management Facility
Assessor's Parcel Number 510-271-015

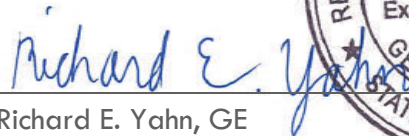
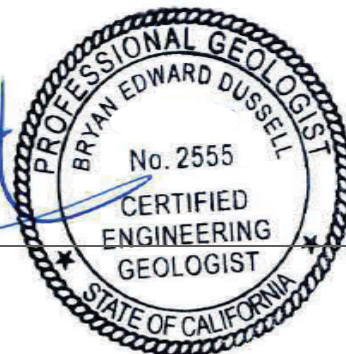
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Figure 2	Site Map
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APPENDIX 1

ASFE Brochure

APPENDIX 2

Boring Logs

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Laboratory Test Results

APPENDIX 4

Liquefaction Analysis

1.0 INTRODUCTION/PROJECT DESCRIPTION

This report presents the results of the LACO Associates (LACO) geotechnical exploration conducted to support design and construction of proposed improvements to the McKinleyville Wastewater Management Facility (WWMF) located at Assessor's Parcel Number 510-271-015 (see Figure 1, Location and Geologic Map). Based on previous construction drawings provided to us by the McKinleyville Community Services District (MCSD) and prepared by Winzler & Kelly Consulting Engineers (1982), the existing WWMF generally consists of a Control Building, Headworks, and Chlorine Contact Basin Structures. The existing structures are constructed on approximately 10 feet of fill material at an approximate current exterior ground surface elevation of 67 feet, North America Vertical Datum, 1988 (NAVD88). Additionally, existing Ponds 1A through 4 were constructed by cut and fill earthwork operations resulting in the same approximate 67-foot elevation at the top of the pond embankments, side slopes at gradients of approximately 2.5H:1V (horizontal to vertical), and pond bottom elevations as deep as approximately 54 feet (NAVD 88) According to the design team, the thickness of sludge that has accumulated in the ponds since construction varies from less than a foot to approximately 7 feet thick.

In general, the proposed improvements will alter Ponds 1A and 1B to provide space for:

- Aeration Basins 1 and 2, approximately 16 feet-deep with 2H:1V earth embankment slopes and lined with two layers of HDPE
- Secondary Clarifiers 1 and 2, consisting of reinforced concrete structures approximately 20 to 24 feet-deep and 50 feet-diameter
- A Blower, Electrical, Maintenance Building constructed on perimeter footings with a concrete slab-on-grade floor
- New Headworks with reinforced concrete walls and floors, and grade change of no more than approximately 4 feet
- Storage Tank and Metering Systems for Methanol and Calcium Hydroxide
- A Mixed Liquor Flow Distribution Structure
- A Biosolids Storage Basin
- Effluent Storage Pond 1A and 1B
- An Emergency Generator

Future improvements will include two additional Secondary Clarifiers, a UV Disinfection Structure, and a Filters Structure. The location and configuration of current planned and future improvements are shown on Figure 2, Site Map. The area of planned improvements shown on Figure 2 is hereafter referred to in this report as the Site. Included in this report is an assessment of the potential geologic hazards associated within the Site and recommendations to mitigate the potential effects of such hazards.

1.1 Scope of Services

LACO was retained to explore the Site; characterize subsurface soil conditions; assess potential geologic hazards; provide geotechnical-related recommendations for design and construction of the proposed improvements; and prepare this report.

LACO's scope of services was limited to the following:

- Review of existing published geologic maps pertinent to the Site, and readily available unpublished consultant environmental and geologic reports to be provided by the CLIENT.
- Performance of a field exploration program including the installation of five (5) geotechnical borings with a rotary hollow stem auger (HSA) drilling rig to a maximum depth of 50 feet below existing grade. Standard Penetration Testing was conducted at regular intervals, and disturbed and undisturbed soil samples were collected at regular and targeted intervals. Monitoring wells were constructed in two of the geotechnical borings to allow for depth to groundwater measurements to be collected by MCSD staff during the following wet season.
- Performance of a laboratory testing program used to evaluate selected soil samples with respect to strength, compressibility, density and moisture content, grain size, and plasticity.
- Preparation of this Geotechnical Report, which documents the following:
 - Geologic and seismic setting
 - Surface, subsoil, and groundwater conditions
 - Potential geologic hazards and seismic design criteria in accordance with ASCE-7 Standard, minimum design loads for buildings and other structures (site-specific seismic design response spectra is not included as part of this scope).
 - Extent of existing fill soils
 - Conditions of areas to receive fill
 - Ground improvements and mitigation measures to minimize the effects of adverse subsurface conditions
 - Requirements of proposed fill materials
 - Earthwork and grading requirements
 - Estimated structural settlements
 - Active and passive lateral earth pressures
 - Construction shoring and dewatering considerations
 - Foundation design recommendations for shallow spread and continuous footings, mat foundations, and concrete slabs-on-grade
 - Soil corrosivity

The scope of LACO's services did not include an environmental assessment for the presence or absence of any hazardous or toxic materials. Although we have explored subsurface conditions as part of our services, we have not conducted any analytical laboratory testing of samples for the presence of hazardous or toxic materials.

1.2 Location

The Site is located near the center of Section 6, Township 6 North, Range 1 East, Humboldt Baseline and Meridian, of the United States Geological Survey (USGS) Arcata North 7.5-Minute Series Topographic Quadrangle (Figure 1, Location and Geologic Map). Pertinent project location information is listed in Table 1.

Table 1 - Project Location Information

Latitude	40.9454 North
Longitude	-124.1226 West
USGS 7.5-minute quadrangle	Arcata North
Assessor's Parcel Number	510-271-015

*Latitude and longitude are based on coordinates provided by Humboldt
County Planning and Building GIS Portal for the Site centroid

1.3 Previous Geotechnical Exploration

In 1981, Moore and Taber performed a geotechnical exploration at the Site to support design and construction of the existing WWMF (Moore and Taber 1981). Their exploration included 12 geotechnical borings and 28 test pits extended to depths ranging from approximately 9 to 45 feet below the original ground surface. LACO has reviewed the field data from this previous exploration and, where applicable, has incorporated the findings in our current characterization of the subsurface conditions at the Site.

2.0 LIMITATIONS

This report has been prepared for the exclusive use of Kennedy/Jenks Consultants, Inc. (Client), their contractors and sub-consultants, and appropriate public authorities for specific application to development of the proposed project. LACO has endeavored to comply with generally accepted geotechnical engineering standards of care common to the local area. LACO makes no other warranty, express or implied. A brochure prepared by ASFE/The Geoprofessional Business Association (ASFE) has been included in Appendix 1 of this report. We recommend that all individuals reading this report also read this brochure.

The findings, analyses, and recommendations contained in this report are based on data obtained from subsurface explorations. The methods used indicate subsurface conditions only at specific locations where samples were obtained, only at the time they were obtained, and only to the depths penetrated. Samples cannot always be relied upon to accurately reflect stratigraphic variations that commonly exist between sampling locations, nor do they necessarily represent conditions at any other time. Results of analysis of samples obtained during this project will be retained on file in our office. Unless directed otherwise by our Client, collected samples will be discarded after 30 days following the issuance of this report.

The recommendations included in this report are also based, in part, on assumptions about subsurface conditions that may only be observed and/or tested during subsequent project earthwork. Accordingly, the validity of these recommendations is contingent upon LACO's review of the subsurface conditions exposed during construction to check that they are consistent with those characterized in this report. Upon request, we can discuss the extent of (and fee for) observations and tests required to check the validity of our recommendations.

Do not apply any of this report's findings, conclusions, or recommendations if the design, nature, or location of the project is changed. If changes are contemplated, LACO should be consulted to review their impact on the applicability of the findings, conclusions, or recommendations contained in this report. LACO will not be responsible for any claims, damages, or liability associated with any other party's interpretation of the subsurface data or reuse of this report for other projects or at other locations without LACO's express written authorization.

3.0 FIELD EXPLORATION AND LABORATORY TESTING

3.1 Field Exploration Program

To assess the in-situ soil conditions at the Site, LACO performed an exploration of the subsurface conditions on May 2 and 3, 2013, by logging and sampling five geotechnical borings (labeled B1 through B5) at the

approximate locations shown on Figure 2. Geotechnical Borings B1 through B5 were installed with a DR7KTrack track-mounted drill rig fitted with 8-inch-diameter, hollow-stem augers and an automatic safety hammer. Soil samples were collected with standard 2-inch (outside) diameter Standard Penetration Test (SPT) or Modified California (MC) samplers. SPT or MC (unconverted) blow counts are recorded on the boring logs included in Appendix 2 of this report. Borings B1 through B5 were advanced to depths ranging from 20 to 50 feet below adjacent existing grades. Monitoring wells for measuring hydraulic head were installed in Borings B1 and B3 after completion of drilling. The monitoring wells in Borings B1 and B3 extend to depths of 23 and 25 feet below the adjacent existing grades, respectively. Monitoring well details are included on the boring logs (Appendix 2).

Borings were logged in the field, in general accordance with the Unified Soil Classification System (USCS) and ASTM D2488 (Visual-Manual Procedure), by a LACO Assistant Engineer under the direction of a LACO Certified Engineering Geologist. Upon their completion, borings were backfilled with sand pack, bentonite, and neat cement to approximately match adjacent existing grades.

3.2 Laboratory Testing

Undisturbed and disturbed soil samples collected during the field exploration were submitted to both LACO's materials testing laboratory and a subcontracted laboratory for analysis. The laboratory analysis was performed to determine pertinent index properties of the soils encountered during the field exploration. The laboratory tests conducted for this exploration included:

- Particle Size Analysis – Finer than #200 (ASTM 1140)
- In-Place Density and Moisture Content (ASTM D2216 and D2937)
- Direct Shear (ASTM D-3080)
- Maximum Density of Soils (ASTM D-1557)
- Corrosivity of Soils

Laboratory test results are included as Appendix 3 and are summarized in Table 2.

Table 2 - Laboratory Test Results

Boring	Depth	USCS Soil Type	ASTM D-1140	ASTM D-1557		ASTM D-2216/2937		ASTM D-3080	
			Fines Content (%)	Maximum Density (pcf)*	Optimum M.C. (%)	Dry Density (pcf)	M.C. (%)	Friction Angle (degrees)	Cohesion (psf)**
B1	5	Fill	19.17	-	-	-	-	-	-
	30	SW	2.85	-	-	-	-	-	-
	40	SW-SM	11.63	-	-	-	-	-	-
B2	10	Fill	-	-	-	88.4	27.9	-	-
B5	16	SC	-	-	-	-	-	36.8	1028
Composite (B1-B3)	0 - 15	Fill	-	122.0	12.0	-	-	-	-

* pcf = pounds per cubic foot

**psf = pounds per square foot

LACO will archive the soil samples collected for this project for 30 days following the issuance of this report. Unless directed otherwise by our Client, all samples will be discarded after the 30 day archive period.

4.0 SITE AND SUBSURFACE CONDITIONS

4.1 Topography and Site Conditions

The Site is currently developed with the existing McKinleyville WWMF, which consists of six wastewater effluent treatment ponds and associated treatment facilities. The elevation of the Site is approximately 50 to 65 feet above mean sea level based on the North American Vertical Datum of 1988 (NAVD 88). The surface of the surrounding native slopes is low gradient (generally sloping less than 5%).

4.2 Geologic Setting

The Site is located within the northern Coast Ranges Geologic Province, a seismically active region in which large earthquakes may be expected to occur within the next 50 years. Surface topography in the vicinity is characterized by a broad, gently sloping, uplifted coastal plain surface. Published mapping (CDMG 1984; McLaughlin et al 2000) indicates the soils underlying the Site are Quaternary marine terrace deposits consisting of poorly to moderately consolidated deposits of marine silts, sands, and gravels.

The McKinleyville area is characterized by a series of uplifted Pleistocene marine terraces that increase in age and elevation to the east. The terraces are deformed by a series of northwest-striking, northeast-dipping, low-angle thrust faults that comprise the Mad River fault zone. Faults within this zone include the Mad River and McKinleyville faults. These faults make up a portion of the on-land Cascadia subduction zone fold and thrust belt. Localized areas of ground surface rupture and surface warping are the result of repeated slip along these structures.

4.3 Seismic Setting

The regional tectonic framework is controlled by the Cascadia Subduction Zone (CSZ) wherein oceanic crust of the Juan de Fuca and Gorda plates are being actively subducted beneath the leading edge of the North American plate. The CSZ in its entirety extends from the Mendocino triple junction to British Columbia. Plate convergence along the Gorda segment of the CSZ is occurring at a rate of approximately 30 to 40 millimeters per year (mm/yr) (Heaton & Kanamori 1984). Rupture along the entire CSZ boundary may produce an earthquake with a maximum moment magnitude (M_w) of 9.0 or greater (Satake 2003).

Upper plate crustal deformation associated with the subduction of the Gorda plate is expressed as a 90-kilometer (km) wide fold and thrust belt that comprises the accretionary complex along the North American plate margin (Carver 1987). Faults associated with the offshore and onshore portions of the CSZ fold and thrust belt include the Little Salmon fault and Mad River fault zone.

Based on the record of historical earthquakes (approximately 150 years), faults within the plate boundary zone and internally deforming Gorda plate have produced numerous small magnitude and several moderate to large (i.e. magnitude greater than 6) earthquakes affecting the local area. Several active regional seismic sources in addition to the CSZ and Mad River faults are proximal to the Site and have the potential to produce strong ground motions. These seismic sources include the following:

- The northern segment of the San Andreas transform fault that represents the boundary between the stable North American Plate and the northwest-migrating Pacific Plate;
- The Mendocino fault, an offshore, high-angle, east-west-trending, right-lateral, strike-slip fault that forms the boundary between the Gorda and Pacific plates; and
- Faults within the internally-deforming Gorda Plate consisting of high-angle, northeast-trending, left-lateral, strike-slip faults.

