APPENDIX A

Stantec

Memo

To:	Zoe Merideth City of Antioch	From:	Elena Nuño & Megna Murali Stantec Consulting Services Inc.
File:	185705365	Date:	May 21, 2021

Reference: Amports Antioch Auto Processing Facility – Air Quality Methodology and Assumptions and Results Technical Memorandum

MODELING PARAMETERS AND ASSUMPTIONS

The following modeling parameters and assumptions will be used to generate criteria air pollutant and greenhouse gas (GHG) emissions for the Amports Antioch Auto Processing Facility Project (project).

MODEL SELECTION

The California Emissions Estimator Model (CalEEMod) is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and greenhouse gas (GHG) emissions associated with both construction and operations from a variety of land use projects. CalEEMod quantifies direct emissions from construction and operation activities (including vehicle use), as well as indirect emissions, such as GHG emissions from energy use, solid waste disposal, vegetation planting and/or removal, and water use. Further, CalEEMod identifies mitigation measures to reduce criteria pollutant and GHG emissions along with calculating the benefits achieved from measures chosen by the user.

CalEEMod was developed for the California Air Pollution Control Officers Association (CAPCOA) in collaboration with the California Air Districts. Default data (e.g., emission factors, trip lengths, meteorology, source inventory, etc.) have been provided by the various California Air Districts to account for local requirements and conditions.

CalEEMod version 2016.3.2 will be used to estimate construction and some operational impacts of the proposed project.

Off-model calculations will be required to address some unique operational characteristics of the project, such as the marine vessels and truck carriers. Emission factors from several sources will be used including the U.S. EPA Port Emissions Inventory Guidance (U.S. EPA, 2020), CARB Ocean Going Vessels (2019), CARB Harbor Craft Emissions Estimation (2010) and U.S. EPA AP42 Compilation of Air Emission Factors.

AIR POLLUTANTS AND GHGS TO BE ASSESSED

Criteria Pollutants Assessed

The following criteria air pollutants will be assessed in this analysis: ROG, NO_X, PM_{10}, and $PM_{2.5}$.

Note that the proposed project would emit ozone precursors ROG and NO_X. However, the proposed project would not directly emit ozone since it is formed in the atmosphere during the photochemical reaction of ozone precursors.

GHGs Assessed

This analysis is restricted to GHGs identified by AB 32, which include CO_2, CH_4, N_2O, HFCs, PFCs, SF_6, and NF_3. The proposed project would generate a variety of GHGs, including several defined by AB 32 such as CO_2, CH_4 and N_2O.

Certain GHGs defined by AB 32 would not be emitted by the project. HFCs, PFCs, SF_6, and NF_3 are typically used in industrial applications, none of which would be used by the proposed project. Therefore, it is not anticipated that the proposed project would emit those GHGs.

GHG emissions associated with the proposed project construction, and operations will be estimated using CO_2e emissions as a proxy for all GHG emissions. Construction GHG emissions would be amortized over the lifetime of the Project. To obtain the CO_2e, an individual GHG is multiplied by its GWP. The GWP designates on a pound for pound basis the potency of the GHG compared to CO_2.

THRESHOLDS

Nearly all development projects in the Bay Area have the potential to generate air pollutants that may increase the difficultly of attaining National Ambient Air Quality Standards and CAAQS. Therefore, for most projects, evaluation of air quality impacts is required to comply with CEQA. The BAAQMD has developed the CEQA Air Quality Guidelines to help public agencies evaluate air quality impacts (BAAQMD 2017c). The BAAQMD's guide includes recommended thresholds of significance, including mass emission thresholds for construction-related and operational ozone precursors. The May 2017 version of the Guidelines includes revisions made to the BAAQMD's 2010 Guidelines to address the California Supreme Court's 2015 opinion in *Cal. Bldg. Indus. Ass'n vs. Bay Area Air Quality Mgmt. Dist.*, 62 Cal.4th 369.

The regional project-level emissions for the project will be estimated and compared to the BAAQMD thresholds for determining significance under CEQA.

Table 1: BAAQMD Project-Level Air Quality CEQA Thresholds of Significance

Criteria Pollutants	Construction-Related	Operational-Related	
Criteria Air Pollutants and Precursors (regional)	Average Daily Emissions (lbs/day)	Average Daily Emissions (lbs/day)	Maximum Annual Emissions (tpy)
ROG	54	54	10
NO_x	54	54	10
PM_{10} (exhaust)	82	82	15
$PM_{2.5}$ (exhaust)	54	54	10

Reference: **Amports Antioch Auto Processing Facility – Air Quality Methodology and Assumptions and Results Technical Memorandum**

Criteria Pollutants	Construction-Related	Operational-Related
$PM_{10}/PM_{2.5}$ (fugitive dust)	Best Management Practices	None
Local CO	None	9.0 ppm (8-hour average), 20.0 ppm (1-hour average)
GHGs (projects other than stationary sources)	None	Compliance with Qualified GHG Reduction Strategy OR 1,100 $MTCO_2e$/yr OR 4.6 $MTCO_2e$/SP/yr (residents + employees)
GHGs – Stationary Sources	None	10,000 $MTCO_2e$/yr
Risk and Hazards for new sources and receptors (Individual Project)	Same as operational thresholds	Compliance with Qualified Community Risk Reduction Plan OR Increased cancer risk of >10.0 in a million Increased non-cancer risk of > 1.0 Hazard Index (Chronic or Acute) Ambient PM2.5 increase: > 0.3 μg/m^3 annual average <u>Zone of Influence</u>: 1,000-foot radius from property line of source or receptor
Risk and Hazards for new sources and receptors (Cumulative Threshold)	Same as operational thresholds	Compliance with Qualified Community Risk Reduction Plan OR Increased cancer risk of >100.0 in a million Increased non-cancer risk of > 10.0 Hazard Index (Chronic or Acute) Ambient PM2.5 increase: > 0.8 μg/m^3 annual average <u>Zone of Influence</u>: 1,000-foot radius from
Accidental Release of Acutely Hazardous Air Pollutants	None	Storage or use of acutely hazardous materials locating near receptors or new receptors locating near stored or used acutely hazardous materials considered signficant.
Odors	None	Five confirmed complaints per year averaged over three years.

Notes:
CO = carbon monoxide
GHG = greenhouse gases
lbs/day = pounds per day
$MTCO_2e$/yr = metric tons of carbon dioxide equivalent per year
$MTCO_2e$/SP/yr = metric tons of carbon dioxide equivalent per service population per year
NOx = nitrogen oxide
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
PM_{10} = particulate matter 10 microns or less in diameter
ppm = parts per million
ROG = reactive organic gas
tpy = tons per year
Source: BAAQMD 2017

ASSUMPTIONS

CONSTRUCTION MODELING ASSUMPTIONS

The construction schedule utilized in the analysis represents a “worst-case” analysis scenario since emission factors for construction equipment decrease as the analysis year increases, due to improvements in technology and more stringent regulatory requirements. Therefore, construction emissions would decrease if the construction schedule moves to later years. The duration of construction activity and associated equipment represent a reasonable approximation of the expected construction fleet as required per CEQA guidelines. Site specific construction fleet may vary due to specific project needs at the time of construction.

The proposed project would require two different construction methods for the landside and waterside construction. Table 2 provides the construction schedule and offroad equipment list for the waterside construction. Table 3 provides the onroad construction vehicles associated with the waterside construction. Table 4 provides the construction schedule and offroad equipment list for the landside construction and Table 5 provide the landside onroad vehicle equipment list for construction.

Construction emissions will be totaled for each calendar year and divided by the total number of construction days to arrive at the average daily emissions. The average daily emissions will be compared to the BAAQMD thresholds of significance.

Reference: **Amports Antioch Auto Processing Facility – Air Quality Methodology and Assumptions and Results Technical Memorandum**

Table 2: Project Construction Schedule and Equipment List – Waterside

Phase	Start Date	End Date	Construction Equipment	QTY	HP	Load Factor	Hours of Use per Day
Mobilization[1]	9/3/2021	9/3/2021	Tug Boats	2	1200	0.45	8
	3/15/2022	3/15/2022	Tug Boats	2	1200	0.45	8
Pile Driving[2]	9/6/2021	11/30/21	Derrick Barge	1	500	0.43	2
	9/6/2021	11/30/21	Vibratory Hammer	1	1050	0.6	5
	9/6/2021	11/30/21	Impact Hammer	1	300	0.6	3
Deck Construction	9/3/2021	9/7/2021	Derrick Barge (demo)	1	500	0.43	8
	11/3/2021	2/8/2022	Derrick Barge (new deck construction)	1	500	0.43	6
Fenders, Wharf Appurtenances, Utilities[3]	11/30/2021	3/15/2022	Derrick Barge (new deck construction)	1	500	0.43	4
Punch List and Final Completion	3/30/2022	4/12/2022	None				

Notes

1- Tug boats will come into place barges and then return to remove the barges when done (2 days)

2 These will not be used every day during this period. Pile driving during this period is expected to take 30 days. But some cannot be completed until after the concrete deck has been placed. Distribution of vibratory vs impact hammer use is an estimate. Pile driving equipment modeled in CalEEMod as large excavators with pile driving attachments.

3 - Fenders, here, refers to installing the pile caps, fenders and fender panels on already driven steel piles. Plastic fender piles are included above in "pile driving." This phase may overlap and extend once the Deck Construction is complete, but the work would only be a few hours per day of use for at most 10 days for this group of tasks.

Reference: **Amports Antioch Auto Processing Facility – Air Quality Methodology and Assumptions and Results Technical Memorandum**

Table 3: Project Construction Onroad Vehicles Equipment List – Waterside

Phase	Start Date	End Date	Maximum Heavy-Duty Diesel Truck Haul Trips per Day (HHDT)	Total Haul Trips	Maximum Vendor Trips Per day (MHDT, HHDT)	Total Vendor Trips
Mobilization[1]	9/1/2021	9/1/2021	<1	2	1	1
Pile Driving[2]	9/6/2021	11/2/2021	0	0	0	0
Deck Construction	11/3/2021	2/8/2022	<1	56	0	0
Fenders, Wharf Appurtenances, Utilities	11/30/2021	3/29/2022	<1	3	0	0
Punch List and Final Completion	3/30/2022	4/12/2022	<1	2	1	1

Notes:

HHDT = Heavy Duty Diesel Trucks MHDT = Medium Heavy Duty Diesel Trucks

Haul Trips are assumed to be HHDT and Vendor Trips are a mixture of MHDT and HHDT

1. Mobilization of staging area will precede waterside mobilization
2. There are not anticipated to be land haul trips due to pile driving. Piles will be on the materials barge.