A search of faults with Late Quaternary activity was performed using the program EQFAULT (v. 2.01) and a digitized data file of the California Division of Mines and Geology Fault Activity Map of California (Jennings 1994). The search found 15 faults within 60 miles (100 kilometers) of the Site. Of the identified active faults, those nearest the Site are summarized in Table 3.

Table 3 – Local Active Faults

Fault System	Distance from Site (Kilometers)	Direction from Site	Maximum Moment Magnitude	Peak Ground Acceleration (g)
Mad River	<1	East	7.1	0.87
Fickle Hill	1	South	6.9	0.82
Little Salmon	14	South	7.1	0.26
Cascadia Subduction Zone	36	West	9.0	0.18

Earthquake magnitudes are expressed in terms of the moment magnitude scale (M_w) and were obtained from *Tables of California Fault Parameters* in Peterson and others (1996), Cao and others (2003), and from EQFAULT. Peak ground accelerations are average values estimated for the maximum moment magnitude earthquake, using attenuation relationships developed by Boore and others (1997), Campbell (1993 and 1997), and Sadigh and others (1997) for a site underlain in the upper 30 meters by stiff alluvial soils.

4.3.1 Mad River Fault

The Site is situated within the Mad River fault zone. The Mad River fault zone is comprised of northwest-striking, northeast-dipping, low-angle thrust faults. As mapped by the State (CDMG 1984), a splay of the Mad River fault projects directly through the Site (Figure 3, Alquist-Priolo Zone Map). However, the mapped splay is not considered active by the State and we did not observe evidence in the field to suggest otherwise. The closest active splay of the Mad River fault is located approximately 700 feet easterly of the project area. Trench-based fault studies on the active splay of the Mad River fault have identified at least six rupture events along the fault within the last 83,000 years with the most recent occurring within the last 10,000 years (Carver and Burke 1988). Each event is estimated to have resulted in several meters of displacement.

5.0 SUBSURFACE CONDITIONS

5.1 Site Soils

Review of both subsurface exploration results previously conducted on the Site (Moore and Taber 1981) and the subsurface data obtained during our current exploration indicate that the native soils underlying the Site primarily consist of loose to medium-dense, dark-brown silty sand (SM) underlain by medium-dense to dense, gray-brown poorly to well-graded marine terrace sands (SP and SW). In the areas currently explored, native soils were generally encountered below an approximately 14 to 19- foot-thick layer of fill.

Fill soils encountered are typically composed of mixed materials consisting of loose to medium-dense sand with silt and clay. The fill soils were placed in 1983 during the construction of the WWMF; the origin and relative percent compaction of the fill material is unknown. Based on SPT blow counts, the compaction of the fill generally appears to have resulted in a material as dense, or denser, than the upper 5 to 10 feet of native soil. Given the age and apparent density as documented through SPT blow counts, we judge that the existing fill material (where explored) is suitable to support the anticipated lightly loaded improvements.

Detailed descriptions of the soils encountered in the geotechnical borings drilled for this exploration are provided on the Logs of Borings B1 through B5 included as Appendix 2.

5.2 Groundwater Conditions

Groundwater was encountered in Borings B1, B3, and B4 at depths ranging from 25 to 28 feet below the existing grade (39.5 to 42.5 feet in elevation, NAVD88) during our field exploration (May 2 and 3, 2013). Groundwater elevations recorded by Moore and Taber (1981) are generally consistent with the elevations encountered during our field exploration.

6.0 GEOLOGIC AND SOIL HAZARDS ASSESSMENT

Potential geologic and soil hazards assessed for the Site include seismic ground shaking; surface fault rupture; liquefaction and related phenomena; settlement; slope instability; high groundwater; flooding; tsunamis; and swelling or shrinking soils. The assessments for these potential hazards are presented below.

6.1 Seismic Ground Shaking

As previously discussed, the Site is situated within a seismically-active area and multiple seismic sources capable of producing moderate to strong ground motions exist in the vicinity of the Site. The upper-bound earthquake considered likely to occur along the Mad River fault zone has an estimated maximum moment magnitude of 7.1 (International Conference of Building Officials [ICBO] - CDMG 1998). Ground accelerations of at least 0.60 g to 0.70 g (60 to 70 percent of the force of gravity), or more, may be expected to occur on this site as a result of the regional design basis earthquake (Petersen et al 1999; CGS, 2003).

Given the proximity of active faults within the Mad River fault zone and the offshore CSZ, the risk of ground shaking at the Site is high.

6.2 Surface Fault Rupture

The Site is not located within an Alquist-Priolo earthquake fault zone (CDMG 1983). The closest active splay of the Mad River fault is located approximately 700 feet easterly of the Site; as previously noted, a splay of the Mad River fault, which is not considered active, projects through the Site. The basis for the mapping of the inactive splay projecting through the Site is unknown and there is no published evidence that the fault splay is active.

Given that the Site is located approximately 700 feet westerly of the identified active trace of the Mad River fault and the splay of the fault identified within the project area is considered inactive, we judge that the risk of fault rupture to occur within the Site is low. However, we cannot preclude the possibility that future seismic events within the Mad River fault zone will result in reactivation of the inactive fault. Performing a detailed fault hazard analysis of the inactive splay of the Mad River fault is beyond the scope of this project.

6.3 Liquefaction

6.3.1 General

Liquefaction is the loss of soil strength resulting in fluid mobility through the soil, which typically occurs when uniformly-sized, loose, saturated sands or silts are subject to repeated shaking in areas where the groundwater is less than 50 feet below the ground surface (bgs). In addition to the necessary adverse soil and groundwater conditions, the ground acceleration must be high, and the duration of the shaking must be sufficient, for liquefaction to occur. Liquefaction of ground beneath or around structures commonly results in bearing capacity failure, settlement, flotation of structures below groundwater due to buoyancy forces, and lateral spreading. Lateral spreading is a potential hazard commonly associated with liquefaction where extensional ground cracking and settlement occur as a response to lateral migration of subsurface liquefiable material. These phenomena typically occur adjacent to slopes or channels.

6.3.2 Quantitative Analysis

A quantitative liquefaction analysis evaluates the Cyclic Stress Ratio (CSR) and Cyclic Resistance Ratio (CRR) of a soil, which is a comparison of the seismic driving force to the resistance provided by each soil layer. The CRR is divided by the CSR to find the Factor of Safety (FS), which is used to interpret the potential for the Site to liquefy. When the CSR exceeds the CRR ($FS < 1$), the soil is considered to have a high liquefaction potential.

Liquefaction, dynamic settlement, and lateral spread calculations for the Site were performed based on the Idriss and Boulanger Procedure (2008) and soil data obtained from Boring B1. The calculations assumed a magnitude 7.1 earthquake with a peak acceleration of 0.713g (S_{Ds} divided by 2.5).

The results of our liquefaction, dynamic settlement and lateral spread analyses are presented in Appendix 4 of this report, and summarized in Table 4.

Table 4 - Quantitative Liquefaction/Lateral Spread Results

Input	
Method	Idriss & Boulanger, 2008
Peak Ground Acceleration	0.713 g
Earthquake Magnitude	7.1 MW
Groundwater Depth	25 feet bgs
Results	
Potentially Liquefiable Layers	None
Dynamic Settlement	-
Lateral Spread	-

The results from our quantitative liquefaction analysis indicate that liquefaction is unlikely under the modeled conditions. These results are supported by published hazard maps (CDMG 1995).

Based on the result our quantitative liquefaction analysis and published hazard maps, we conclude that the potential for liquefaction to occur at the Site is negligible.

6.4 Settlement

Static settlement is the result of compressive deformation of soil beneath an applied load. The compressive deformation generally results from a reduction in voids within the soil. In dry or granular soils, the compression of the soil occurs relatively rapidly (immediate settlement). Conversely, the compressive deformation in soft, fine-grain soils usually occurs very slowly (consolidation settlement).

New settlement of the existing fill does not appear to be a significant concern based on both the SPT blow counts recorded during sampling of the test borings, and on the absence of appreciable detrimental movement observed in the existing +30-year-old structures supported in the fill at the Site. Settlement of new fill at the Site should not be significant provided it is placed and compacted in accordance with the recommendations presented in this report.

With the exception of an approximate 2- to 4-foot-thick layer of soft clay generally encountered just below the surface fill materials, the native soils encountered at the Site are generally dense (moderate to high SPT blow counts) and will not be prone to significant settlement due to an increase in load from new fill or structures. The soft clay layer is relatively thin and located approximately 14 feet below the current surface grade of the Site (~53 feet, NAVD88). At this depth, the clay layer should not experience an increase in load from planned structures supported at, or near, the current Site surface, nor from the deeper structures founded below this clay layer grade; thus significant new settlement of this clay layer appears unlikely.

6.5 Slope Instability/Landsliding

The Site is located on a low-gradient surface. According to a map prepared by Humboldt County Community Development Services (HCCDS 2004), the Site is located in an area considered to be of "Low Instability". The closest slopes are the coastal bluffs that descend into the Mad River, approximately 750 feet west of the Site. Therefore, based on this far distance from the Site, we judge the potential for slope instability to adversely affect the proposed improvements to be low.

6.6 High Groundwater

As previously presented (Section 5.2), groundwater was recorded at depths ranging from 25 to 28 feet below the adjacent ground surface (bgs) during our field exploration. Except for portions of the proposed clarifiers, which are founded as deep as possibly 25 feet bgs, we consider the risk of encountering groundwater during construction of the proposed improvements is low to negligible. At this time, where structures are constructed below an elevation of approximately 42 feet (NAVD 88), the risk appears to be moderate to high that groundwater may be encountered. If further evaluation of this risk is desired, hydraulic head in the monitoring wells installed as part of the exploration for this report can be recorded on a periodic basis.

6.7 Flooding

According to the Flood Insurance Rate Map, Map Number 0600600625B, effective July 9, 1982, the project area is located within an area designated as Zone C, or "areas of minimal flooding." Therefore, on the basis of this mapping, the risk of flooding to occur at the Site is considered low.

6.8 Tsunami

The most recent tsunami hazard maps published by the State of California Geological Survey (CGS 2009), indicate that the Site is not within a predicted tsunami inundation zone; therefore, the risk of tsunami inundation occurring at the Site is considered low.

6.9 Soil Swelling or Shrinkage Potential

Expansive soils represent a significant structural hazard to structures founded on them, especially where seasonal fluctuations in soil moisture occur at the foundation-bearing depth. The soils encountered at the Site during our field exploration consist primarily of granular fill soils with only occasional fine-grain silt and clay lenses, which appeared to have a low-expansive potential. In addition, detrimentally-expansive soils are not known to exist within the Quaternary marine terrace deposits located in the Site vicinity, nor are we familiar with detrimental expansive soil movement having occurred for any past project in the McKinleyville and/or nearby region. Based on the above, we conclude that the risk of expansive soils detrimentally affecting the proposed improvements at the Site is low.

6.10 Corrosion Potential

To evaluate the corrosion potential of the shallow soils within the proposed development area, a composite sample was tested for pH, electrical resistivity, chloride, and sulfate content.

The results of the corrosivity tests indicate that the tested soils have a resistivity of approximately 160,740 Ohm-cm, (saturated) chloride content of 10 mg/kg, sulfate content of 3 mg/kg, and a pH of approximately 7.4. Based on criteria established by Caltrans (Caltrans 2012), the shallow soils within the proposed development area are not considered corrosive.

7.0 DISCUSSION AND RECOMMENDATIONS

Based on the results of this exploration and evaluation, we conclude that the proposed improvements are feasible, provided the recommendations of this report are incorporated into the project design and construction. Further, we judge that the project will be subject to the following main engineering geologic/geotechnical considerations:

- Strong seismic ground shaking
- Potential differential settlement of variably dense old fill and/or native near-surface soils

Due to the inactive classification of the fault projecting onto the Site and the distance between the Site and the active splay of the Mad River fault, surface rupture and/or coseismic ground deformation associated with either the active or inactive splays of the fault are not considered constraints that will require specific design mitigation.

7.1 Foundation Support

Conceptual foundation plans were provided to LACO at the time this report was prepared, and generally consist of relatively conventional, shallow and deep spread footing and slab-on-grade foundation systems. As such, the following recommendations are suitable for the currently anticipated foundations bearing on either the mixed fill or deeper native soils encountered during our field exploration, or on new fill that is properly placed and compacted (earthwork recommendations are presented in Section 8.2).

The existing fill soils underlying the Site are composed of mixed materials, consisting of loose to medium-dense sand with silt and clay. Based on our experience with the recomacted strength of fill soils, and on the SPT blow counts of the deeper native soils, foundations can be designed using an allowable foundation bearing pressure of 2,000 pounds per square foot (psf) for dead plus long-term live loads. An increase in bearing pressure of one-third may be used when considering total loads including wind and/or seismic forces. All footing excavations should be reviewed by the project geotechnical engineer or their representative to check that exposed soils are firm and unyielding with suitable recommended bearing. If isolated soft native and/or loosely compacted fill soils are encountered, the excavations should be extended into the underlying firm soils.

Lateral load resistance may be developed in friction between the foundation bottom and the supporting subgrade soils. An allowable friction coefficient of 0.35 is considered applicable. An allowable passive pressure equal to an equivalent fluid weighing 350 pounds per cubic foot (pcf), and assuming a factor of safety of approximately 2, acting against the sides of foundations may also be used to resist lateral loads. Passive pressure should be neglected in the upper 1 foot of soil unless the adjacent soil surface is confined by concrete slabs or pavements. If friction and passive resistances are to be combined, reduce the lesser value by 50 percent.