Reference: **Amports Antioch Auto Processing Facility – Air Quality Methodology and Assumptions and Results Technical Memorandum**

Table 4: Project Construction Schedule and Equipment List – Landside

Phase	Start Date	End Date	Working Days	Construction Equipment	QTY	HP	Load Factor	Hours of Use per Day
Mobilization	12/16/2021	12/22/2021	5	No Offroad Equipment				
Erosion Control	12/23/2021	12/29/2021	5	No Offroad Equipment				
Demolition	12/30/2021	1/5/2022	5	Concrete/Industrial Saws	2	40	0.73	6
				Excavators	1	162	0.38	6
				Rubber Tired Dozers	1	247	0.4	6
				Tractors/Loaders/Backhoes	2	97	0.37	6
Utilities Underground Construction (Water, Electrical, Sanitary Sewer, Storm Drain)	1/6/2022	3/30/2022	60	Tractors/Loaders/Backhoes	2	97	0.37	6
				Excavators	1	162	0.38	6
				Rollers	1	80	0.38	6
				Plate Compactors	1	8	0.43	6
Construct Building Foundations (Spread Footings)	3/31/2022	6/1/2022	45	Tractors/Loaders/Backhoes	2	97	0.37	6
				Excavators	1	162	0.38	6
				Rollers	1	80	0.38	6
Erect Pre-Engineered Metal Building	6/10/2022	7/7/2022	20	Cranes	1	226	0.29	6
				Forklifts	2	89	0.2	6
				Generator Sets	2	84	0.74	6
				Tractors/Loaders/ Backhoes	2	97	0.37	6
				Welders	3	46	0.45	6
Site Paving	3/31/2022	6/22/2022	60	Asphalt Cold Planers	2	225	0.78	6
				Asphalt Paver	2	130	0.36	6
				Rollers	2	80	0.38	6
				Tractors/Loaders/ Backhoes	2	97	0.37	6
Erect Light Poles	3/31/2022	4/27/2022	20	Cranes	1	226	0.29	6
Building Interior Construction	7/8/2022	8/4/2022	20	Aerial Lifts	1	62	0.31	6
				Forklifts	1	89	0.2	6
Building Finishes	8/5/2022	9/1/2022	20	Aerial Lifts	1	62	0.31	6
				Forklifts	1	89	0.2	6
Punch List and Final Completion	9/2/2022	9/8/2022	5	No Offroad Equipment				

Reference: **Amports Antioch Auto Processing Facility – Air Quality Methodology and Assumptions and Results Technical Memorandum**

Table 5: Project Construction Onroad Vehicles Equipment List – Landside

Phase	Start Date	End Date	Working Days	Maximum Heavy-Duty Diesel Truck Haul Trips per Day(HHDT) Average	Total Haul Trips	Maximum Vendor Trips Per day (MHDT, HHDT)	Total Vendor Trips
Mobilization	12/16/2021	12/22/2021	5	1	5	2	10
Erosion Control	12/23/2021	12/29/2021	5	0	0	2	10
Demolition	12/30/2021	1/5/2022	5	2	10	2	10
Utilities Underground Construction	1/6/2022	3/30/2022	60	0.5	30	0.1	6
Construct Building Foundations	3/31/2022	6/1/2022	45	2.4	108	0	0
Erect Pre-Engineered Metal Building	6/10/2022	7/7/2022	20	0.75	15	0	0
Site Paving	3/31/2022	6/22/2022	60	6.65	399	0	0
Erect Light Poles	3/31/2022	4/27/2022	20	0.5	10	0	0
Building Interior Construction	7/8/2022	8/4/2022	20	0	0	0	0
Building Finishes	8/5/2022	9/1/2022	20	0	0	0	0
Punch List and Final Completion	9/2/2022	9/8/2022	5	1	5	2	10

Notes:

HHDT = Heavy Heavy Duty Diesel Trucks

MHDT = Medium Heavy Duty Diesel Trucks

Haul Trips are assumed to be HHDT and Vendor Trips are a mixture of MHDT and HHDT

OPERATIONAL MODELING ASSUMPTIONS

Operational emissions are those emissions that occur during operation of the proposed project. Operational emissions will be estimated for 2023, the first full year of operation. The sources are summarized below.

Motor Vehicles

Onroad

Motor vehicle emissions refer to exhaust and road dust emissions from the automobiles that would travel to and from the proposed project site. The trip generation rates for each phase of the project are shown in Table 6. Mobile onroad emissions will be estimated using CalEEMod.

Table 6: Trip Generation Rates Employees and Trucks

Land Use Type	CalEEMod Land Use Type	Unit	Weekday Average Daily Trip Rate	Saturday Average Daily Trip Rate	Sunday Average Daily Trip Rate
Auto Processing/Light Industrial	General Light Industry	25.328 ksf	2.93/ksf[2]	0	0
Auto Processing/Light Industrial	User Defined Commercial	35 employees[1]	0.2375/emplolyee[3]	0	0
Auto Processing/Light Industrial	User Defined Industrial	14.62 trucks	2/truck	0	0
Auto Processing/Light Industrial	Manufacturing	1 passenger vehicle	144.24[4]	0	0

Notes:

ksf = 1,000 square feet

1. From Project Applicant, 2021

2. From Stantec Transportation Study, 2021, 30 employees would generate 2.47 trips per day, resulting in 74.1 trips per weekday. To arrive at the trip rate based on the building size, the total employee trips were divided by the building size in ksf.

3. Up to 35 stevedores are anticipated for each vessel unloading, up to 25 times per year x 2.47 trips per employee = 2,161 trips per year

4. Up to 37,500 vehicles would be unloaded at the site based on 25 vessels with up to 1,500 vehicles per vessel. The weekday trip generation would be 37,500 divided by 260 weekdays.

Trip Lengths

The CalEEMod default round trip lengths for an urban setting will be used in this analysis for the employee trips. Commercial trip types are defined as Commercial to Commercial (C-C), Commercial to Work (C-W) and Commercial to Non-Work (C-NW). The CalEEMod defaults of 28 percent C-C, 59 percent C-W, and 13 percent C-NW were revised to 100 percent C-W. The CalEEMod default trip length of 9.5 miles for C-W trips was retained. Trip lengths are for primary trips. Trip purposes are primary, diverted, and pass-by trips. Diverted trips are assumed to take a slightly different path than a primary trip. All trips for the project were assumed to be primary trips.

The project would also include heavy duty diesel truck trips to haul vehicles to their final destination. The typical radius/distance for a vehicle coming to the Bay Area region is about 50 miles, as most vehicles imported to the area will be delivered to Bay Area/Northern California dealerships. Approximately 90 percent of the vehicles would be delivered within the 50 mile range. The remaining 10 percent would be greater than 50 miles with 200 miles as likely the farthest. The weighted trip length for the trucks was estimated at 65 miles.

Up to 1,500 vehicles would be unloaded from each vessel. The vehicles are driven off the ships through the roll on roll off wharf operations (RORO). Vehicles are then staged throughout the site prior to and after processing. Vehicles are then brough to the new facility being constructed for inspection and accessorizing. The final step for the vehicles is to be driven to the truckaway area and loaded onto trailers.

AMPORTS does not have an identified vendor for the vehicles but anticipates that only passenger car vehicles will be transported to the site. Based on the site configuration it is estimated that vehicles may be driven up to one mile on the project site from RORO to final loading onto trucks.

Vehicle Fleet Mix

The vehicle fleet mix is defined as the mix of motor vehicle classes active during the operation of the proposed project. Emission factors are assigned to the expected vehicle mix as a function of vehicle class, speed, and fuel use (gasoline- and diesel-powered vehicles). The CalEEMod default fleet mix was revised for the full-time employees and part-time stevedores to reflect passenger car vehicles. Table 7 provides the fleet mix used in the operational analysis of the landside activities.

Table 7: CalEEMod Fleet Mix for Contra Costa County – Year 2023

Vehicle Category	Default	AMPORTS Employees	Delivery Trucks	Unloading/Loading of Vehicles
LDA	0.59	0.60	0	.65
LDT1	0.04	.04	0	.05
LDT2	0.19	0.2	0	.20
MDV	0.12	0.14	0	.10
LHD1	0.015	0.01	0	0
LHD2	0.005	0.01	0	0
MHD	0.010	0	0	0
HHD	0.024	0	1	0
OBUS	0.001	0	0	0
UBUS	0.001	0	0	0
MCY	0.005	0	0	0
SBUS	0.002	0	0	0
MH	0.0008	0	0	0
Total	1	1	0	1

Area Sources

Consumer Products

Consumer products are various solvents used in non-industrial applications that emit ROGs during their product use. These typically include cleaning supplies, kitchen aerosols, cosmetics and toiletries. The default CalEEMod value was used for this project for a light industrial land use.

General Category

Emission Factor (lb ROG/sqft/day): 0.0000214

Parking

Degreaser Emission Factor (lb ROG/sqft/day): 0.0000003542

Architectural Coatings (Painting)

Paints release VOC emissions. The building would be repainted on occasion. CalEEMod assumes a 10 percent reapplication rate and a emission factor of 100 grams of ROG per liter for non-residential interior surfaces and 150 grams of ROG per liter for non-residential exterior surfaces.

Energy Use

The emissions associated with the building electricity and natural gas usage (non-hearth) are estimated based on the land use type and size. The electricity energy use is in units of kilowatt hours per size metric for each land use type. Natural gas use is in units of a thousand British Thermal Units per size metric for each land use type. Table 8 provides a summary of the energy use of the building to be constructed onsite.