Foundation concrete should be placed neat against a firm soil surface that is relatively free of loose, debris material, if possible. If backfill against formed footings is required, it should consist of a select fill material that is placed and compacted in accordance with the recommendations contained in this report.

7.2 Buried Retaining Walls

The planned buried walls are expected to be up to about 25 feet in height. The walls must be designed to resist lateral soil pressures, hydrostatic pressures and surcharge loads applied on the backfill side of the walls. For design of the walls, the following parameters may be assumed.

Buried "retaining" walls which will be restrained from movements at the top of the walls should be designed based on an at-rest soil pressure calculated using an equivalent fluid weight of 60 pcf for horizontal backfill and walls above the groundwater elevation, and 40 pcf for horizontal backfill and walls below the groundwater elevation. Additionally, a hydrostatic pressure of 62.4 pounds per cubic foot equivalent fluid weight should be applied to the portions of the buried walls below the groundwater elevation. Based on our exploratory borings, we estimate that the highest groundwater will be at approximately 25 feet (approximate elevation of 42 feet, NAVD88) below existing grade at the Site. Structures located below this elevation should be designed for both uplift and combined hydrostatic and saturated soil pressures. If groundwater elevations encountered during construction are different than noted herein, LACO should be consulted for additional recommendations regarding lateral forces on the walls.

For simulation of the effects of traffic loading, a uniform horizontal pressure of 120 psf may be applied on the top 10 feet of walls, and 60 psf below 10 feet below grade. For static surcharge loads, 50 percent of the total vertical loads should be applied as a uniform horizontal pressure on the top 10 feet of the walls and 25 percent below 10 feet below grade. For other surcharge loads, such as foundation loads, strip loads, etc., LACO should be consulted for specific design pressures. The pressures recommended above should be applied on a vertical plane starting from the bottom of the wall base extending up to the ground surface.

To simulate the effect of earthquake loading on the buried walls, the walls may be evaluated based on an active lateral soil pressure calculated using an equivalent fluid weight of 40 pcf for the portion of the walls above the groundwater elevation, and 30 pcf for the portion of the walls below the groundwater elevation. Additionally, a hydrostatic pressure of 62.4 pcf equivalent fluid weight should be applied to the portion of the walls below the groundwater elevation. Also, buried wall design should include a horizontal seismic surcharge line force of $23H^2$ pounds per lineal foot of wall. The resultant of the horizontal seismic surcharge line force should be applied at $H/3$ above the wall base, and the resultant of the horizontal seismic surcharge force should be applied at a height of $2H/3$ above the wall base. H is defined as the vertical height from the base of the wall to the ground surface above.

7.3 Moisture Control for Concrete Slab Foundations

Concrete slabs intended for habitable space should generally be underlain by at least 4 inches of clean, $\frac{3}{4}$ -inch (nominal diameter) gravel to act as a capillary moisture break. To reduce the possibility of moisture migration through the concrete floor, a 15-mil plastic membrane (vapor retarder) should be placed on the $\frac{3}{4}$ -inch, crushed gravel. To help protect the membrane against puncture during steel and concrete placement, and to aid in concrete curing, the membrane typically should be covered with 2 inches of clean sand. For tanks or non-moisture sensitive building slab floors, crushed rock is not required and the slab floors can be placed against firm native soil or structural fill material.

LACO's recommendation for a concrete slab moisture vapor barrier is not intended to eliminate potential slab moisture problems. Rather, the recommendation is intended to reduce the potential for moisture to permeate the concrete. Flooring suppliers and/or manufacturers should be consulted for more specific slab design and/or construction criteria where slab finishes require stringent moisture control.

7.4 Seismic Design Parameters

We recommend the proposed structures be designed and constructed to withstand seismic shaking as required by the California Building Code (CBC). Based on the Site conditions and the assessed liquefaction potential of the shallow soils, we have classified the Site as Site Class D, consisting of "stiff soil profile" (Section 1613.5.2, 2010 CBC). The design spectral response accelerations S_s , S_1 , F_a , F_v , S_{MS} , S_{M1} , S_{DS} , and S_{D1} were determined using the USGS seismic calculator software, "Seismic Hazard Curves, Response Parameter, Design Parameters: Seismic Hazard Curves and Uniform Hazard Response Spectra" (version 5.1.0a, February 10, 2011), and based on the American Society of Civil Engineers (ASCE) Standard 7-05, Minimum Design Loads for Buildings and Other Structures analysis option. Calculated values are presented in Table 5.

Table 5 - Summary of Seismic Design Factors

Site Class	F_a	F_v	S_s	S_1	S_{MS}	S_{M1}	S_{DS}	S_{D1}
D	1.0	1.5	2.674	1.048	2.674	1.572	1.783	1.048

*Latitude and longitude are 40.9454° North and -124.1226° West, respectively, based on coordinates provided by Humboldt County Planning and Building GIS Portal for the Site centroid.

These design spectral response accelerations are further defined as follows:

- F_a Short period coefficient to modify 0.2-second period of mapped spectral response accelerations for Site Class D.
- F_v Long period coefficient to modify 1.0-second period of mapped spectral response accelerations for Site Class D.
- S_s Mapped spectral response acceleration, 5 percent damped, at 0.2-second period for Site Class B (%g).
- S_1 Mapped spectral response acceleration, 5 percent damped, at 1.0-second period for Site Class B (%g).
- S_{MS} Maximum considered earthquake spectral response acceleration, 5 percent damped, at 0.2-second period for Site Class effects (%g).
- S_{M1} Maximum considered earthquake spectral response acceleration, 5 percent damped, at 1.0-second period for Site Class effects (%g).
- S_{DS} Design spectral response acceleration, 5 percent damped, at 0.2-second period (%g).
- S_{D1} Design spectral response acceleration, 5 percent damped, at 1.0-second period (%g).

8.0 EARTHWORK

The following sections of our report present both general and specific earthwork recommendations for the project, as needed. Recommendations for site and subgrade preparation, fill and backfill quality and compaction, and surface drainage control are included. An evaluation of the suitability of the native soils at the Site for use as a clay liner was not a part of our scope of services. In general, all soils classified as sand (boring log symbols SM, SC, SW, SP) will not likely be suitable for use as a clay liner due to an expected coefficient of permeability greater than $1(10)^{-6}$ when compacted to at least 90 percent relative compaction. The discontinuous and isolated, relatively thin layers of clay (boring log symbol CL) and/or the Mixed Fill at the Site may be suitable for use as a clay liner, but the quantity, uniformity, and permeability of this material should be confirmed through further exploration and/or testing depending on the actual grades and configurations of the planned structures. At a minimum, we anticipate any of the Site soils could be used as a clay liner if mixed with bentonite in the range of 3 to 5 percent (by weight). The actual percentage of bentonite required should be confirmed through additional evaluation and testing.

8.1 Site Clearing

At the location of new fill and/or new foundations, existing vegetation (if any) and/or asphalt concrete, concrete, or sludge debris materials (where encountered) should be stripped, grubbed, and/or otherwise removed. All earthwork including, but not limited to, site clearing, grubbing, and stripping should generally be conducted during dry-weather conditions, where feasible. If wet-weather site preparation is necessary, additional excavation may be needed where rain-softened, yielding soils are present under the construction equipment used. Old construction debris materials should be suitably disposed of; sludge containing organic-laden material may be stockpiled for future use as compost, if desired.

8.2 Subgrade Preparation

Following site clearing, the exposed subgrade soils should be reviewed and approved by the project Geotechnical Engineer or his designated representative prior to placement of new fill. The project Geotechnical Engineer may require overexcavation, and/or scarification and recompaction depending on the density and quality of the soils exposed. Although the actual need for overexcavation and/or scarification and recompaction is unknown at this time, unit prices for this work, and additional compacted fill, could be obtained during bidding for approval of extra work, if needed.

Unless directed otherwise by the project Geotechnical Engineer, subgrade soils to receive fill should generally be "firm and unyielding" under proof rolling with conventional earthmoving equipment such as a fully-loaded, 10-yard dump truck with a minimum rear-axle load of 8 tons, or equivalent.

8.3 Structural Fill

Where planned, structural fill used to support foundations, exterior slabs/sidewalks, and pavements should be composed of a low-expansion-potential material, and be free of organic debris and other deleterious matter. Structural fills should be placed on a prepared grade as specified above. The material should not contain rocks larger than 3 inches in greatest dimension, or more than 15 percent larger than 2 inches. Additionally, the material should meet the following specifications:

Plasticity Index:	15% or less
Liquid Limit:	40% or less
Percent passing No. 200 sieve:	50 maximum, 5 minimum

In general, the granular materials encountered on-site are judged to meet the above requirements for reuse as structural fill.

8.4 Compaction Standard

Unless directed otherwise by the project Geotechnical Engineer or their representative, structural fill should be compacted to a minimum of 90 percent of the maximum dry density of the same soil as determined by the ASTM D1557 method. A qualified Field Technician should be present to observe fill placement operations and to perform field density tests (per ASTM D6938) at random locations throughout the fill to check that the specified relative compaction is being achieved by the contractor. The structural fill should be placed on a prepared grade as specified above in loose lifts less than approximately 8 inches thick.

8.5 Cut and Fill Slopes

Improvement plans include permanent, earthen slopes overlain by HDPE for the aeration basins. For the new fill slopes of the aeration basin, we currently recommend a gradient no steeper than 2H:1V. In the event that other un-retained cut and/or fill slopes greater than 3 feet high are required, they should generally be constructed in accordance with the requirements of the Humboldt County Grading Ordinance and the current California Building Code.

8.6 Temporary Excavations

Excavations of up to 25 feet below adjacent grade are currently anticipated for construction of the proposed improvements. We anticipate that the excavations may be constructed with vertical sidewalls, which will need to be shored and braced. The excavations through the near-surface soils can likely be accomplished with relatively conventional excavation equipment.

All excavations should be constructed in accordance with OSHA and Cal-OSHA Safety Standards. Safety in and around the excavations is the responsibility of the underground contractors. All vertical sidewalls of the excavation should be shored and braced. The excavations should be observed by a representative of LACO. Dewatering of the excavations deeper than approximately 25 feet bgs (42 feet, NAVD88) will likely be required. It is the responsibility of the contractor to maintain safe and stable excavations, and to design, install, and maintain proper shoring during construction of the improvements.

In general, construction material or equipment should not be allowed to surcharge the excavations. Material and equipment, including vehicles and other temporary equipment, located at grade above the excavations should not be allowed closer to the excavations than an imaginary line extending up from the bottom of the excavations at a 1:1 (H:V) slope. Alternatively, the shoring and bracing design should include the lateral surcharge forces to allow materials and/or equipment to be located adjacent to the top of excavations. Any existing structure foundations closer to the excavation than an imaginary line extending up from the bottom of the excavations at a 1:1 (H:V) slope, will require underpinning. If underpinning is needed, LACO is available to provide additional recommendations. Underpinning would likely consist of a combination of helical screw anchors extending to firm soil and a grade beam to support the existing

structures. Geotechnical design information for shoring and bracing of vertical cuts is presented in Section 8.7 of this report.

The excavations should have ladders in sufficient number for emergency egress. The excavations should be inspected for safety daily by a competent qualified person. A competent qualified person is defined as a person who can evaluate the safety of the excavation and has the authority to stop work and have the excavation evacuated if an unsafe condition arises.

Surface water should be directed away from open excavations, and water should not be allowed to accumulate in the bottoms of excavations.

Before construction, underground utilities at the Site should be located. Provisions for supporting such utilities during construction of the improvements may be needed.

8.7 Shoring

Design, installation, and maintenance of the shoring and bracing systems are the responsibility of the shoring contractor. The final shoring and bracing designs should be reviewed by the project geotechnical engineer and the project structural engineer. If acceptable to the shoring contractor and structural engineer, the shoring can be left in-place after construction of the improvements.

Internal bracing should be installed as needed to resist lateral movement of the shoring. In order to reduce movements of shoring, the designer and installers should provide for a uniform and timely mobilization of soil pressures. In this way, large deflections can be reduced during and after shoring installation. Shoring and bracing should be designed based on the following design values for temporary shoring and bracing:

- Use a uniform soil pressure of 30H psf of excavation face for soil located above groundwater, and 20H psf of excavation face for buoyant soil located below groundwater, where H is the total height of the face of the shoring. Below groundwater, a hydrostatic surcharge of 62.4 pcf (effective fluid weight) should be added to the uniform buoyant soil pressure. For simulation of surcharge loads behind the shoring, such as vehicle loads or storage loads, 50 percent of the vertical surcharge load should be applied as a uniform horizontal pressure on the upper 10 feet of the shoring. For depths greater than 10 feet below existing grade, 25 percent of the vertical surcharge load should be applied as a uniform horizontal pressure on the shoring.

Shoring methods and operations should conform to the current Cal-OSHA requirements for worker safety, and should take into account soil and bedrock conditions as they are encountered during construction. These recommendations assume minimal equipment vibration and adequate setbacks of excavated materials and construction equipment from the top of excavations. We recommend that the minimum setback distances given above in Section 8.6 of this report be used, or that the surcharge loads given in Section 8.6 be incorporated in the shoring design. The proximity to existing pavements, structures, and underground utilities adjacent to the planned structure should also be considered when designing the shoring systems. We further recommend that close monitoring of the safety of the shoring be provided by the contractor. Unit costs should be obtained for cement slurry for use in filling voids that may occur behind the shoring during installation (or removal), or for possible "dental work" at the base of the excavation. The shoring design should be reviewed by the project Geotechnical Engineer prior to construction.

8.8 Dewatering

Because groundwater was encountered at depths of 25 to 28 feet in our borings, and secondary clarifier excavations are anticipated to be on the order of 25 feet-deep (42 feet, NAVD88), dewatering will likely be needed during construction. Sump pumps, with gravel working pads, should be installed to keep the excavations dry during construction. High groundwater is not expected to be a concern during the lifetime of the structures, and a permanent dewatering system is not recommended. Design, installation, and maintenance of a temporary construction dewatering system are the responsibility of the contractor. If requested, a construction dewatering plan can be prepared by LACO under a separate scope.

8.9 Utility Trenches

Where trenches for utilities will closely parallel a planned foundation, and the trench bottom extends below a two horizontal to one vertical (2H:1V) plane, projected outward and downward from the footing, concrete slurry (2-sack, minimum) should be utilized to backfill that portion of the trench below this plane. The use of slurry backfill is not required where a narrow trench crosses a footing at, or near, a right angle.

8.10 Drainage

The Site should generally be graded to provide positive drainage away from foundations. A minimum gradient of three percent should be maintained for all hardscaped areas. A 5 percent gradient should be maintained for landscaped areas within 10 feet of a structure. Grading or landscaping design and construction should not allow water to pond on the Site, nor to migrate beneath any structure. Runoff from hardscaped areas, roofs, exterior slabs, and other impermeable surfaces should generally be contained, controlled, and collected in a tight-line pipe that outlets into the Site storm drainage system.

9.0 CONSULTATION, OBSERVATION, AND TESTING

To check for conformance with the recommendations contained in this report, and to verify that the assumptions made in the preparation of this report are valid, we recommend that LACO be retained to provide the following post-report and construction services:

- Review the foundation and grading plans for conformance with the recommendations presented herein.
- Monitor site grading and inspect exposed grades prior to placement of structural fills and/or pavement sections.
- Observe foundation excavations prior to placement of any forms or reinforcing steel.
- Monitor the placement of structural fill, and test all structural fill to check that the recommended relative compaction is achieved.

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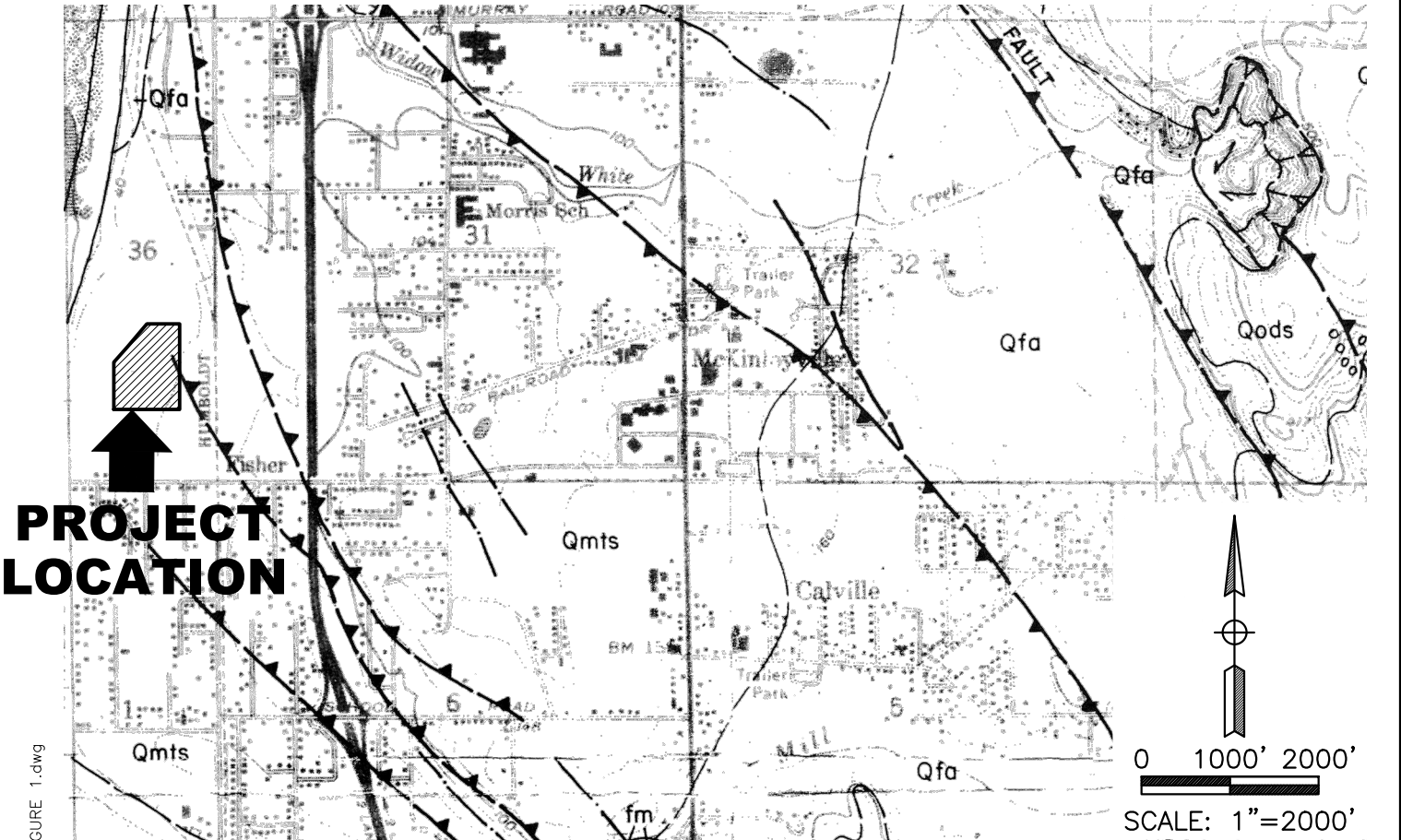
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P:\7600\7624 Kennedy Jenks Consultants\7624.00 MCSD WWTP\08 Geology\7624 00 McKinleyville WWMF Final.docx

FIGURES

- | | |
|-----------------|----------------------------------|
| Figure 1 | Location and Geologic Map |
| Figure 2 | Site Map |
| Figure 3 | Alquist-Priolo Zone Map |

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TRANSLATIONAL/ROTATIONAL SLIDE: relatively cohesive slide mass with a failure plane that is deep-seated in comparison to that of a debris slide of similar areal extent; sense of motion along slide plane is linear in a translational slide and arcuate or "rotational" in a rotational slide; complex versions with rotational heads and translational movement or earthflows downslope are common; translational movement along a planar joint or bedding discontinuity may be referred to as a block glide; indicates scarp, indicates direction of movement; dashed where dormant, queried where uncertain.



DEBRIS SLIDE: unconsolidated rock, colluvium, and soil that has moved slowly to rapidly downslope along a relatively steep (generally greater than 65 percent), shallow translational failure plane; forms steep, unvegetated scars in the head region and irregular hummocky deposits (when present) in the toe region; scars likely to ravel and remain unvegetated for many years; revegetated scars recognized by steep, even-faceted slope and light-bulb shape; includes scarp and slide deposits; solid where active, dashed where dormant.



DEBRIS SLIDE SLOPE: geomorphic feature characterized by steep (generally greater than 65 percent), usually well vegetated slopes that have been sculpted by numerous debris slide events; vegetated soils and colluvium above shallow soil/bedrock interface may be disrupted by active debris slides or bedrock exposed by former debris sliding; slopes near angle of repose may be relatively stable except where weak bedding planes and extensive bedrock joints and fractures parallel slope.

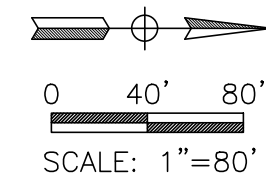
- **ACTIVE SLIDE:** too small to delineate at this scale.



DISRUPTED GROUND: irregular ground surface caused by complex landliding processes resulting in features that are indistinguishable or too small to delineate individually at this scale; also may include areas affected by downslope creep, expansive soils, and/or gully erosion; boundaries usually are indistinct.

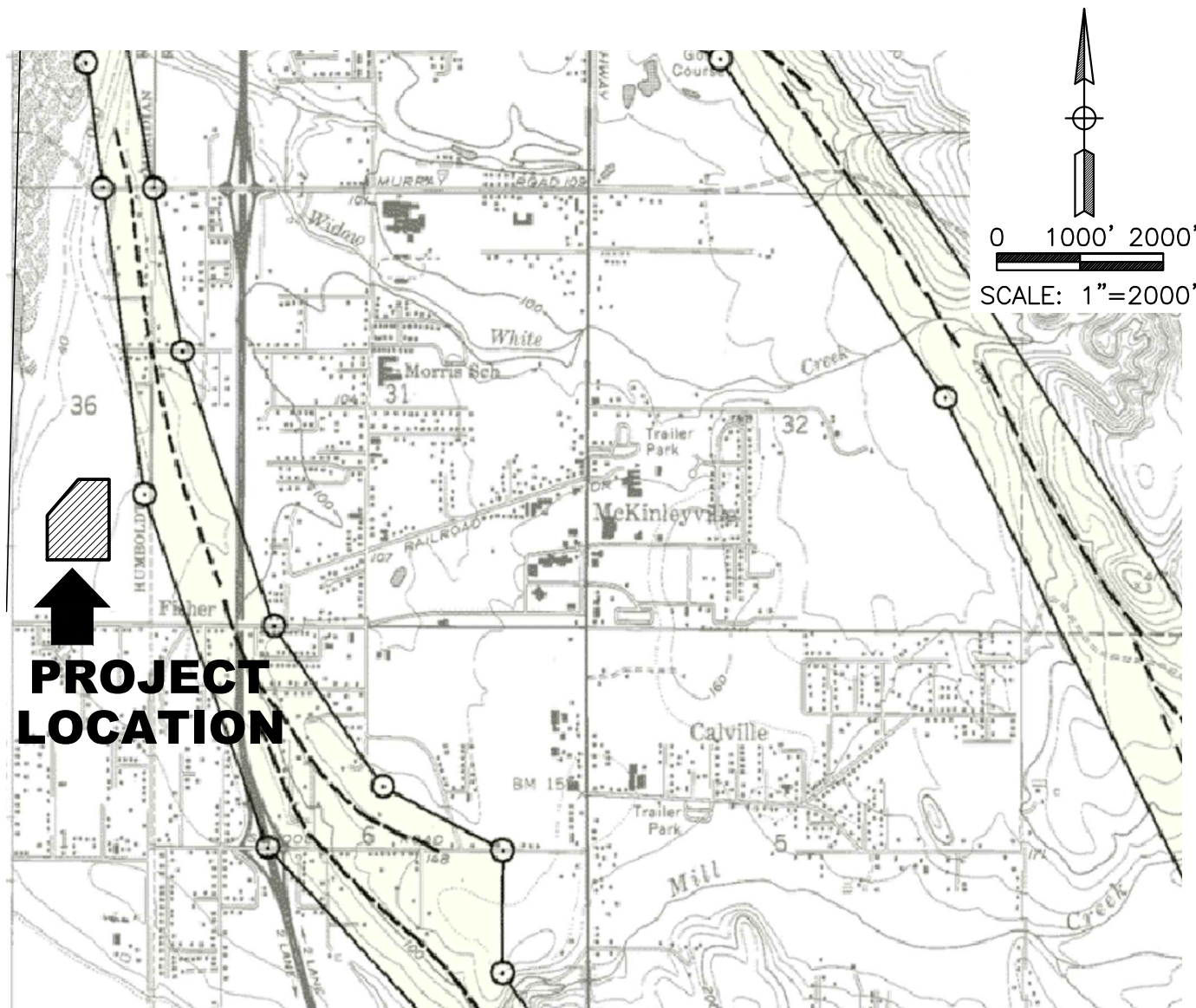
- Qbs BEACH AND DUNE SAND (Holocene):** unconsolidated fine- to coarse-grained sand with smaller amounts of shell fragments and pebbles.
- Qsc STREAM CHANNEL DEPOSITS (Holocene):** unconsolidated silt, sand, and pebbles to cobble-sized gravel in active river channel and flood-stage gravel bars.
- Q ALLUVIUM (Holocene):** unconsolidated, coarse- to fine-grained sand and silt on coastal plain, in valley bottoms, and along modern river flood plains; gravel in channel areas; may include some marine terrace deposits along Mad River flood plain.
- Qrt RIVER TERRACE DEPOSITS (Holocene-Pleistocene):** dominantly sand and gravel with minor amounts of silt and clay deposited during higher stands of major streams.
- Qods OLDER DUNE SANDS (Late Pleistocene):** unconsolidated deposits of fine- to coarse-grained sand; generally well vegetated.
- Qmts MARINE TERRACE DEPOSITS (Quaternary):** poorly to moderately consolidated deposits of marine silts, sands, and gravels forming flat benches on wave-cut surfaces adjacent to the Mad River flood plain.
- Qfa FALOR FORMATION (Early to Middle Pleistocene):** fluvial and shallow-water marine sediments; includes pebbly conglomerate, sandstone, and silt; in some places, contains abundant animal and plant remains.
- KJfs CENTRAL BELT FRANCISCAN SEDIMENTARY ROCKS (Cretaceous-Jurassic):** well consolidated sandstone, siltstone, and shale with minor amounts of conglomerate; structurally deformed and usually highly sheared; includes areas mapped as Franciscan Broken Formation by Carver and others (1984).
- fm FRANCISCAN MELANGE (Cretaceous-Jurassic):** individual blocks of graywacke, sandstone, mudstone, conglomerate, greenstone, chert, and serpentinite in a sheared argillaceous matrix.

- LITHOLOGIC CONTACT:** dashed where approximately located.
- FAULT:** dashed where approximately located, dotted where projected or inferred, queried where uncertain.