Table 8: Operational Energy Use – Main Building

Land Use Subtype	Title 24 Electricity Energy Intensity KWhr/size/year)	Nontitle-24 Electricity Energy Intensity (KWhr/size/year)	Lighting Energy Intensity (KWhr/size/year)	Title-24 Natural Gas Energy Intensity (KBTU/size/year)	Nontitle-24 Natural Gas Energy Intensity (KBUT/size/year)
General Light Industry 25,328 square feet	1.48	3.7	3.08	19.71	6.67
Parking Lot	0	0	0.35	0	0

Water and Wastewater Use

Supplying and treating water for the project generates GHG emissions. Depending on the specific water supply used or treatment method used these numbers can vary over a wide range. Supplying water is bringing the water from its primary source such as the ground, river, or snowpack to the treatment plant. Distributing the water is bringing the water from the treatment plant to the end users. The electricity intensity factors are multiplied by the utility GHG emissions intensity factors for the GHGs and are classified as indirect emissions. The default electricity intensity is from the CEC's March 2019 Refining Estimates of Water-Related Energy Use in California.

Wastewater may also have direct emissions of GHGs. These depend on the type of wastewater treatment system.

The CalEEMod default indoor water use for a light industrial land use is estimated to be 5,857,563 gallons per year. Based on experience, AMPORTS estimated that the vehicle processing building would demand approximately 500 gallons per day of water for a total of 130,000 gallons of water. Wastewater was also estimated at 500 gallons per day based on the 5,000 square feet of office uses (industry standard 0.1 gallons per day of wastewater flow per gross square feet.). Table 9 provides a summary of the water and wastewater energy use for the project.

Table 9: Water and Wastewater Energy Use

Source	CalEEMod Default
Electricity Intensity Factor to Supply (kWhr/Mgal)	2,117
Electricity Intensity Factor to Treat (kWhr/Mgal)	111
Electricity Intensity Factor to Distribute (kWhr/Mgal)	1,272
Electricity Intensity Factor for Wastewater (kWhr/Mgal)	1,911

Solid Waste

GHG emissions are associated with the disposal of solid waste generated by the vehicle trips to transport solid waste from the proposed project into landfills. Project generated construction waste would need to be in coordination with diversion requirements of the City.

The CalEEMod default of 31.41 tons per year was used to estimate emissions.

Marine Vessels

The project would also include up to 25 vessel calls per year at the site. Each vessel would require two tug assists for incoming and outgoing travel. The project is not anticipated to induce growth in the car import market and increase the number of vessels coming into the State. The vessels travelling to the AMPORTS facility may also have cargo for other facilities and ports in the Bay Area.

Ocean-Going Vessels

Data from the Port of Oakland 2017 Emission Inventory (Port of Oakland, 2017) showed that while most of the Ocean-Going Vessels (OGVs) stopped at one port facility, some OGVs made multiple stops. The OGV emission calculations primarily relied upon EPA's 2020 port guidance document

(U.S. EPA, 2020). The OGV fleet tier composition, vessel transit speeds, and vessel transit distances leading to and from the Golden Gate were taken from the Port of Oakland 2017 Emission Inventory (Port of Oakland, 2017). Vehicle carrier propulsion power was taken from the 2005 Port of Benicia emission inventory. Allocation of the OGV emissions are based on 2020 San Francisco Marine Exchange berth report for vehicle carriers that demonstrated 85% of visits only make one stop in the bay, 10% make two stops, 4% make three stops, and less than 1 percent make 4 stops in the bay.

BAAQMD's New Source Review Rule provides guidance for evaluating marine vessel's potential to emit for projects with a stationary source that is seeking a permit to operate from the Air District. Section 2-2-610 provides that a facility's potential to emit includes emissions from cargo carriers (other than motor vehicles). Cargo carrier emissions are included as emissions from the source that receives or loads the cargo. All emissions from cargo carrier operation within the District's jurisdictional boundaries must be included, and in cases of ships, emissions from off-shore operation out to 11 nautical miles (12.66 statute miles) from the Golden Gate Bridge must also be included. (See BAAQMD Reg. 2-2-610 for further details. Although AMPORTS will not require any permits from BAAQMD, the recommendation for off-shore emissions is incorporated into the project. A total of 126 nautical miles were used to estimate marine vessel travel emissions to and from the port (the starting point of the emissions estimate is from Sea Buoy approximately latitude 37.74993°and longitude -122.6928° degrees).

Air emissions have been quantified for three distinct operating modes of ocean-going vessels, transit (emissions from vessel operations between ports), maneuvering (slow speed vessel operations while in port areas) and hoteling while moored to a dock. No emissions from any anchorage activities were estimated as it is speculative to estimate emissions for anchorage for this type of project. Furthermore, emissions from anchorage are likely to be small because vessel arrival is timed to avoid anchorage, berth congestion is unlikely due to this being a single berth and the ability to convey timing to vessels. Should vessels go into anchorage for this facility they would go into hoteling mode which avoids main engine emissions, and any anchorage location would be close to shipping routes for the AMPORTS facility and would not result in additional travel.

Air emissions have been quantified for two types of engines and a boiler found on OGVs. The main engine is used for propulsion and is used during both transit and maneuvering modes. Auxiliary engines are used for on-board electrical power whilst smaller boilers are present to provide steam heat for fuel heating and hot water. According to the CARB Emission Estimation Methodology, auxiliary engines are used in all three modes of operations (transit, maneuvering, and hoteling); boilers are only used during maneuvering and hoteling (CARB 2011).

The time in mode and load propulsion engine was calculated based on the vessel speed and the distance traveled in each mode.

The time in mode for transit mode of the vessel was determined by assuming transit at 19.1 knots for 8.7 nautical miles, 13.5 knots for 52.8 nautical miles, and 9 knots for 1.5 nautical miles.

The maneuvering mode was determined based on a travel speed of 5.51 knots from the berth to berthing. The maneuvering time was based on the distance traveled divided by speed for docking or undocking.

Hoteling time was determined by the time spent at berth. Hoteling time was estimated to be 8 hours per vessel call. During hoteling it is assumed the ships auxiliary engine and boiler engines are in operation.

Engine power rates were taken from U.S. EPA Port Emissions Inventory Guidance (U.S. EPA, 2020) for auxiliary power and boiler power, and Port of Benicia 2005 Inventory (Port of Benicia, 2005) for propulsion power as shown in Table 10 for auto carriers at the speed of 20.3 knots.

Table 10: Average Vessel Characteristics (U.S. EPA 2020, Port of Benicia 2005)

Mode	Propulsion Power	Auxiliary Power	Boiler Power
	(kilowatts)		
Transit	11,531	950	N/A
Maneuver	11,531	1,125	268
Hoteling	N/A	800	268

At cruise speed, the main engine load is 83.1%. At higher loads, fuel consumption and engine maintenance costs go up dramatically, so vessel operators tend to operate at this level. At slower speeds, main engine load was calculated using the propeller law, which states that propulsion load varies by the cube of the vessel speed.

At main engine loads of less than 20%, engine emissions are multiplied by an adjustment factor which accounts for higher emission rates at low loads. The adjustment factor is calculated using an exponential equation developed by the U.S. EPA. The auxiliary load factors are incorporated in the low load adjustment factors shown in Table 11.

Table 11: Low Load Adjustment Factors (U.S. EPA 2020)

Propulsion Engine Load Factor	NOx	HC	CO	PM	CO_2	SO_2 (0.1% fuelsulfur content)
≤ 2%	4.63	21.18	9.68	7.29	3.28	9.54
3%	2.92	11.68	6.46	4.33	2.44	6.38
4%	2.21	7.71	4.86	3.09	2.01	4.79
5%	1.83	5.61	3.89	2.44	1.76	3.85
6%	1.60	4.35	3.25	2.04	1.59	3.21
7%	1.45	3.52	2.79	1.79	1.47	2.76

Propulsion Engine Load Factor	NOx	HC	CO	PM	CO_2	SO_2 (0.1% fuelsulfur content)
8%	1.35	2.95	2.45	1.61	1.38	2.42
9%	1.27	2.52	2.18	1.48	1.31	2.16
10%	1.22	2.20	1.96	1.38	1.25	1.95
11%	1.17	1.96	1.79	1.30	1.21	1.78
12%	1.14	1.76	1.64	1.24	1.17	1.63
13%	1.11	1.60	1.52	1.19	1.14	1.51
14%	1.08	1.47	1.41	1.15	1.11	1.41
15%	1.06	1.36	1.32	1.11	1.08	1.32
16%	1.05	1.26	1.24	1.08	1.06	1.24
17%	1.03	1.18	1.17	1.06	1.04	1.17
18%	1.02	1.11	1.11	1.04	1.03	1.11
19%	1.01	1.05	1.05	1.02	1.01	1.05
>=20%	1.00	1.00	1.00	1.00	1.00	1.00

The air emission factors associated with auto carriers were derived from the EPA's 2020 port guidance document (U.S. EPA, 2020). For auto carriers accessing the AMPORTS berth, propulsion engine speed and 0.1% S marine distillate were assumed as shown in Table 12 for main engines adjusted maneuvering mode by the factors shown in Table 11. Auxiliary engines also assumed 0.1% S marine distillate because both the California and Emission Control Area requires that fuel sulfur level shown in Table 13. The emission factors for boilers are shown in Table 14.

Table 12: Propulsion Engine Emission Factors – Transit Mode (g/kW-hr)

Engine Speed	Fuel	CH_4	CO	N_2O	CO_2	NO_X	PM_{10}	$PM_{2.5}$	ROG	SO_X
Slow Speed Diesel	MGO/MDO (0.1% S)	0.012	1.4	0.029	593.11	15.8	0.18	0.17	0.73	0.36

Note: Emission factor is calculated based on the Port of Oakland OGV fleet as reported in the 2017 emission inventory (Port of Oakland, 2017) and U.S. EPA 2020 port guidance document (U.S. EPA, 2020).

Table 13: Auxiliary Engine Emission Factors – Transit, Maneuvering & Hoteling (g/kW-hr)

Engine Speed	Fuel	CH_4	CO	N_2O	CO_2	NO_X	PM_{10}	$PM_{2.5}$	ROG	SO_X
Medium Speed Diesel	MGO/MDO (0.1% S)	0.008	1.1	0.029	695.7	9.5	0.19	0.17	0.48	0.42

Note: Emission factor is calculated based on the Port of Oakland OGV fleet as reported in the 2017 emission inventory (Port of Oakland, 2017) and U.S. EPA 2020 port guidance document (U.S. EPA, 2020).

Table 14: Auxiliary Boiler Emission Factors – (g/kW-hr)

Fuel	CH_4	CO	N_2O	CO_2	NO_X	PM_{10}	$PM_{2.5}$	ROG	SO_X
MGO/MDO (0.1% S)	0.002	0.20	0.075	961.8	2.0	0.20	0.19	0.12	0.59

Note: Emission factor is calculated based on the U.S. EPA 2020 port guidance document (U.S. EPA, 2020).