<div>LACO</div> <div>EUREKA • UKIAH • SANTA ROSA</div> <div>1-800-515-5054 www.lacoassociates.com</div>	PROJECT	MCSD WWMF IMPROVEMENTS PROJECT	BY	JB	FIGURE 3
	CLIENT	KENNEDY/JENKS CONSULTING	DATE	8/29/13	
	LOCATION	McKINLEYVILLE WWMF	CHECK	MRL	JOB NO. 7624.00
		ALQUIST-PRIOLO ZONE MAP	SCALE	AS SHOWN	

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STATE OF CALIFORNIA
SPECIAL STUDIES ZONES
Delineated in compliance with
Chapter 7.5, Division 2 of the California Public Resources Code
(Alquist-Priolo Special Studies Zones Act)

ARCATA NORTH QUADRANGLE

OFFICIAL MAP
Effective: July 1, 1983

MAP EXPLANATION

Potentially Active Faults

1906

 Faults considered to have been active during Holocene time and to have a relatively high potential for surface rupture; solid line where accurately located, long dash where approximately located, short dash where inferred, dotted where concealed; query (?) indicates additional uncertainty. Evidence of historic offset indicated by year of earthquake-associated event or C for displacement caused by creep or possible creep.

Special Studies Zone Boundaries

These are delineated as straight-line segments that connect encircled turning points so as to define special studies zone segments.

 Seaward projection of zone boundary.

REFERENCES USED TO COMPILE FAULT DATA

Arcata North Quadrangle

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For additional information on faults in this map area, the rationale used for zoning, and additional references consulted, refer to unpublished Fault Evaluation Reports on file at the San Francisco District Office of CDMG.

IMPORTANT - PLEASE NOTE

- 1) This map may not show all faults that have the potential for surface fault rupture, either within the special studies zones or outside their boundaries.
- 2) Faults shown are the basis for establishing the boundaries of the special studies zones.
- 3) The identification and location of these faults are based on the best available data. However, the quality of data used is varied. Traces have been drawn as accurately as possible at this map scale.
- 4) Fault information on this map is not sufficient to serve as a substitute for the geologic site investigations (special studies) required under Chapter 7.5 of Division 2 of the California Public Resources Code.

CDMG, 1983

Aug 29, 2013 - 10:35am
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APPENDIX 1

ASFE Brochure

Important Information about Your Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you — should apply the report for any purpose or project except the one originally contemplated.*

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,

- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time to perform additional study.* Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that

have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention.* Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.

Rely on Your ASFE-Member Geotechnical Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.



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APPENDIX 2

Boring Logs

CLIENT Kennedy/Jenks Consultants, Inc.

PROJECT NAME McKinleyville WWMF

PROJECT NUMBER 7624.00

PROJECT LOCATION McKinleyville, CA

DATE STARTED 5/2/13 COMPLETED 5/2/13

GROUND ELEVATION HOLE SIZE 8 inches

DRILLING CONTRACTOR CLEAR HEART DRILLING

GROUND WATER LEVELS:

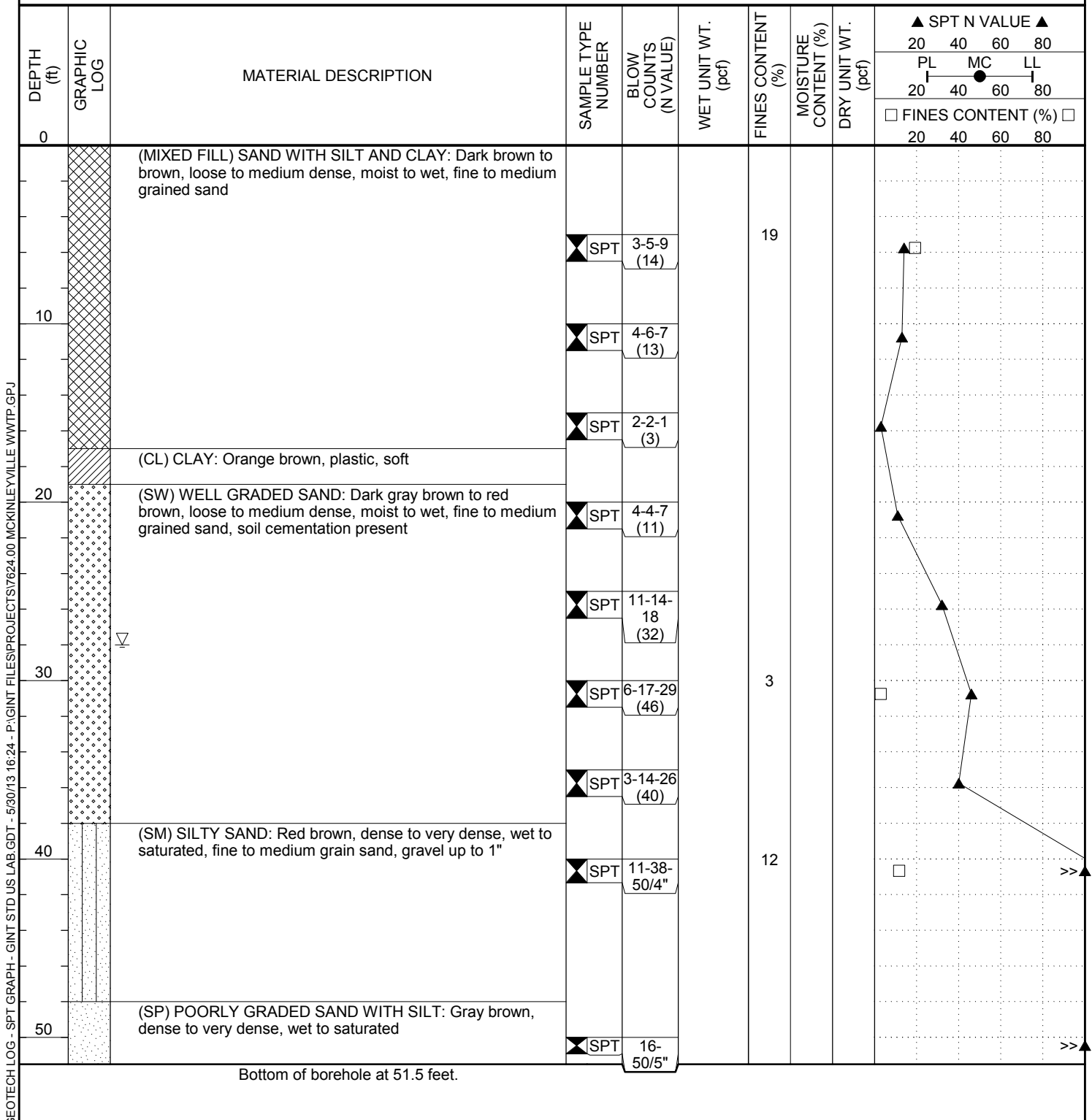
DRILLING METHOD DR7KTrack Mounted SPT

▽ AT TIME OF DRILLING 28.00 feet

LOGGED BY MRL CHECKED BY BED

AT END OF DRILLING ---

NOTES MW installed to 23 feet bgs (0.010 slot screen 10-23 feet bgs, #3 sand 9-23 feet bgs, bentonite 7-9 feet bgs, concrete to surface)



CLIENT Kennedy/Jenks Consultants, Inc.

PROJECT NAME McKinleyville WWMF

PROJECT NUMBER 7624.00

PROJECT LOCATION McKinleyville, CA

DATE STARTED 5/2/13 COMPLETED 5/2/13

GROUND ELEVATION HOLE SIZE 8 inches

DRILLING CONTRACTOR CLEAR HEART DRILLING

GROUND WATER LEVELS:

DRILLING METHOD DR7KTrack Mounted SPT

AT TIME OF DRILLING ---

LOGGED BY MRL CHECKED BY BED

AT END OF DRILLING ---

NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	WET UNIT WT. (pcf)	FINES CONTENT (%)	MOISTURE CONTENT (%)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
									20	40	60	80
									PL	MC	LL	
0									20	40	60	80
									20	40	60	80
									□ FINES CONTENT (%) □			
									20	40	60	80
		(MIXED FILL) SAND WITH SILT AND CLAY: Dark brown to red brown, loose to medium dense, moist, fine grained sand										
			MC	5-7-9 (16)								
10			MC	4-7-8 (15)	113		27.9	88				
		No core recovery	MC	3-6-7 (13)								
		(SM) SILTY SAND: Brown to dark brown, loose to medium dense, moist, low plasticity fines, soil oxidation present										
20			SPT	3-5-7 (12)								
		(SP) POORLY GRADED SAND: Gray brown, medium dense, moist to wet, fine to medium grained sand										
			SPT	9-14-17 (31)								

Bottom of borehole at 27.0 feet.

CLIENT Kennedy/Jenks Consultants, Inc.

PROJECT NAME McKinleyville WWMF

PROJECT NUMBER 7624.00

PROJECT LOCATION McKinleyville, CA

DATE STARTED 5/2/13 COMPLETED 5/2/13

GROUND ELEVATION HOLE SIZE 8 inches

DRILLING CONTRACTOR CLEAR HEART DRILLING

GROUND WATER LEVELS:

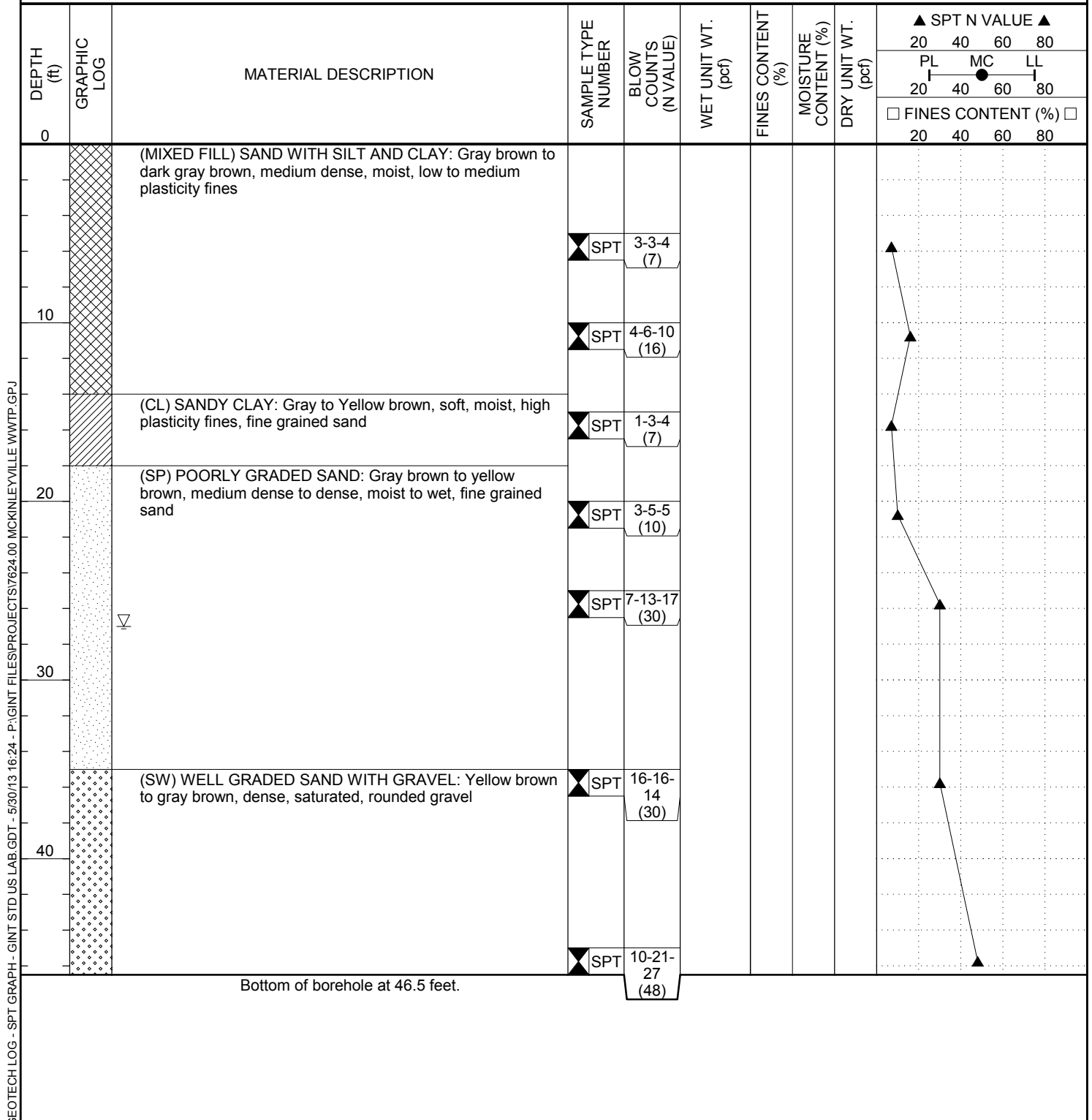
DRILLING METHOD DR7KTrack Mounted SPT

AT TIME OF DRILLING 27.00 feet

LOGGED BY JMW CHECKED BY BED

AT END OF DRILLING ---

NOTES MW installed to 25 feet bgs (0.010 slot screen 10-25 feet bgs, #3 sand 9-25 feet bgs, bentonite 7-9 feet bgs, concrete 1-7 feet bgs to Christy well box at surface)



GEOTECH LOG - SPT GRAPH - GINT STD US LAB.GDT - 5/30/13 16:24 - P:\GINT FILES\PROJECTS\7624.00 MCKINLEYVILLE WWTP.GPJ

CLIENT Kennedy/Jenks Consultants, Inc.