The emission methodology was passed on the following formula:

$E_{t, om, e} = \Sigma \text{ Pop} * EF_{e, om, f} * Hrs_{om, t} * VP \text{ om, t} * \%Load_{om, t} * \text{Activity}$

Where:

Pop = population

HP_{ave} = Maximum rated average horsepower (kW)

LF = load factor, unitless

Activity = Activity or annual operation (hr/year)

EF = emission factor (units of g/kW*hr)

om = operating mode (transit, maneuvering, hoteling)

t = vessel type (auto)

f = fuel

e = engine type

Reference: **Amports Antioch Auto Processing Facility – Air Quality Methodology and Assumptions and Results Technical Memorandum**

Tug Boat and Barge Emissions

During construction two tug boats would be used for mobilizing and demobilizing construction on the wharf. In addition, a derrick barge would be used for pile driving.

During operations two tug boats would accompany each vessel into and out of port.

The tug emissions shown in Table 15 were developed using U.S. EPA 2020 emission factors (U.S. EPA 2020). Fleet information, engine loads, and maneuvering times were taken from the Port of Oakland 2017 Emission Inventory (Port of Oakland, 2017). The emission inventory provided a detailed fleet breakout and model year information for each tug. This information was used to identify EPA emission factors and average emission factors for the fleet were applied to determine the tug emissions.

Table 15: Tug Boat Emission Factor Table (g/kWh)

Engine	HP	NO_X	PM_{10}	$PM_{2.5}$	VOC	CH_4	CO	CO_2	N_2O	SO_2
Auxiliary	218.67	6.22	0.16	0.15	0.24	0.01	1.0	679.47	0.33	0.01
Propulsion	5,280.48	8.67	0.26	0.25	0.13	0.00	2.16	679.47	0.33	0.01

Notes:
g = grams
hp = horsepower
hr – hour

The harbor craft emissions estimate will be based on the following formula:

Emissions = EF_O x F x (1 +D x A/DL) x HP x LF x Hr

Where:

Emissions = amount of pollutant emitted during one period;

EFO = model year, horsepower and engine use specific zero hour emission factor;

F = fuel correction factor which accounts for emission reduction benefits from burning cleaner fuel;

D = horsepower and pollutant specific engine deterioration factor;

A = the age of the engine when the emissions are estimated;

UL = the vessel type and engine use specific engine useful life;

HP = rated horsepower of the engine;

LF = vessel type and engine specific load factor;

Hr = number of annual operating hours of the engine

For the auxiliary engine likely to be used for the tugs escorting the auto carrier vessel into port, the following assumptions were made:

- 218.67 hp was assumed as the rated horsepower of the auxiliary engine.
- The emission factors for auxiliary engines were provided in Table 13.
- The engine load of the tug boat used to escort the auto carrier vessel is assumed to be 0.43 for the auxiliary engine.

Construction Emissions

The proposed project would generate emissions from construction equipment exhaust, worker travel, and minimal fugitive dust (due to the developed nature of the project site). These construction emissions would include criteria air pollutants from the operation of heavy construction equipment. Construction of the proposed project would be completed in two distinct phases for the landside and wharfside improvements. Construction of both phases of improvements would require approximately 210 workdays.

The construction schedule used in the analysis represents a "worst-case" analysis scenario since emission factors for construction equipment decrease as the analysis year increases due to improvements in technology and more stringent regulatory requirements. Therefore, construction emissions would decrease if the construction schedule extended to later years. The duration of construction activity and associated equipment represent a reasonable approximation of the expected construction fleet as required pursuant to CEQA guidelines. Table 16 provides the construction emissions estimate for the proposed project.

Table 16: Construction Emissions Criteria Air Pollutant Emissions

Year	ROG	NO_X	PM_{10} Exhaust	$PM_{2.5}$ Exhaust
2021	0.25	1.67	0.06	0.05
2022	0.35	2.56	0.10	0.09
Total Tons	0.59	4.23	0.15	0.15
Total Pounds	1184.14	8469.45	308.14	296.72

Average Daily Construction Emissions in Pounds	5.64	40.33	1.47	1.41
BAAQMD Threshold of Significance (average pounds/day)	54	54	82	54
Significant?	**No**	**No**	**No**	**No**

As shown in Table 16, the construction emissions would be below the BAAQMD thresholds of significance.

Operational Emissions

Operational emissions would occur over the lifetime of the proposed project and would be from mobile sources, with the ocean-going vessels (auto carrier vessels) and the harbor craft (tug assists) accounting for 90 percent of all operational emissions. The first full year of operational emissions in 2023 were used to assess potential impacts from project operations. The pollutants of concern include ROG, NOx, PM_{10}, and $PM_{2.5}$. The BAAQMD Criteria Air Pollutant Significance thresholds were used to determine impacts. The unmitigated emission estimates are presented in Table 17.

Table 17: Operational Emissions Criteria Air Pollutant Emissions

Source	ROG	NO_X	PM_{10}	$PM_{2.5}$
Area	0.22	0.00	0.00	0.00
Energy	0.00	0.03	0.00	0.00
Mobile	0.40	9.90	1.64	0.47
Auto Carrier Vessels	1.07	19.36	0.28	0.26
Tug Vessels	0.03	1.69	0.05	0.05
Total Tons	1.72	30.98	1.97	0.78
BAAQMD Threshold of Significance (tons per year)	10	10	15	10
Significant?	**No**	**Yes**	**No**	**No**
Total Pounds	3,440	61,960	3,940	1,560
Average Daily Emissions	9.42	169.75	10.79	4.27
BAAQMD Threshold of Significance (average pounds per day)	54	54	82	54
Significant?	**No**	**Yes**	**No**	**No**

As shown in Table 17, the project would exceed the BAAQMD thresholds of significance for NO_x. Impacts would be potentially significant and would need to be further analyzed.

Construction GHG Emissions

Construction emissions would be generated from the exhaust of equipment, the exhaust of construction hauling trips, and worker commuter trips. The construction phases include, site preparation, site grading, paving, building construction, and architectural coating. $MTCO_2e$ emissions during construction of the project are shown in Table 18.

Table 18: Construction Emissions GHG Emissions

Year	Pollutant	Wharfside Construction	Landside Construction	Total $MTCO_2e$
2021	$MTCO_2e$	98.52	5.5556	104.08
2022	$MTCO_2e$	77.15	246.5053	323.66
Total $MTCO_2e$				**427.73**
Amortized Emissions based on 20-year lease				21.39

The proposed project's estimated maximum yearly construction emissions would be 104 and 324 $MTCO_2e$. Commercial projects are typically amortized over a 30- to 40-year lifespan; however, based on the 20-year lease for the project the emissions were amortized over 20 years. The amortized construction emissions are expected to be 21.39 $MTCO_2e$ per year.

Operation GHG Emissions

Long-term operational GHG emissions would result from project generated vehicular/truck traffic, onsite combustion of natural gas, offsite generation of electrical power over the life of the proposed project, the energy required to convey water to and wastewater from the project site, and the emissions associated with the hauling and disposal of solid waste from the project site. Operation GHG emissions are shown in Table 19.

Table 19: Operational Emissions GHG Emissions (2023)

Source	$MTCO_2e$
Area	0.00
Energy	186.02
Mobile	5,913.33

Auto Carrier Vessels	848.77
Tug Vessels	138.80
Subtotal MTCO2e	*7,086.92*
Amortized Construction Emissions	*21.39*
Total MTCO$_2$e per year Project Threshold of Significance	**7,108.31** 10,000
Exceed Threshold of Significance?	**No**

As shown in Table 19, the total project emissions are estimated to be 7,108.31 MTCO$_2$e per year in 2023, which is below the project thresholds of significance.

ATTACHMENT A: EMISSIONS ESTIMATES

AMPORTS Antioch Facility

1. Vessel Emissions Summary
2. CalEEMod Results
3. Energy Emissions Summary

Vessel Types	Operating Mode	Emissions (g/visit) NOx	HC	ROG	CO	PM10	PM25	SO2	CO2	CH4	N2O	CO2e	BSFC (g/visit)
OGV	Transit	639,004	24,898	30,127	59,173	8,058	7,413	16,386	26,663,988	490	1,261	27,051,887	8,293,355
	Maneuvering	58,439	7,088	8,576	9,186	1,196	1,100	2,975	3,097,277	26	124	3,134,743	763,755
	Hoteling	65,921	2,809	3,399	7,562	1,660	1,527	4,022	6,596,024	56	351	6,701,946	2,057,400
Tugs	Maneuvering	61,461	926	1,121	15,030	1,802	1,748	45	4,845,338	19	2,370	5,551,914	1,518,915

Control for Visits

Annual Visits	25		
Visit Counts	**Scaled Visits**	**Visit Allocations**	**Discrete Visits**
Visits w/ 1 stop	21.37	85.5%	21.37
Visits w/ 2 stops	2.62	10.5%	2.62
Visits w/ 3 stops	0.91	3.6%	0.91
Visits w/4 stops	0.10	0.4%	0.10
			25.00

Vessel Types	Operating Mode	Emissions (annual avg lb/day) NO_x	HC	ROG[a]	CO	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CH_4	N_2O	CO_2e[b]	BSFC (lb/day)
OGV[c]	Transit[d]	88.81	3.46	4.19	8.22	1.12	1.03	2.28	3705.66	0.07	0.18	3759.57	1152.58
	Maneuvering[e]	8.12	0.99	1.19	1.28	0.17	0.15	0.41	430.45	0.004	0.02	435.65	106.14
	Hoteling[f]	9.16	0.39	0.47	1.05	0.23	0.21	0.56	916.69	0.008	0.05	931.41	285.93
Tugs[g]	Maneuvering	9.28	0.14	0.17	2.27	0.27	0.26	0.007	731.65	0.003	0.36	838.35	229.36
TOTAL		**115.4**	**5.0**	**6.0**	**12.8**	**1.8**	**1.7**	**3.3**	**5784.5**	**0.082**	**0.60**	**5964.98**	**1774.0**
BAAQMD Threshold		*54*	--	*54*	--	*82*	*54*	--	--	--	--	--	--