PROJECT NAME McKinleyville WWMF

PROJECT NUMBER 7624.00

PROJECT LOCATION McKinleyville, CA

DATE STARTED 5/2/13 COMPLETED 5/2/13

GROUND ELEVATION HOLE SIZE 8 inches

DRILLING CONTRACTOR CLEAR HEART DRILLING

GROUND WATER LEVELS:

DRILLING METHOD DR7KTrack Mounted SPT

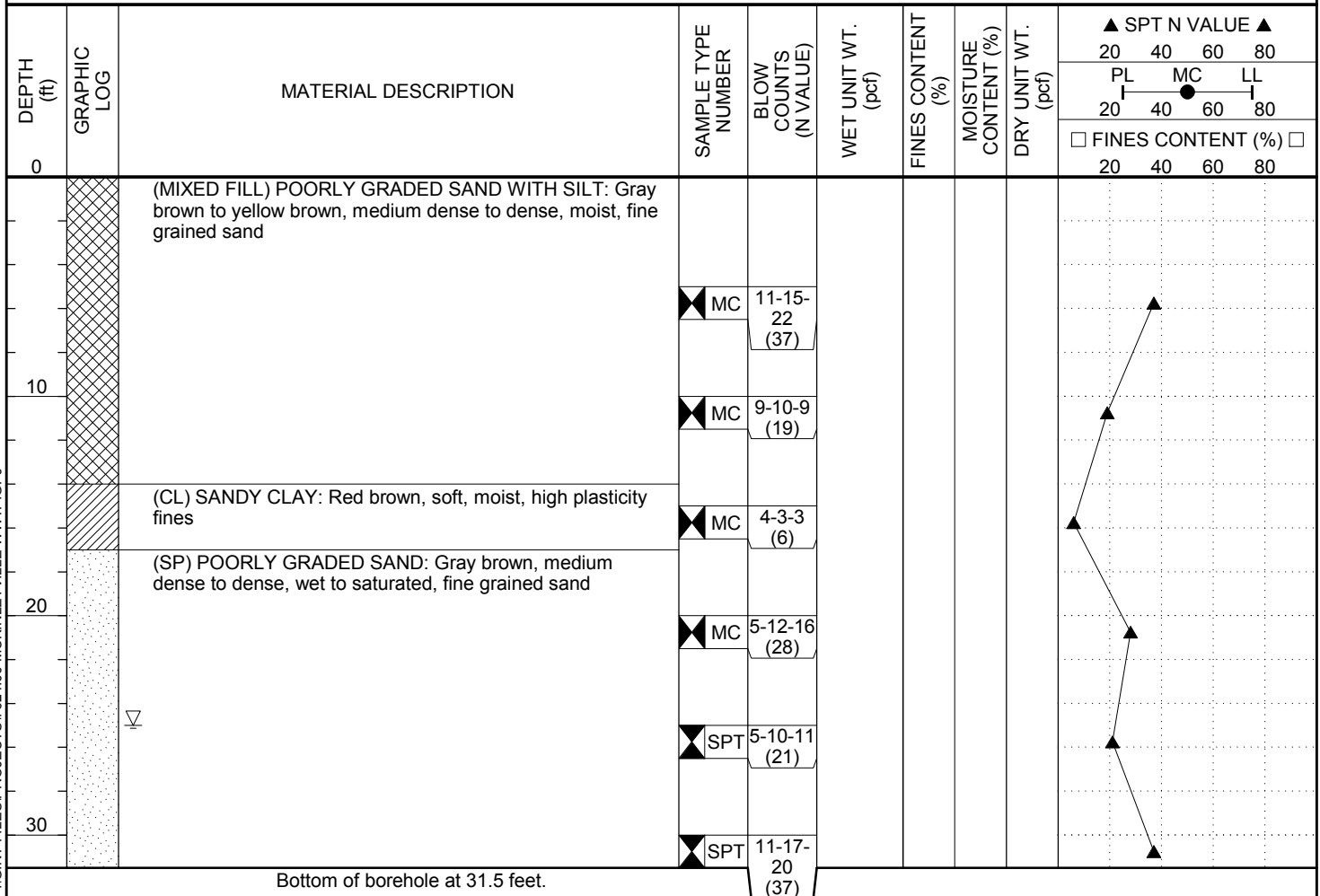
▽ AT TIME OF DRILLING 25.00 feet

LOGGED BY JMW CHECKED BY BED

AT END OF DRILLING ---

NOTES

GEOTECH LOG - SPT GRAPH - GINT STD US LAB.GDT - 5/30/13 16:24 - P:\GINT FILES\PROJECTS\7624.00 MCKINLEYVILLE WWTP.GPJ



CLIENT Kennedy/Jenks Consultants, Inc.

PROJECT NAME McKinleyville WWMF

PROJECT NUMBER 7624.00

PROJECT LOCATION McKinleyville, CA

DATE STARTED 5/2/13 COMPLETED 5/2/13

GROUND ELEVATION HOLE SIZE 8 inches

DRILLING CONTRACTOR CLEAR HEART DRILLING

GROUND WATER LEVELS:

DRILLING METHOD DR7KTrack Mounted SPT

AT TIME OF DRILLING ---

LOGGED BY JMW CHECKED BY BED

AT END OF DRILLING ---

NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	WET UNIT WT. (pcf)	FINES CONTENT (%)	MOISTURE CONTENT (%)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
									20	40	60	80
									PL	MC	LL	
0									20	40	60	80
									□ FINES CONTENT (%) □			
									20	40	60	80
		(MIXED FILL) SAND WITH SILT AND CLAY: Yellow brown, loose to medium dense, moist to wet, fine grained sand										
			MC	11-9-12 (21)								
10			MC	4-4-7 (11)								
		(SC) CLAYEY SAND: Gray to yellow brown, medium dense, moist, medium plasticity, fine grained sand	MC	2-5-9 (14)								
		(SP) POORLY GRADED SAND WITH SILT: Red brown, dense, saturated, non-plastic fines, fine grained sand										
20			SPT	5-11-20 (31)								

Bottom of borehole at 21.5 feet.
















CLIENT Kennedy/Jenks Consultants, Inc.

PROJECT NAME McKinleyville WWMF

PROJECT NUMBER 7624.00

PROJECT LOCATION McKinleyville, CA

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS					TYPICAL NAMES
COARSE GRAINED SOILS More than Half > #200 sieve	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW		WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES
			GP		POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES
		GRAVELS WITH OVER 15% FINES	GM		SILTY GRAVELS, POORLY GRADED GRAVEL-SAND-SILT MIXTURES
			GC		CLAYEY GRAVELS, POORLY GRADED GRAVEL-SAND-CLAY MIXTURES
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS WITH LITTLE OR NO FINES	SW		WELL GRADED SANDS, GRAVELLY SANDS
			SP		POORLY GRADED SANDS, GRAVELLY SANDS
		SANDS WITH OVER 15% FINES	SM		SILTY SANDS, POORLY GRADED SAND-SILT MIXTURES
			SC		CLAYEY SANDS, POORLY GRADED SAND-CLAY MIXTURES
FINE GRAINED SOILS More than Half < #200 sieve	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50		ML		INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, 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 CLAYS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50		MH		INORGANIC SILTS, MICACEOUS OR DIATOMACIOUS 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
HIGHLY ORGANIC SOILS			Pt		PEAT AND OTHER HIGHLY ORGANIC SOILS

KEY TO TEST DATA

	Modified California (MC)	RV	R-Value
	Standard Penetration Test (SPT)	SA	Sieve Analysis
	Pushed Shelby Tube (ST)	SW	Swell Test
	Auger Cuttings	TC	Cyclic Triaxial
	Grab Sample (GB)	DS	Direct Shear
	Continuous Core Sample (CC)	CP	Compaction
c	Cohesion	UC	Unconfined Compression
ϕ	Friction Angle	CN	Consolidation
MC	Moisture Content	τ	Shear Strength
DD	Dry Density		Water Level at Time of Drilling
PP	Pocket Penetrometer		Water Level after Drilling

NOTES: The lines separating soil layers are approximate boundaries.

Blow counts represent the number of blows of a 140-pound hammer falling 30 inches to drive an 18-inch sampler the final 12 inches.

Modified California Sampler blow counts have been converted to standard N-value blow counts using Burmister's energy input factor of 0.65.

APPENDIX 3

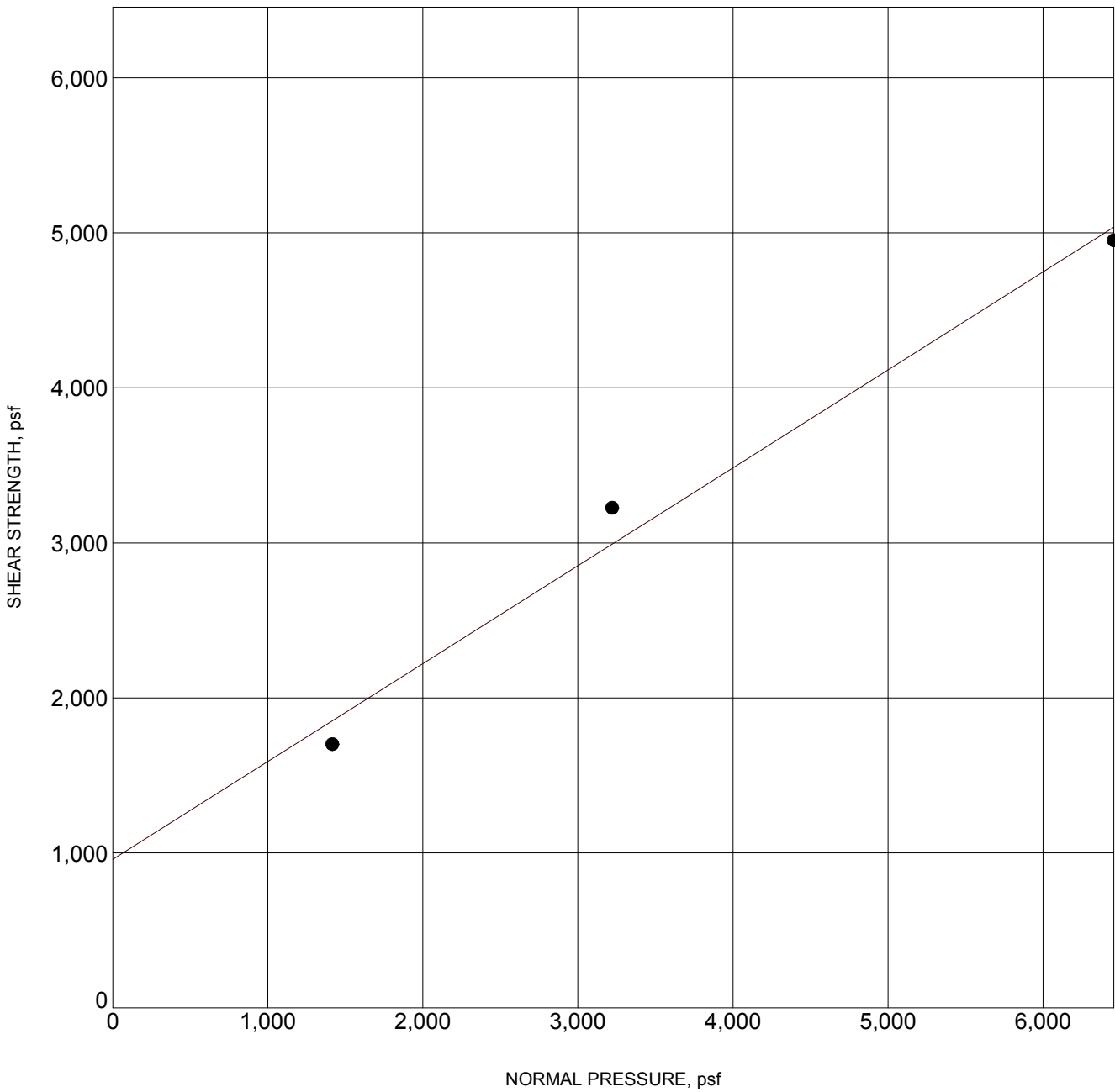
Laboratory Test Results

CLIENT Kennedy/Jenks Consultants, Inc.