Notes:

a - ROG is calculated as hydrocarbons multiplied by 1.21
CARB Source: https://ww3.arb.ca.gov/msei/ordiesel/rog_tog_hcratio.xlsx

b - CO2e was calculated using the 100-year global warming potentials from the IPCC Forth Assessment Report (AR4) to remain consistent with the CalEEMod modeling and CARB's 2014 Scoping Plan Update.
CalEEMod background: http://www.aqmd.gov/docs/default-source/caleemod/02_appendix-a2016-3-2.pdf?sfvrsn=6
IPCC source: https://www.ipcc.ch/assessment-report/ar4/

c - The OGV emission calculations primarily relied upon EPA's 2020 port guidance document. The OGV fleet tier compistion, vessel transit speeds, and vessel transit distances leading to and from the Golden Gate were taken from the Port of Oakland 2017 Emission Inventory. Vehicle carrier propulsion power was taken from the 2005 Port of Benicia emission inventory. Allocation of the OGV emissions are based on 2020 San Francisco Marine Exchange berth report for vehicle carriers that demonstrated 85% of visits only make one stop in the bay, 10% make two stops, 4% make three stops, and less than a percent make 4 stops in the bay.
EPA 2020 Guidance: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P10102U0.pdf
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf
Port of Benicia 2005 Emission Inventory: https://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/Emission%20Inventory/Port%20of%20Benicia%202005%20Emissions%20Inventory%20June%202010.ashx
San Francisco Marine Exchange (SFMX) Custom Berth Report: Acquired from James Hill of the SFMX by AMPORTS on May 13, 2021.

d - Transiting calculations assume per arrival/departure distances of 8.7 nautical miles (nm) of travel outside of pilot control at cruise speed, 1.5 nm during pilot boarding proceedures at 9 knots, 52.8 nm at 13.5 knots from the Golden Gate to Antioch.
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf

e - Maneuvering activity conservatively assumed the metrics used in the Port of Oakland 2017 emission inventory: 1.33 hours inbound and 0.75 hours outbound at a 2% engine load.
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf

f - The hoteling activity is modeled as 8.1 hours of operation which is a composite that assumes 6.5 hours for general vessel visit loading operations and an additional 8 hours in the vessel over nights (i.e., 14.5 hours for a visit with an overnight). Overnighting is assumed to occur 20% of the time.

g - The tug emissions were developed using EPA 2020 emission factors. Fleet information, engine loads, and maneuvering times were taken from the Port of Oakland 2017 Emission Inventory. The emission inventory provided a detailed fleet breakout and model year information for each tug. This information was used to identify EPA emission factors and average emission factors for the fleet were applied to determine the tug emissions.
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf

Vessel Types	Operating Mode	Emissions (tons/year) NO_x	HC	ROG[a]	CO	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CH_4	N_2O	CO_2e[b] (metric tons)	BSFC (tons/year)
OGV[c]	Transit[d]	16.207	0.631	0.764	1.501	0.204	0.188	0.416	676.283	0.012	0.032	622.439	210.346
	Maneuvering[e]	1.482	0.180	0.218	0.233	0.030	0.028	0.075	78.557	0.0006	0.003	72.128	19.371
	Hoteling[f]	1.672	0.071	0.086	0.192	0.042	0.039	0.102	167.296	0.001	0.009	154.206	52.182
Tugs[g]	Maneuvering	1.694	0.026	0.031	0.414	0.050	0.048	0.001	133.527	0.0005	0.065	138.798	41.858
TOTAL		**21.1**	**0.9**	**1.1**	**2.3**	**0.3**	**0.3**	**0.6**	**1055.7**	**0.015**	**0.11**	**987.57**	**323.8**
BAAQMD Threshold		*10*	--	*10*	--	*15*	*10*	--	--	--	--	--	--

Notes:

a - ROG is calculated as hydrocarbons multiplied by 1.21
CARB Source: https://ww3.arb.ca.gov/msei/ordiesel/rog_tog_hcratio.xlsx

b - CO2e was calculated using the 100-year global warming potentials from the IPCC Forth Assessment Report (AR4) to remain consistent with the CalEEMod modeling and CARB's 2014 Scoping Plan Update.
CalEEMod background: http://www.aqmd.gov/docs/default-source/caleemod/02_appendix-a2016-3-2.pdf?sfvrsn=6
IPCC source: https://www.ipcc.ch/assessment-report/ar4/

c - The OGV emission calculations primarily relied upon EPA's 2020 port guidance document. The OGV fleet tier compistion, vessel transit speeds, and vessel transit distances leading to and from the Golden Gate were taken from the Port of Oakland 2017 Emission Inventory. Vehicle carrier propulsion power was taken from the 2005 Port of Benicia emission inventory. Allocation of the OGV emissions are based on 2020 San Francisco Marine Exchange berth report for vehicle carriers that demonstrated 85% of visits only make one stop in the bay, 10% make two stops, 4% make three stops, and less than a percent make 4 stops in the bay.
EPA 2020 Guidance: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P10102U0.pdf
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf
Port of Benicia 2005 Emission Inventory: https://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/Emission%20Inventory/Port%20of%20Benicia%202005%20Emissions%20Inventory%20June%202010.ashx
San Francisco Marine Exchange (SFMX) Custom Berth Report: Acquired from James Hill of the SFMX by AMPORTS on May 13, 2021.

d - Transiting calculations assume per arrival/departure distances of 8.7 nautical miles (nm) of travel outside of pilot control at cruise speed, 1.5 nm during pilot boarding proceedures at 9 knots, 52.8 nm at 13.5 knots from the Golden Gate to Antioch.
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf

e - Maneuvering activity conservatively assumed the metrics used in the Port of Oakland 2017 emission inventory: 1.33 hours inbound and 0.75 hours outbound at a 2% engine load.
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf

f - The hoteling activity is modeled as 8.1 hours of operation which is a composite that assumes 6.5 hours for general vessel visit loading operations and an additional 8 hours in the vessel over nights (i.e., 14.5 hours for a visit with an overnight). Overnighting is assumed to occur 20% of the time.

g - The tug emissions were developed using EPA 2020 emission factors. Fleet information, engine loads, and maneuvering times were taken from the Port of Oakland 2017 Emission Inventory. The emission inventory provided a detailed fleet breakout and model year information for each tug. This information was used to identify EPA emission factors and average emission factors for the fleet were applied to determine the tug emissions.
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf

Leg	Mode	Speed (kt)	Distance (nm)	Duration (hr)	Engine	Power (kw)	Load	Occurances Per Visit	Low Load Adjustment NOx	HC	CO	PM10	PM25	CO2	CH4	N2O	BSFC	SO2
Open Ocean	Transit	19.082	8.7	0.455927052	Propulsion	11531	0.831	2	1	1	1	1	1	1	1	1	1	1
Pilot Boarding	Transit	9	1.5	0.166666667	Propulsion	11531	0.087	2	1.35	2.95	2.45	1.61	1.61	1.38	1	1	1	2.42
SF Bay Transit	Transit	13.5	52.8	3.911111111	Propulsion	11531	0.294	2	1	1	1	1	1	1	1	1	1	1
SF Bay Maneuver In	Maneuver	5.510267762		1.33	Propulsion	11531	0.020	1	4.63	21.18	9.68	7.29	7.29	3.28	1	1	1	9.54
SF Bay Maneuver Out	Maneuver	5.510267762		0.75	Propulsion	11531	0.020	1	4.63	21.18	9.68	7.29	7.29	3.28	1	1	1	9.54
Open Ocean	Transit	19.082	8.7	0.455927052	Auxiliary	950	1	2	1	1	1	1	1	1	1	1	1	1
Pilot Boarding	Transit	9	1.5	0.166666667	Auxiliary	950	1	2	1	1	1	1	1	1	1	1	1	1
SF Bay Transit	Transit	15	52.8	3.52	Auxiliary	950	1	2	1	1	1	1	1	1	1	1	1	1
SF Bay Maneuver In	Maneuver	5.510267762		1.33	Auxiliary	1125	1	1	1	1	1	1	1	1	1	1	1	1
SF Bay Maneuver Out	Maneuver	5.510267762		0.75	Auxiliary	1125	1	1	1	1	1	1	1	1	1	1	1	1
SF Bay Maneuver In	Maneuver	5.510267762		1.33	Boiler	268	1	1	1	1	1	1	1	1	1	1	1	1
SF Bay Maneuver Out	Maneuver	5.510267762		0.75	Boiler	268	1	1	1	1	1	1	1	1	1	1	1	1
Berth	Hoteling	0	0	8.1	Auxiliary	800	1	1	1	1	1	1	1	1	1	1	1	1
Berth	Hoteling	0	0	8.1	Boiler	268	1	1	1	1	1	1	1	1	1	1	1	1

Leg	Emissions Per Visit (g) NOx	HC	CO	PM10	PM25	CO2	CH4	N2O	BSFC	SO2	CO2e
Open Ocean	137967.9	5239.95	12226.55	1603.413	1475.14	5179778	104.799	253.2642	1615651	3158.695	5257871
Pilot Boarding	7143.664	592.8685	1148.892	99.01033	91.0895	274157.1	4.019448	9.713665	61966.48	293.1786	277152.2
SF Bay Transit	419094.9	15917.01	37139.7	4870.57	4480.924	15734232	318.3403	769.3223	4907746	9594.937	15971449
SF Bay Maneuver In	22435.29	3897.856	4156.732	410.5307	377.6882	596702.3	3.680695	8.895013	56744.05	1058.349	599445
SF Bay Maneuver Out	12651.48	2198.039	2344.022	231.5023	212.9821	336486.2	2.07558	5.015985	31998.53	596.8132	338032.9
Open Ocean	8232.082	346.5046	952.8875	163.4046	150.3322	602659.8	6.930091	25.12158	187978.7	367.5097	610319.3
Pilot Boarding	3009.283	126.6667	348.3333	59.73344	54.95477	220305.6	2.533333	9.183333	68716.67	134.3452	223105.6
SF Bay Transit	63556.06	2675.2	7356.8	1261.57	1160.645	4652855	53.504	193.952	1451296	2837.371	4711990
SF Bay Maneuver In	14218.86	598.5	1645.875	282.2405	259.6613	1040944	11.97	43.39125	324686.3	634.7811	1054174
SF Bay Maneuver Out	8018.156	337.5	928.125	159.1582	146.4255	586998.6	6.75	24.46875	183093.8	357.9593	594459
SF Bay Maneuver In	712.88	35.644	71.288	71.88931	66.13817	342824	0.71288	26.733	106932	209.0585	350808.2
SF Bay Maneuver Out	402	20.1	40.2	40.53909	37.29596	193321.8	0.402	15.075	60300	117.8901	197824.2
Berth	61579.44	2592	7128	1222.335	1124.548	4508149	51.84	187.92	1406160	2749.127	4565445
Berth	4341.6	217.08	434.16	437.8221	402.7964	2087875	4.3416	162.81	651240	1273.213	2136501

Mode Totals

	NOx	HC	CO	PM10	PM25	CO2	CH4	N2O	BSFC	SO2	CO2e
Transit	639003.9	24898.2	59173.16	8057.702	7413.086	26663988	490.1261	1260.557	8293355	16386.04	27051887
Maneuvering	58438.67	7087.639	9186.241	1195.86	1100.191	3097277	25.59116	123.579	763754.6	2974.851	3134743
Hoteling	65921.04	2809.08	7562.16	1660.157	1527.344	6596024	56.1816	350.73	2057400	4022.34	6701946

Annual Visits **25**

Visit Counts	Scaled Visits	Visit Allocations	Discrete Visits
Visits w/ 1 stop	21.4	85.5%	21
Visits w/ 2 stops	2.6	10.5%	3
Visits w/ 3 stops	0.9	3.6%	1
Visits w/4 stops	0.1	0.4%	0

Parameter	Units	Emissions NOx	HC	CO	PM10	PM25	CO2	CH4	N2O	CO2e	
Visit	(g/visit)	763363.63	34794.92	75921.56	10913.72	10040.62	36357289.13	571.90	1734.87	11114509.29	
Annual Allo.	(g/yr)	17564289.22	800598.88	1746884.70	251114.55	231025.38	836547504.50	13158.86	39917.66	255734550.86	
Avg. Day	(lb/day)	106.09	4.84	10.55	1.52	1.40	5052.80	0.08	0.24		
Annual	(tpy)	19.36	0.88	1.93	0.28	0.25	922.14	0.01	0.04	255.73	<- metric tons

Vessel Types	Operating Mode	NOx	HC	ROG	CO	PM10	PM25	SO2	CO2	CH4	N2O	CO2e	BSFC
		Emissions (g/visit)											
													(g/visit)
OGV	Transit	639,004	24,898	30,127	59,173	8,058	7,413	16,386	26,663,988	490	1,261	27,051,887	8,293,355
	Maneuvering	58,439	7,088	8,576	9,186	1,196	1,100	2,975	3,097,277	26	124	3,134,743	763,755
	Hoteling	65,921	2,809	3,399	7,562	1,660	1,527	4,022	6,596,024	56	351	6,701,946	2,057,400
Tugs	Maneuvering	61,461	926	1,121	15,030	1,802	1,748	45	4,845,338	19	2,370	5,551,914	1,518,915

Control for Visits

Annual Visits	1		
Visit Counts	**Scaled Visits**	**Visit Allocations**	**Discrete Visits**
Visits w/ 1 stop	0.85	85.5%	0.85
Visits w/ 2 stops	0.10	10.5%	0.10
Visits w/ 3 stops	0.04	3.6%	0.04
Visits w/4 stops	0.00	0.4%	0.00
			1.00

Vessel Types	Operating Mode	NO_x	HC	ROG[a]	CO	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CH_4	N_2O	CO_2e[b]	BSFC (lb/day)
		Emissions (annual avg lb/day)											
OGV[c]	Transit[d]	3.55	0.14	0.17	0.33	0.04	0.04	0.09	148.23	0.00	0.01	150.38	46.10
	Maneuvering[e]	0.32	0.04	0.05	0.05	0.01	0.01	0.02	17.22	0.000	0.00	17.43	4.25
	Hoteling[f]	0.37	0.02	0.02	0.04	0.01	0.01	0.02	36.67	0.000	0.00	37.26	11.44
Tugs[g]	Maneuvering	0.37	0.01	0.01	0.09	0.01	0.01	0.000	29.27	0.000	0.01	33.53	9.17
TOTAL		**4.6**	**0.2**	**0.2**	**0.5**	**0.1**	**0.1**	**0.1**	**231.4**	**0.003**	**0.02**	**238.60**	**71.0**
BAAQMD Threshold		*54*	--	*54*	--	*82*	*54*	--	--	--	--	--	--

Notes:

a - ROG is calculated as hydrocarbons multiplied by 1.21
CARB Source: https://ww3.arb.ca.gov/msei/ordiesel/rog_tog_hcratio.xlsx

b - CO2e was calculated using the 100-year global warming potentials from the IPCC Forth Assessment Report (AR4) to remain consistent with the CalEEMod modeling and CARB's 2014 Scoping Plan Update.
CalEEMod background: http://www.aqmd.gov/docs/default-source/caleemod/02_appendix-a2016-3-2.pdf?sfvrsn=6
IPCC source: https://www.ipcc.ch/assessment-report/ar4/

c - The OGV emission calculations primarily relied upon EPA's 2020 port guidance document. The OGV fleet tier compistion, vessel transit speeds, and vessel transit distances leading to and from the Golden Gate were taken from the Port of Oakland 2017 Emission Inventory. Vehicle carrier propulsion power was taken from the 2005 Port of Benicia emission inventory. Allocation of the OGV emissions are based on 2020 San Francisco Marine Exchange berth report for vehicle carriers that demonstrated 85% of visits only make one stop in the bay, 10% make two stops, 4% make three stops, and less than a percent make 4 stops in the bay.
EPA 2020 Guidance: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P10102U0.pdf
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf
Port of Benicia 2005 Emission Inventory: https://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/Emission%20Inventory/Port%20of%20Benicia%202005%20Emissions%20Inventory%20June%202010.ashx
San Francisco Marine Exchange (SFMX) Custom Berth Report: Acquired from James Hill of the SFMX by AMPORTS on May 13, 2021.

d - Transiting calculations assume per arrival/departure distances of 8.7 nautical miles (nm) of travel outside of pilot control at cruise speed, 1.5 nm during pilot boarding proceedures at 9 knots, 52.8 nm at 13.5 knots from the Golden Gate to Antioch.
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf

e - Maneuvering activity conservatively assumed the metrics used in the Port of Oakland 2017 emission inventory: 1.33 hours inbound and 0.75 hours outbound at a 2% engine load.
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf

f - The hoteling activity is modeled as 8.1 hours of operation which is a composite that assumes 6.5 hours for general vessel visit loading operations and an additional 8 hours in the vessel over nights (i.e., 14.5 hours for a visit with an overnight). Overnighting is assumed to occur 20% of the time.

g - The tug emissions were developed using EPA 2020 emission factors. Fleet information, engine loads, and maneuvering times were taken from the Port of Oakland 2017 Emission Inventory. The emission inventory provided a detailed fleet breakout and model year information for each tug. This information was used to identify EPA emission factors and average emission factors for the fleet were applied to determine the tug emissions.
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf

Vessel Types	Operating Mode	NO_x	HC	ROG[a]	CO	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CH_4	N_2O	CO_2e[b] (metric tons)	BSFC (tons/year)
		Emissions (tons/year)											
OGV[c]	Transit[d]	0.648	0.025	0.031	0.060	0.008	0.008	0.017	27.051	0.000	0.001	24.898	8.414
	Maneuvering[e]	0.059	0.007	0.009	0.009	0.001	0.001	0.003	3.142	0.0000	0.000	2.885	0.775
	Hoteling[f]	0.067	0.003	0.003	0.008	0.002	0.002	0.004	6.692	0.000	0.000	6.168	2.087
Tugs[g]	Maneuvering	0.068	0.001	0.001	0.017	0.002	0.002	0.000	5.341	0.0000	0.003	5.552	1.674
TOTAL		**0.8**	**0.0**	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**42.2**	**0.001**	**0.00**	**39.50**	**13.0**
BAAQMD Threshold		*10*	--	*10*	--	*15*	*10*	--	--	--	--	--	--

Notes:

a - ROG is calculated as hydrocarbons multiplied by 1.21
CARB Source: https://ww3.arb.ca.gov/msei/ordiesel/rog_tog_hcratio.xlsx

b - CO2e was calculated using the 100-year global warming potentials from the IPCC Forth Assessment Report (AR4) to remain consistent with the CalEEMod modeling and CARB's 2014 Scoping Plan Update.
CalEEMod background: http://www.aqmd.gov/docs/default-source/caleemod/02_appendix-a2016-3-2.pdf?sfvrsn=6
IPCC source: https://www.ipcc.ch/assessment-report/ar4/

c - The OGV emission calculations primarily relied upon EPA's 2020 port guidance document. The OGV fleet tier compistion, vessel transit speeds, and vessel transit distances leading to and from the Golden Gate were taken from the Port of Oakland 2017 Emission Inventory. Vehicle carrier propulsion power was taken from the 2005 Port of Benicia emission inventory. Allocation of the OGV emissions are based on 2020 San Francisco Marine Exchange berth report for vehicle carriers that demonstrated 85% of visits only make one stop in the bay, 10% make two stops, 4% make three stops, and less than a percent make 4 stops in the bay.
EPA 2020 Guidance: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P10102U0.pdf
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf
Port of Benicia 2005 Emission Inventory: https://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/Emission%20Inventory/Port%20of%20Benicia%202005%20Emissions%20Inventory%20June%202010.ashx
San Francisco Marine Exchange (SFMX) Custom Berth Report: Acquired from James Hill of the SFMX by AMPORTS on May 13, 2021.

d - Transiting calculations assume per arrival/departure distances of 8.7 nautical miles (nm) of travel outside of pilot control at cruise speed, 1.5 nm during pilot boarding proceedures at 9 knots, 52.8 nm at 13.5 knots from the Golden Gate to Antioch.
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf

e - Maneuvering activity conservatively assumed the metrics used in the Port of Oakland 2017 emission inventory: 1.33 hours inbound and 0.75 hours outbound at a 2% engine load.
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf

f - The hoteling activity is modeled as 8.1 hours of operation which is a composite that assumes 6.5 hours for general vessel visit loading operations and an additional 8 hours in the vessel over nights (i.e., 14.5 hours for a visit with an overnight). Overnighting is assumed to occur 20% of the time.