PROJECT NAME McKinleyville WWMF

PROJECT NUMBER 7624.00

PROJECT LOCATION McKinleyville, CA



BOREHOLE	DEPTH	Classification	γ_d	MC%	c	ϕ
● B5	16.0	SC	114.8	19.1	957.9	32



Remarks:

[illegible]

APPENDIX 4

Liquefaction Analysis

PROJECT	McKinleyville WWTP		JOB NO.	7624.00	SHEET
CLIENT	Kennedy/Jenks Consultants, Inc.				1 of 2
LOCATION	McKinleyville	ANALYSIS BY	MRL	DATE	5/16/13
		CHECKED BY	BED	CHECK DATE	5/24/2013

Peak Ground Acceleration (g) =

0.710 g

Earthquake Magnitude, (M) =

7.10 MW

Design GWT Depth (GWT) =

25.00 ft

Average Soil Unit Weight above GWT =

113.0 pcf

Average Soil Unit Weight below GWT =

135.0 pcf

Bore Hole Diameter =

7 inches

Correction for Sample Liners =

No

Rod Length Height Stick up =

4.9 ft

Sample #	Depth(ft)	N field	Soil-USCS	Flags	F.C. (%)	Energy Ratio (%)	C _E	C _B	C _R	C _S	N ₆₀	σ _v psf	σ _{v'} psf	C _N	(N ₁) ₆₀	ΔN -Fines	(N ₁) ₆₀ -C _S	Stress Reduc. r _d	CSR	MSF _{Sand}	K _{σ-Sand}
1	5	14	Fill	Unsaturated	19.2	60	1	1.15	0.8	1	12.9	565	565	1.7	21.9	4.33	26.2	0.99	0.46	1.11	1.1
2	10	13	Fill	Unsaturated	19.2	60	1	1.15	0.85	1	12.7	1130	1130	1.33	16.9	4.33	21.2	0.98	0.45	1.11	1.09
3	15	3	Fill	Unsaturated	19.2	60	1	1.15	0.95	1	3.28	1695	1695	1.09	3.56	4.33	7.89	0.96	0.44	1.11	1.02
4	20	11	SP	Unsaturated	2.85	60	1	1.15	0.95	1	12	2260	2260	0.94	11.3	0	11.3	0.93	0.43	1.11	0.99
5	25	32	SP		2.85	60	1	1.15	0.95	1	35	2825	2825	0.84	29.4	0	29.4	0.91	0.42	1.11	0.94
6	30	46	SP		2.85	60	1	1.15	1	1	52.9	3500	3188	0.79	41.9	0	41.9	0.88	0.45	1.11	0.88
7	35	40	SP		2.85	60	1	1.15	1	1	46	4175	3551	0.75	34.5	0	34.5	0.86	0.47	1.11	0.87
8	40	80	W-SM		11.6	60	1	1.15	1	1	92	4850	3914	0.71	65.8	1.9	67.7	0.83	0.48	1.11	0.82
9	50	80	SP-SM		11.6	60	1	1.15	1	1	92	6200	4640	0.66	60.4	1.9	62.3	0.78	0.48	1.11	0.77
10																					
11																					
12																					
13																					
14																					
15																					

Sample #	CRR -M=7.5 & gwc=1 atm	CRR	Liq. F.S.	Limiting Shear Strain, γ _{lim}	F ₀ Parameter	MAX. Shear Strain, γ _{max}	ΔH I, ft	Lateral Disp.(ΔLDI), ft	Vert. Consol. Strain, ε _v	Dyn. Settlement, per layer, in	Accum.Dyn. Settlement, in	Accum. Lateral. Displ. ft
1	NL	NL	2.00	0.08	0.16	0.00	5.00	0.00	0.00	0.00	0.00	0.00
2	NL	NL	2.00	0.14	0.45	0.00	5.00	0.00	0.00	0.00	0.00	0.00
3	NL	NL	2.00	0.50	0.94	0.00	5.00	0.00	0.00	0.00	0.00	0.00
4	NL	NL	2.00	0.41	0.88	0.00	5.00	0.00	0.00	0.00	0.00	0.00
5	0.45	0.47	1.13	0.05	-0.05	0.03	5.00	0.00	0.01	0.00	0.00	0.00
6	2.00	1.95	2.00	0.01	-0.95	0.00	5.00	0.00	0.00	0.00	0.00	0.00
7	1.01	0.97	2.00	0.02	-0.40	0.00	5.00	0.00	0.00	0.00	0.00	0.00
8	2.00	1.82	2.00	0.00	-3.09	0.00	5.00	0.00	0.00	0.00	0.00	0.00
9	2.00	1.71	2.00	0.00	-2.62	0.00	10.0	0.00	0.00	0.00	0.00	0.00
10												
11												
12												
12												
14												
13												
											0.00	0.00

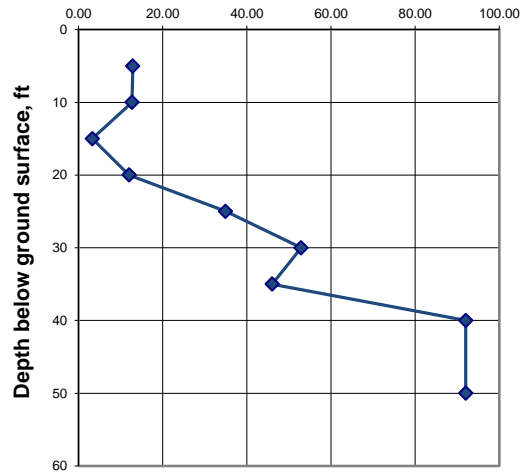
Symbols

N field	Blow count
F.C. (%)	Fines Content (<200 sieve)
C _E	Correction factor for energy ratio
C _B	Correction factor for borehole diameter
C _R	Correction factor for rod length
C _S	Correction factor for sample liners
σ _v psf	Vertical total stress
σ _{v'} psf	Vertical effective stress
C _N	Correction factor for overburden
(N ₁) ₆₀	Corrected blow count to ER=60%
r _d	Shear stress reduction coefficient
CSR	Cyclic stress ratio
MSF _{Sand}	Magnitude scaling factor for sand
K _{σ-Sand}	Overburden correction factor for sand
CRR	Cyclic resistance ratio
Liq. F.S.	Liquefaction factor of safety

PROJECT	McKinleyville WWTP	JOB NO.	7624.00	SHEET
CLIENT	Kennedy/Jenks Consultants, Inc.			2 of 2
LOCATION	McKinleyville	ANALYSIS BY	MRL	DATE
		CHECKED BY	BED	CHECK DATE
				5/24/2013

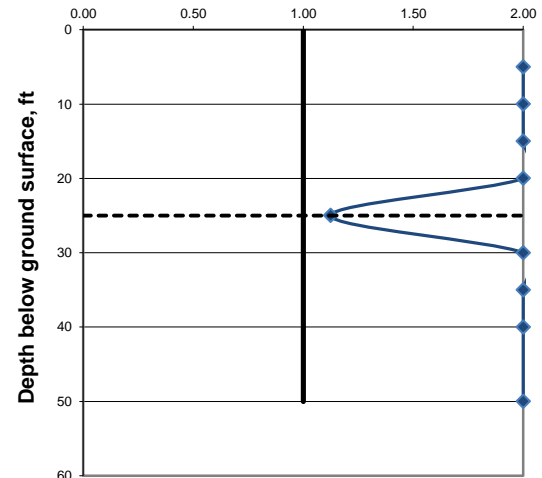
N60 vs Depth

N60-Adjusted SPT



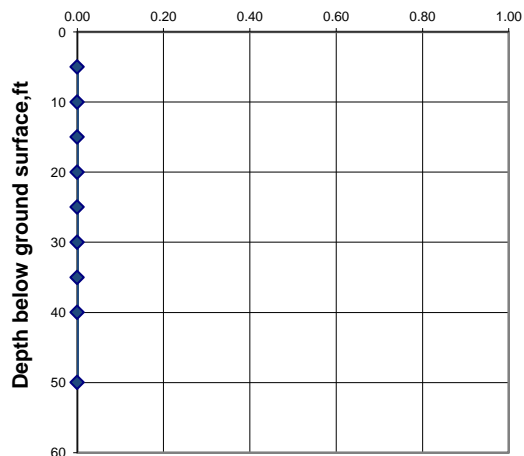
Liquefaction Factor of Safety

FS



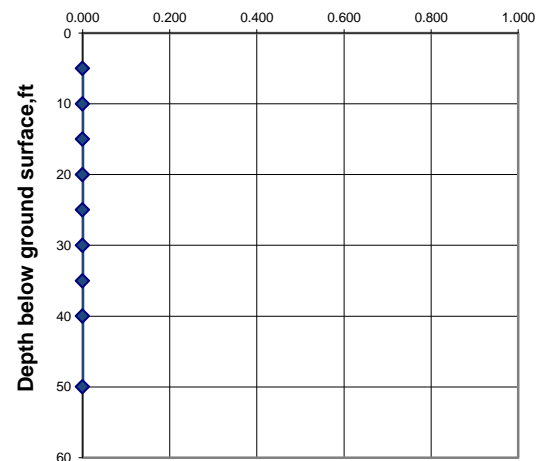
Cumulative Lateral Displacement vs Depth

Lateral Displacement, ft



Cumulative Dynamic Settlement vs Depth

Cumulative Dynamic Settlement, in



Appendix B – CalEEMod Emissions

Project emissions estimates from CalEEMod.

MCSD Wastewater Management Facility Improvements

Humboldt County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Heavy Industry	0.00	1000sqft	6.50	2,835.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	103
Climate Zone	1			Operational Year	2017
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Taken from spreadsheet provided by K/J

Construction Phase - Taken from spreadsheet prepared by K/J. End dates revised to reflect actual equipment usage.

Off-road Equipment - Taken from spreadsheet prepared by K/J. Includes trenching.

Off-road Equipment - Taken from spreadsheet prepared by K/J.

Off-road Equipment - Taken from spreadsheet prepared by K/J.

Off-road Equipment - Taken from spreadsheet prepared by K/J.

Off-road Equipment - Taken from spreadsheet prepared by K/J.

Grading -

Demolition -

Trips and VMT - Distance taken from spreadsheet provided by K/J.

Landscape Equipment - No landscaping

Construction Off-road Equipment Mitigation -

Area Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	20.00	60.00
tblConstructionPhase	NumDays	230.00	60.00
tblConstructionPhase	NumDays	20.00	15.00
tblConstructionPhase	NumDays	20.00	170.00
tblConstructionPhase	NumDays	20.00	10.00
tblConstructionPhase	PhaseEndDate	3/17/2016	3/3/2016
tblConstructionPhase	PhaseEndDate	3/3/2016	12/10/2015
tblConstructionPhase	PhaseEndDate	12/31/2015	11/20/2015
tblConstructionPhase	PhaseEndDate	12/4/2015	12/24/2015
tblConstructionPhase	PhaseStartDate	12/25/2015	12/11/2015
tblConstructionPhase	PhaseStartDate	12/11/2015	9/18/2015
tblConstructionPhase	PhaseStartDate	12/11/2015	11/2/2015

tblConstructionPhase	PhaseStartDate	11/21/2015	12/11/2015
tblGrading	MaterialImported	0.00	42,600.00
tblLandUse	LandUseSquareFeet	0.00	2,835.00
tblLandUse	LotAcreage	0.00	6.50
tblOffRoadEquipment	HorsePower	16.00	255.00
tblOffRoadEquipment	OffRoadEquipmentType		Dumpers/Tenders
tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentType		Dumpers/Tenders
tblOffRoadEquipment	OffRoadEquipmentType		Trenchers
tblOffRoadEquipment	OffRoadEquipmentType		Plate Compactors
tblOffRoadEquipment	OffRoadEquipmentType		Cement and Mortar Mixers
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
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tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	8.00	7.00
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tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	7.00

tblOffRoadEquipment	UsageHours	8.00	0.00
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tblOffRoadEquipment	UsageHours	8.00	7.50
tblOffRoadEquipment	UsageHours	8.00	7.00
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tblOffRoadEquipment	UsageHours	8.00	2.00
tblProjectCharacteristics	OperationalYear	2014	2017
tblTripsAndVMT	HaulingTripLength	20.00	7.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2015	0.5231	4.7053	3.9639	4.2700e-003	0.9808	0.2306	1.2114	0.5086	0.2139	0.7225	0.0000	386.9567	386.9567	0.0823	0.0000	388.6849
2016	0.0274	0.0178	0.0141	2.0000e-005	0.0000	1.4700e-003	1.4700e-003	0.0000	1.4700e-003	1.4700e-003	0.0000	1.9149	1.9149	2.3000e-004	0.0000	1.9197
Total	0.5505	4.7231	3.9780	4.2900e-003	0.9808	0.2321	1.2129	0.5086	0.2153	0.7239	0.0000	388.8716	388.8716	0.0825	0.0000	390.6046

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2015	0.5231	4.7053	3.9638	4.2700e-003	0.4648	0.2306	0.6954	0.2352	0.2139	0.4490	0.0000	386.9563	386.9563	0.0823	0.0000	388.6845
2016	0.0274	0.0178	0.0141	2.0000e-005	0.0000	1.4700e-003	1.4700e-003	0.0000	1.4700e-003	1.4700e-003	0.0000	1.9149	1.9149	2.3000e-004	0.0000	1.9197
Total	0.5505	4.7231	3.9780	4.2900e-003	0.4648	0.2321	0.6969	0.2352	0.2153	0.4505	0.0000	388.8712	388.8712	0.0825	0.0000	390.6042

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	52.61	0.00	42.54	53.76	0.00	37.77	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0144	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	6.0000e-005	5.1000e-004	4.3000e-004	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	4.4577	4.4577	1.9000e-004	5.0000e-005	4.4761
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0144	5.1000e-004	4.3000e-004	0.0000	0.0000	4.0000e-005	4.0000e-005	0.0000	4.0000e-005	4.0000e-005	0.0000	4.4577	4.4577	1.9000e-004	5.0000e-005	4.4761

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0144	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	6.0000e-005	5.1000e-004	4.3000e-004	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	4.4577	4.4577	1.9000e-004	5.0000e-005	4.4761
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0144	5.1000e-004	4.3000e-004	0.0000	0.0000	4.0000e-005	4.0000e-005	0.0000	4.0000e-005	4.0000e-005	0.0000	4.4577	4.4577	1.9000e-004	5.0000e-005	4.4761

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	4/17/2015	12/10/2015	5	170	Includes trenching from 9/18 to 11/12
2	Building Construction	Building Construction	9/18/2015	12/10/2015	5	60	
3	Demolition	Demolition	11/2/2015	11/20/2015	5	15	
4	Paving	Paving	12/11/2015	12/24/2015	5	10	
5	Architectural Coating	Architectural Coating	12/11/2015	3/3/2016	5	60	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 74.38

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 4,253; Non-Residential Outdoor: 1,418 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	1	7.00	162	0.38
Grading	Graders	1	7.00	174	0.41
Grading	Rubber Tired Dozers	2	7.00	255	0.40
Demolition	Rubber Tired Dozers	0	0.00	255	0.40
Grading	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Building Construction	Cranes	1	4.00	226	0.29
Building Construction	Forklifts	1	2.00	89	0.20
Building Construction	Generator Sets	0	0.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Building Construction	Welders	1	2.00	46	0.45
Demolition	Concrete/Industrial Saws	1	2.00	81	0.73
Demolition	Excavators	1	4.00	162	0.38
Demolition	Dumpers/Tenders	1	4.00	255	0.38
Paving	Pavers	0	0.00	125	0.42
Paving	Paving Equipment	1	7.50	130	0.36
Paving	Rollers	2	7.50	80	0.38
Architectural Coating	Air Compressors	1	2.00	78	0.48
Grading	Generator Sets	1	2.00	84	0.74
Grading	Dumpers/Tenders	8	6.00	16	0.38
Grading	Trenchers	1	4.00	80	0.50
Grading	Plate Compactors	1	4.00	8	0.43
Building Construction	Cement and Mortar Mixers	1	2.00	9	0.56