g - The tug emissions were developed using EPA 2020 emission factors. Fleet information, engine loads, and maneuvering times were taken from the Port of Oakland 2017 Emission Inventory. The emission inventory provided a detailed fleet breakout and model year information for each tug. This information was used to identify EPA emission factors and average emission factors for the fleet were applied to determine the tug emissions.
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf

Leg	Mode	Speed (kt)	Distance (nm)	Duration (hr)	Engine	Power (kw)	Load	Occurances Per Visit	Low Load Adjustment NOx	HC	CO	PM10	PM25	CO2	CH4	N2O	BSFC	SO2
Open Ocean	Transit	19.082	8.7	0.455927052	Propulsion	11531	0.831	2	1	1	1	1	1	1	1	1	1	1
Pilot Boarding	Transit	9	1.5	0.166666667	Propulsion	11531	0.087	2	1.35	2.95	2.45	1.61	1.61	1.38	1	1	1	2.42
SF Bay Transit	Transit	13.5	52.8	3.911111111	Propulsion	11531	0.294	2	1	1	1	1	1	1	1	1	1	1
SF Bay Maneuver In	Maneuver	5.510267762		1.33	Propulsion	11531	0.020	1	4.63	21.18	9.68	7.29	7.29	3.28	1	1	1	9.54
SF Bay Maneuver Out	Maneuver	5.510267762		0.75	Propulsion	11531	0.020	1	4.63	21.18	9.68	7.29	7.29	3.28	1	1	1	9.54
Open Ocean	Transit	19.082	8.7	0.455927052	Auxiliary	950	1	2	1	1	1	1	1	1	1	1	1	1
Pilot Boarding	Transit	9	1.5	0.166666667	Auxiliary	950	1	2	1	1	1	1	1	1	1	1	1	1
SF Bay Transit	Transit	15	52.8	3.52	Auxiliary	950	1	2	1	1	1	1	1	1	1	1	1	1
SF Bay Maneuver In	Maneuver	5.510267762		1.33	Auxiliary	1125	1	1	1	1	1	1	1	1	1	1	1	1
SF Bay Maneuver Out	Maneuver	5.510267762		0.75	Auxiliary	1125	1	1	1	1	1	1	1	1	1	1	1	1
SF Bay Maneuver In	Maneuver	5.510267762		1.33	Boiler	268	1	1	1	1	1	1	1	1	1	1	1	1
SF Bay Maneuver Out	Maneuver	5.510267762		0.75	Boiler	268	1	1	1	1	1	1	1	1	1	1	1	1
Berth	Hoteling	0	0	8.1	Auxiliary	800	1	1	1	1	1	1	1	1	1	1	1	1
Berth	Hoteling	0	0	8.1	Boiler	268	1	1	1	1	1	1	1	1	1	1	1	1

Leg	Emissions Per Visit (g) NOx	HC	CO	PM10	PM25	CO2	CH4	N2O	BSFC	SO2	CO2e
Open Ocean	137967.9	5239.95	12226.55	1603.413	1475.14	5179778	104.799	253.2642	1615651	3158.695	5257871
Pilot Boarding	7143.664	592.8685	1148.892	99.01033	91.0895	274157.1	4.019448	9.713665	61966.48	293.1786	277152.2
SF Bay Transit	419094.9	15917.01	37139.7	4870.57	4480.924	15734232	318.3403	769.3223	4907746	9594.937	15971449
SF Bay Maneuver In	22435.29	3897.856	4156.732	410.5307	377.6882	596702.3	3.680695	8.895013	56744.05	1058.349	599445
SF Bay Maneuver Out	12651.48	2198.039	2344.022	231.5023	212.9821	336486.2	2.07558	5.015985	31998.53	596.8132	338032.9
Open Ocean	8232.082	346.5046	952.8875	163.4046	150.3322	602659.8	6.930091	25.12158	187978.7	367.5097	610319.3
Pilot Boarding	3009.283	126.6667	348.3333	59.73344	54.95477	220305.6	2.533333	9.183333	68716.67	134.3452	223105.6
SF Bay Transit	63556.06	2675.2	7356.8	1261.57	1160.645	4652855	53.504	193.952	1451296	2837.371	4711990
SF Bay Maneuver In	14218.86	598.5	1645.875	282.2405	259.6613	1040944	11.97	43.39125	324686.3	634.7811	1054174
SF Bay Maneuver Out	8018.156	337.5	928.125	159.1582	146.4255	586998.6	6.75	24.46875	183093.8	357.9593	594459
SF Bay Maneuver In	712.88	35.644	71.288	71.88931	66.13817	342824	0.71288	26.733	106932	209.0585	350808.2
SF Bay Maneuver Out	402	20.1	40.2	40.53909	37.29596	193321.8	0.402	15.075	60300	117.8901	197824.2
Berth	61579.44	2592	7128	1222.335	1124.548	4508149	51.84	187.92	1406160	2749.127	4565445
Berth	4341.6	217.08	434.16	437.8221	402.7964	2087875	4.3416	162.81	651240	1273.213	2136501

Mode Totals

	NOx	HC	CO	PM10	PM25	CO2	CH4	N2O	BSFC	SO2	CO2e
Transit	639003.9	24898.2	59173.16	8057.702	7413.086	26663988	490.1261	1260.557	8293355	16386.04	27051887
Maneuvering	58438.67	7087.639	9186.241	1195.86	1100.191	3097277	25.59116	123.579	763754.6	2974.851	3134743
Hoteling	65921.04	2809.08	7562.16	1660.157	1527.344	6596024	56.1816	350.73	2057400	4022.34	6701946

Annual Visits 1

Visit Counts	Scaled Visits	Visit Allocations	Discrete Visits
Visits w/ 1 stop	0.9	85.5%	1
Visits w/ 2 stops	0.1	10.5%	0
Visits w/ 3 stops	0.0	3.6%	0
Visits w/4 stops	0.0	0.4%	0

Parameter	Units	Emissions NOx	HC	CO	PM10	PM25	CO2	CH4	N2O	CO2e	
Visit	(g/visit)	763363.63	34794.92	75921.56	10913.72	10040.62	36357289.13	571.90	1734.87	11114509.29	
Annual Allo.	(g/yr)	702571.57	32023.96	69875.39	10044.58	9241.02	33461900.18	526.35	1596.71	10229382.03	
Avg. Day	(lb/day)	4.24	0.19	0.42	0.06	0.06	202.11	0.00	0.01		
Annual	(tpy)	0.77	0.04	0.08	0.01	0.01	36.89	0.00	0.00	10.23	<- metric tons

Vessel Types	Operating Mode	Emissions (g/visit) NOx	HC	ROG	CO	PM10	PM25	SO2	CO2	CH4	N2O	CO2e	BSFC (g/visit)
OGV	Transit	639,004	24,898	30,127	59,173	8,058	7,413	16,386	26,663,988	490	1,261	27,051,887	8,293,355
	Maneuvering	58,439	7,088	8,576	9,186	1,196	1,100	2,975	3,097,277	26	124	3,134,743	763,755
	Hoteling	65,921	2,809	3,399	7,562	1,660	1,527	4,022	6,596,024	56	351	6,701,946	2,057,400
Tugs	Maneuvering	61,461	926	1,121	15,030	1,802	1,748	45	4,845,338	19	2,370	5,551,914	1,518,915

Control for Visits

Annual Visits	8		
Visit Counts	**Scaled Visits**	**Visit Allocations**	**Discrete Visits**
Visits w/ 1 stop	6.84	85.5%	6.84
Visits w/ 2 stops	0.84	10.5%	0.84
Visits w/ 3 stops	0.29	3.6%	0.29
Visits w/4 stops	0.03	0.4%	0.03
			8.00

Vessel Types	Operating Mode	Emissions (annual avg lb/day) NO_x	HC	ROG[a]	CO	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CH_4	N_2O	CO_2e[b]	BSFC (lb/day)
OGV[c]	Transit[d]	28.42	1.11	1.34	2.63	0.36	0.33	0.73	1185.81	0.02	0.06	1203.06	368.83
	Maneuvering[e]	2.60	0.32	0.38	0.41	0.05	0.05	0.13	137.74	0.001	0.01	139.41	33.97
	Hoteling[f]	2.93	0.12	0.15	0.34	0.07	0.07	0.18	293.34	0.002	0.02	298.05	91.50
Tugs[g]	Maneuvering	2.97	0.04	0.05	0.73	0.09	0.08	0.002	234.13	0.001	0.11	268.27	73.39
TOTAL		**36.9**	**1.6**	**1.9**	**4.1**	**0.6**	**0.5**	**1.0**	**1851.0**	**0.026**	**0.19**	**1908.79**	**567.7**
BAAQMD Threshold		*54*	--	*54*	--	*82*	*54*	--	--	--	--	--	--

Notes:

a - ROG is calculated as hydrocarbons multiplied by 1.21
CARB Source: https://ww3.arb.ca.gov/msei/ordiesel/rog_tog_hcratio.xlsx

b - CO2e was calculated using the 100-year global warming potentials from the IPCC Forth Assessment Report (AR4) to remain consistent with the CalEEMod modeling and CARB's 2014 Scoping Plan Update.
CalEEMod background: http://www.aqmd.gov/docs/default-source/caleemod/02_appendix-a2016-3-2.pdf?sfvrsn=6
IPCC source: https://www.ipcc.ch/assessment-report/ar4/

c - The OGV emission calculations primarily relied upon EPA's 2020 port guidance document. The OGV fleet tier compistion, vessel transit speeds, and vessel transit distances leading to and from the Golden Gate were taken from the Port of Oakland 2017 Emission Inventory. Vehicle carrier propulsion power was taken from the 2005 Port of Benicia emission inventory. Allocation of the OGV emissions are based on 2020 San Francisco Marine Exchange berth report for vehicle carriers that demonstrated 85% of visits only make one stop in the bay, 10% make two stops, 4% make three stops, and less than a percent make 4 stops in the bay.
EPA 2020 Guidance: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P10102U0.pdf
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf
Port of Benicia 2005 Emission Inventory: https://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/Emission%20Inventory/Port%20of%20Benicia%202005%20Emissions%20Inventory%20June%202010.ashx
San Francisco Marine Exchange (SFMX) Custom Berth Report: Acquired from James Hill of the SFMX by AMPORTS on May 13, 2021.