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	16	40.00	0.00	5,325.00	10.80	7.30	7.00	LD_Mix	HDT_Mix	HHDT
Building Construction	4	1.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	3	8.00	0.00	5.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	3	8.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Grading - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.9376	0.0000	0.9376	0.4970	0.0000	0.4970	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3941	4.0338	2.7014	3.0000e-003		0.2101	0.2101		0.1948	0.1948	0.0000	276.0261	276.0261	0.0745	0.0000	277.5894
Total	0.3941	4.0338	2.7014	3.0000e-003	0.9376	0.2101	1.1478	0.4970	0.1948	0.6918	0.0000	276.0261	276.0261	0.0745	0.0000	277.5894

3.2 Grading - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0708	0.3888	0.8581	7.4000e-004	0.0154	6.0500e-003	0.0214	4.2400e-003	5.5600e-003	9.8000e-003	0.0000	67.0743	67.0743	6.7000e-004	0.0000	67.0883
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0220	0.0314	0.2642	3.1000e-004	0.0262	2.9000e-004	0.0265	6.9900e-003	2.6000e-004	7.2500e-003	0.0000	24.1844	24.1844	1.9700e-003	0.0000	24.2257
Total	0.0928	0.4201	1.1223	1.0500e-003	0.0416	6.3400e-003	0.0479	0.0112	5.8200e-003	0.0171	0.0000	91.2587	91.2587	2.6400e-003	0.0000	91.3140

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4219	0.0000	0.4219	0.2237	0.0000	0.2237	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3941	4.0338	2.7014	3.0000e-003		0.2101	0.2101		0.1948	0.1948	0.0000	276.0258	276.0258	0.0745	0.0000	277.5891
Total	0.3941	4.0338	2.7014	3.0000e-003	0.4219	0.2101	0.6321	0.2237	0.1948	0.4185	0.0000	276.0258	276.0258	0.0745	0.0000	277.5891

3.2 Grading - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0708	0.3888	0.8581	7.4000e-004	0.0154	6.0500e-003	0.0214	4.2400e-003	5.5600e-003	9.8000e-003	0.0000	67.0743	67.0743	6.7000e-004	0.0000	67.0883
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0220	0.0314	0.2642	3.1000e-004	0.0262	2.9000e-004	0.0265	6.9900e-003	2.6000e-004	7.2500e-003	0.0000	24.1844	24.1844	1.9700e-003	0.0000	24.2257
Total	0.0928	0.4201	1.1223	1.0500e-003	0.0416	6.3400e-003	0.0479	0.0112	5.8200e-003	0.0171	0.0000	91.2587	91.2587	2.6400e-003	0.0000	91.3140

3.3 Building Construction - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0181	0.1645	0.0731	1.2000e-004		8.6300e-003	8.6300e-003		8.0400e-003	8.0400e-003	0.0000	10.9071	10.9071	3.1500e-003	0.0000	10.9733
Total	0.0181	0.1645	0.0731	1.2000e-004		8.6300e-003	8.6300e-003		8.0400e-003	8.0400e-003	0.0000	10.9071	10.9071	3.1500e-003	0.0000	10.9733

3.3 Building Construction - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9000e-004	2.8000e-004	2.3300e-003	0.0000	2.3000e-004	0.0000	2.3000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.2134	0.2134	2.0000e-005	0.0000	0.2138
Total	1.9000e-004	2.8000e-004	2.3300e-003	0.0000	2.3000e-004	0.0000	2.3000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.2134	0.2134	2.0000e-005	0.0000	0.2138

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0181	0.1645	0.0731	1.2000e-004		8.6300e-003	8.6300e-003		8.0400e-003	8.0400e-003	0.0000	10.9071	10.9071	3.1500e-003	0.0000	10.9732
Total	0.0181	0.1645	0.0731	1.2000e-004		8.6300e-003	8.6300e-003		8.0400e-003	8.0400e-003	0.0000	10.9071	10.9071	3.1500e-003	0.0000	10.9732

3.3 Building Construction - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9000e-004	2.8000e-004	2.3300e-003	0.0000	2.3000e-004	0.0000	2.3000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.2134	0.2134	2.0000e-005	0.0000	0.2138
Total	1.9000e-004	2.8000e-004	2.3300e-003	0.0000	2.3000e-004	0.0000	2.3000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.2134	0.2134	2.0000e-005	0.0000	0.2138

3.4 Demolition - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.3000e-004	0.0000	5.3000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.9000e-003	0.0276	0.0200	3.0000e-005		1.6300e-003	1.6300e-003		1.5600e-003	1.5600e-003	0.0000	2.8981	2.8981	6.7000e-004	0.0000	2.9122
Total	2.9000e-003	0.0276	0.0200	3.0000e-005	5.3000e-004	1.6300e-003	2.1600e-003	8.0000e-005	1.5600e-003	1.6400e-003	0.0000	2.8981	2.8981	6.7000e-004	0.0000	2.9122

3.4 Demolition - 2015**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	9.0000e-005	9.1000e-004	9.5000e-004	0.0000	4.0000e-005	2.0000e-005	6.0000e-005	1.0000e-005	1.0000e-005	3.0000e-005	0.0000	0.1724	0.1724	0.0000	0.0000	0.1725
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.9000e-004	5.5000e-004	4.6600e-003	1.0000e-005	4.6000e-004	1.0000e-005	4.7000e-004	1.2000e-004	0.0000	1.3000e-004	0.0000	0.4268	0.4268	3.0000e-005	0.0000	0.4275
Total	4.8000e-004	1.4600e-003	5.6100e-003	1.0000e-005	5.0000e-004	3.0000e-005	5.3000e-004	1.3000e-004	1.0000e-005	1.6000e-004	0.0000	0.5992	0.5992	3.0000e-005	0.0000	0.6000

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.4000e-004	0.0000	2.4000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.9000e-003	0.0276	0.0200	3.0000e-005		1.6300e-003	1.6300e-003		1.5600e-003	1.5600e-003	0.0000	2.8981	2.8981	6.7000e-004	0.0000	2.9122
Total	2.9000e-003	0.0276	0.0200	3.0000e-005	2.4000e-004	1.6300e-003	1.8700e-003	4.0000e-005	1.5600e-003	1.6000e-003	0.0000	2.8981	2.8981	6.7000e-004	0.0000	2.9122

3.4 Demolition - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	9.0000e-005	9.1000e-004	9.5000e-004	0.0000	4.0000e-005	2.0000e-005	6.0000e-005	1.0000e-005	1.0000e-005	3.0000e-005	0.0000	0.1724	0.1724	0.0000	0.0000	0.1725
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.9000e-004	5.5000e-004	4.6600e-003	1.0000e-005	4.6000e-004	1.0000e-005	4.7000e-004	1.2000e-004	0.0000	1.3000e-004	0.0000	0.4268	0.4268	3.0000e-005	0.0000	0.4275
Total	4.8000e-004	1.4600e-003	5.6100e-003	1.0000e-005	5.0000e-004	3.0000e-005	5.3000e-004	1.3000e-004	1.0000e-005	1.6000e-004	0.0000	0.5992	0.5992	3.0000e-005	0.0000	0.6000

3.5 Paving - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.0200e-003	0.0507	0.0312	4.0000e-005		3.2900e-003	3.2900e-003		3.0200e-003	3.0200e-003	0.0000	4.1313	4.1313	1.2300e-003	0.0000	4.1572
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	5.0200e-003	0.0507	0.0312	4.0000e-005		3.2900e-003	3.2900e-003		3.0200e-003	3.0200e-003	0.0000	4.1313	4.1313	1.2300e-003	0.0000	4.1572

3.5 Paving - 2015**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.6000e-004	3.7000e-004	3.1100e-003	0.0000	3.1000e-004	0.0000	3.1000e-004	8.0000e-005	0.0000	9.0000e-005	0.0000	0.2845	0.2845	2.0000e-005	0.0000	0.2850
Total	2.6000e-004	3.7000e-004	3.1100e-003	0.0000	3.1000e-004	0.0000	3.1000e-004	8.0000e-005	0.0000	9.0000e-005	0.0000	0.2845	0.2845	2.0000e-005	0.0000	0.2850

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.0200e-003	0.0507	0.0312	4.0000e-005		3.2900e-003	3.2900e-003		3.0200e-003	3.0200e-003	0.0000	4.1313	4.1313	1.2300e-003	0.0000	4.1572
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	5.0200e-003	0.0507	0.0312	4.0000e-005		3.2900e-003	3.2900e-003		3.0200e-003	3.0200e-003	0.0000	4.1313	4.1313	1.2300e-003	0.0000	4.1572

3.5 Paving - 2015**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.6000e-004	3.7000e-004	3.1100e-003	0.0000	3.1000e-004	0.0000	3.1000e-004	8.0000e-005	0.0000	9.0000e-005	0.0000	0.2845	0.2845	2.0000e-005	0.0000	0.2850
Total	2.6000e-004	3.7000e-004	3.1100e-003	0.0000	3.1000e-004	0.0000	3.1000e-004	8.0000e-005	0.0000	9.0000e-005	0.0000	0.2845	0.2845	2.0000e-005	0.0000	0.2850

3.6 Architectural Coating - 2015**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	8.2100e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0200e-003	6.4300e-003	4.7500e-003	1.0000e-005		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004	0.0000	0.6383	0.6383	8.0000e-005	0.0000	0.6401
Total	9.2300e-003	6.4300e-003	4.7500e-003	1.0000e-005		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004	0.0000	0.6383	0.6383	8.0000e-005	0.0000	0.6401

3.6 Architectural Coating - 2015

Unmitigated Construction Off-Site

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

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	8.2100e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0200e-003	6.4300e-003	4.7500e-003	1.0000e-005		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004	0.0000	0.6383	0.6383	8.0000e-005	0.0000	0.6401
Total	9.2300e-003	6.4300e-003	4.7500e-003	1.0000e-005		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004	0.0000	0.6383	0.6383	8.0000e-005	0.0000	0.6401

3.6 Architectural Coating - 2015

Mitigated Construction Off-Site

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

3.6 Architectural Coating - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0246					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.7600e-003	0.0178	0.0141	2.0000e-005		1.4700e-003	1.4700e-003		1.4700e-003	1.4700e-003	0.0000	1.9149	1.9149	2.3000e-004	0.0000	1.9197
Total	0.0274	0.0178	0.0141	2.0000e-005		1.4700e-003	1.4700e-003		1.4700e-003	1.4700e-003	0.0000	1.9149	1.9149	2.3000e-004	0.0000	1.9197

3.6 Architectural Coating - 2016

Unmitigated Construction Off-Site

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

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0246					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.7600e-003	0.0178	0.0141	2.0000e-005		1.4700e-003	1.4700e-003		1.4700e-003	1.4700e-003	0.0000	1.9149	1.9149	2.3000e-004	0.0000	1.9197
Total	0.0274	0.0178	0.0141	2.0000e-005		1.4700e-003	1.4700e-003		1.4700e-003	1.4700e-003	0.0000	1.9149	1.9149	2.3000e-004	0.0000	1.9197

3.6 Architectural Coating - 2016

Mitigated Construction Off-Site

[illegible]

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

[illegible]

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Heavy Industry	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Heavy Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.424780	0.106685	0.174383	0.131324	0.085777	0.009018	0.014311	0.037694	0.002248	0.001589	0.007851	0.001308	0.003034

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	3.9010	3.9010	1.8000e-004	4.0000e-005	3.9160
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	3.9010	3.9010	1.8000e-004	4.0000e-005	3.9160
NaturalGas Mitigated	6.0000e-005	5.1000e-004	4.3000e-004	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.5567	0.5567	1.0000e-005	1.0000e-005	0.5601
NaturalGas Unmitigated	6.0000e-005	5.1000e-004	4.3000e-004	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.5567	0.5567	1.0000e-005	1.0000e-005	0.5601

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Heavy Industry	10432.8	6.0000e-005	5.1000e-004	4.3000e-004	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.5567	0.5567	1.0000e-005	1.0000e-005	0.5601
Total		6.0000e-005	5.1000e-004	4.3000e-004	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.5567	0.5567	1.0000e-005	1.0000e-005	0.5601

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Heavy Industry	10432.8	6.0000e-005	5.1000e-004	4.3000e-004	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.5567	0.5567	1.0000e-005	1.0000e-005	0.5601
Total		6.0000e-005	5.1000e-004	4.3000e-004	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.5567	0.5567	1.0000e-005	1.0000e-005	0.5601

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Heavy Industry	13409.6	3.9010	1.8000e-004	4.0000e-005	3.9160
Total		3.9010	1.8000e-004	4.0000e-005	3.9160

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Heavy Industry	13409.6	3.9010	1.8000e-004	4.0000e-005	3.9160
Total		3.9010	1.8000e-004	4.0000e-005	3.9160

6.0 Area Detail

6.1 Mitigation Measures Area

No Hearths Installed

[illegible]

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.2900e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0111					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0144	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.2900e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0111					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0144	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

7.0 Water Detail

7.1 Mitigation Measures Water

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

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Heavy Industry	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Heavy Industry	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

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

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Heavy Industry	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

9.0 Operational Offroad

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

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