d - Transiting calculations assume per arrival/departure distances of 8.7 nautical miles (nm) of travel outside of pilot control at cruise speed, 1.5 nm during pilot boarding proceedures at 9 knots, 52.8 nm at 13.5 knots from the Golden Gate to Antioch.
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf

e - Maneuvering activity conservatively assumed the metrics used in the Port of Oakland 2017 emission inventory: 1.33 hours inbound and 0.75 hours outbound at a 2% engine load.
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf

f - The hoteling activity is modeled as 8.1 hours of operation which is a composite that assumes 6.5 hours for general vessel visit loading operations and an additional 8 hours in the vessel over nights (i.e., 14.5 hours for a visit with an overnight). Overnighting is assumed to occur 20% of the time.

g - The tug emissions were developed using EPA 2020 emission factors. Fleet information, engine loads, and maneuvering times were taken from the Port of Oakland 2017 Emission Inventory. The emission inventory provided a detailed fleet breakout and model year information for each tug. This information was used to identify EPA emission factors and average emission factors for the fleet were applied to determine the tug emissions.
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf

Vessel Types	Operating Mode	Emissions (tons/year) NO_x	HC	ROG[a]	CO	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CH_4	N_2O	CO_2e[b] (metric tons)	BSFC (tons/year)
OGV[c]	Transit[d]	5.186	0.202	0.245	0.480	0.065	0.060	0.133	216.411	0.004	0.010	199.180	67.311
	Maneuvering[e]	0.474	0.058	0.070	0.075	0.010	0.009	0.024	25.138	0.0002	0.001	23.081	6.199
	Hoteling[f]	0.535	0.023	0.028	0.061	0.013	0.012	0.033	53.535	0.000	0.003	49.346	16.698
Tugs[g]	Maneuvering	0.542	0.008	0.010	0.133	0.016	0.015	0.000	42.729	0.0002	0.021	44.415	13.395
TOTAL		**6.7**	**0.3**	**0.4**	**0.7**	**0.1**	**0.1**	**0.2**	**337.8**	**0.005**	**0.03**	**316.02**	**103.6**
BAAQMD Threshold		*10*	--	*10*	--	*15*	*10*	--	--	--	--	--	--

Notes:

a - ROG is calculated as hydrocarbons multiplied by 1.21
CARB Source: https://ww3.arb.ca.gov/msei/ordiesel/rog_tog_hcratio.xlsx

b - CO2e was calculated using the 100-year global warming potentials from the IPCC Forth Assessment Report (AR4) to remain consistent with the CalEEMod modeling and CARB's 2014 Scoping Plan Update.
CalEEMod background: http://www.aqmd.gov/docs/default-source/caleemod/02_appendix-a2016-3-2.pdf?sfvrsn=6
IPCC source: https://www.ipcc.ch/assessment-report/ar4/

c - The OGV emission calculations primarily relied upon EPA's 2020 port guidance document. The OGV fleet tier compistion, vessel transit speeds, and vessel transit distances leading to and from the Golden Gate were taken from the Port of Oakland 2017 Emission Inventory. Vehicle carrier propulsion power was taken from the 2005 Port of Benicia emission inventory. Allocation of the OGV emissions are based on 2020 San Francisco Marine Exchange berth report for vehicle carriers that demonstrated 85% of visits only make one stop in the bay, 10% make two stops, 4% make three stops, and less than a percent make 4 stops in the bay.
EPA 2020 Guidance: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P10102U0.pdf
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf
Port of Benicia 2005 Emission Inventory: https://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/Emission%20Inventory/Port%20of%20Benicia%202005%20Emissions%20Inventory%20June%202010.ashx
San Francisco Marine Exchange (SFMX) Custom Berth Report: Acquired from James Hill of the SFMX by AMPORTS on May 13, 2021.

d - Transiting calculations assume per arrival/departure distances of 8.7 nautical miles (nm) of travel outside of pilot control at cruise speed, 1.5 nm during pilot boarding proceedures at 9 knots, 52.8 nm at 13.5 knots from the Golden Gate to Antioch.
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf

e - Maneuvering activity conservatively assumed the metrics used in the Port of Oakland 2017 emission inventory: 1.33 hours inbound and 0.75 hours outbound at a 2% engine load.
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf

f - The hoteling activity is modeled as 8.1 hours of operation which is a composite that assumes 6.5 hours for general vessel visit loading operations and an additional 8 hours in the vessel over nights (i.e., 14.5 hours for a visit with an overnight). Overnighting is assumed to occur 20% of the time.

g - The tug emissions were developed using EPA 2020 emission factors. Fleet information, engine loads, and maneuvering times were taken from the Port of Oakland 2017 Emission Inventory. The emission inventory provided a detailed fleet breakout and model year information for each tug. This information was used to identify EPA emission factors and average emission factors for the fleet were applied to determine the tug emissions.
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf

Leg	Mode	Speed (kt)	Distance (nm)	Duration (hr)	Engine	Power (kw)	Load	Occurances Per Visit
Open Ocean	Transit	19.082	8.7	0.455927052	Propulsion	11531	0.831	2
Pilot Boarding	Transit	9	1.5	0.166666667	Propulsion	11531	0.087	2
SF Bay Transit	Transit	13.5	52.8	3.911111111	Propulsion	11531	0.294	2
SF Bay Maneuver In	Maneuver	5.510267762		1.33	Propulsion	11531	0.020	1
SF Bay Maneuver Out	Maneuver	5.510267762		0.75	Propulsion	11531	0.020	1
Open Ocean	Transit	19.082	8.7	0.455927052	Auxiliary	950	1	2
Pilot Boarding	Transit	9	1.5	0.166666667	Auxiliary	950	1	2
SF Bay Transit	Transit	15	52.8	3.52	Auxiliary	950	1	2
SF Bay Maneuver In	Maneuver	5.510267762		1.33	Auxiliary	1125	1	1
SF Bay Maneuver Out	Maneuver	5.510267762		0.75	Auxiliary	1125	1	1
SF Bay Maneuver In	Maneuver	5.510267762		1.33	Boiler	268	1	1
SF Bay Maneuver Out	Maneuver	5.510267762		0.75	Boiler	268	1	1
Berth	Hoteling	0	0	8.1	Auxiliary	800	1	1
Berth	Hoteling	0	0	8.1	Boiler	268	1	1

Leg	Low Load Adjustment									
	NOx	HC	CO	PM10	PM25	CO2	CH4	N2O	BSFC	SO2
Open Ocean	1	1	1	1	1	1	1	1	1	1
Pilot Boarding	1.35	2.95	2.45	1.61	1.61	1.38	1	1	1	2.42
SF Bay Transit	1	1	1	1	1	1	1	1	1	1
SF Bay Maneuver In	4.63	21.18	9.68	7.29	7.29	3.28	1	1	1	9.54
SF Bay Maneuver Out	4.63	21.18	9.68	7.29	7.29	3.28	1	1	1	9.54
Open Ocean	1	1	1	1	1	1	1	1	1	1
Pilot Boarding	1	1	1	1	1	1	1	1	1	1
SF Bay Transit	1	1	1	1	1	1	1	1	1	1
SF Bay Maneuver In	1	1	1	1	1	1	1	1	1	1
SF Bay Maneuver Out	1	1	1	1	1	1	1	1	1	1
SF Bay Maneuver In	1	1	1	1	1	1	1	1	1	1
SF Bay Maneuver Out	1	1	1	1	1	1	1	1	1	1
Berth	1	1	1	1	1	1	1	1	1	1
Berth	1	1	1	1	1	1	1	1	1	1

Leg	Emissions Per Visit (g)										
	NOx	HC	CO	PM10	PM25	CO2	CH4	N2O	BSFC	SO2	CO2e
Open Ocean	137967.9	5239.95	12226.55	1603.413	1475.14	5179778	104.799	253.2642	1615651	3158.695	5257871
Pilot Boarding	7143.664	592.8685	1148.892	99.01033	91.0895	274157.1	4.019448	9.713665	61966.48	293.1786	277152.2
SF Bay Transit	419094.9	15917.01	37139.7	4870.57	4480.924	15734232	318.3403	769.3223	4907746	9594.937	15971449
SF Bay Maneuver In	22435.29	3897.856	4156.732	410.5307	377.6882	596702.3	3.680695	8.895013	56744.05	1058.349	599445
SF Bay Maneuver Out	12651.48	2198.039	2344.022	231.5023	212.9821	336486.2	2.07558	5.015985	31998.53	596.8132	338032.9
Open Ocean	8232.082	346.5046	952.8875	163.4046	150.3322	602659.8	6.930091	25.12158	187978.7	367.5097	610319.3
Pilot Boarding	3009.283	126.6667	348.3333	59.73344	54.95477	220305.6	2.533333	9.183333	68716.67	134.3452	223105.6
SF Bay Transit	63556.06	2675.2	7356.8	1261.57	1160.645	4652855	53.504	193.952	1451296	2837.371	4711990
SF Bay Maneuver In	14218.86	598.5	1645.875	282.2405	259.6613	1040944	11.97	43.39125	324686.3	634.7811	1054174
SF Bay Maneuver Out	8018.156	337.5	928.125	159.1582	146.4255	586998.6	6.75	24.46875	183093.8	357.9593	594459
SF Bay Maneuver In	712.88	35.644	71.288	71.88931	66.13817	342824	0.71288	26.733	106932	209.0585	350808.2
SF Bay Maneuver Out	402	20.1	40.2	40.53909	37.29596	193321.8	0.402	15.075	60300	117.8901	197824.2
Berth	61579.44	2592	7128	1222.335	1124.548	4508149	51.84	187.92	1406160	2749.127	4565445
Berth	4341.6	217.08	434.16	437.8221	402.7964	2087875	4.3416	162.81	651240	1273.213	2136501

Mode Totals

	NOx	HC	CO	PM10	PM25	CO2	CH4	N2O	BSFC	SO2	CO2e
Transit	639003.9	24898.2	59173.16	8057.702	7413.086	26663988	490.1261	1260.557	8293355	16386.04	27051887
Maneuvering	58438.67	7087.639	9186.241	1195.86	1100.191	3097277	25.59116	123.579	763754.6	2974.851	3134743
Hoteling	65921.04	2809.08	7562.16	1660.157	1527.344	6596024	56.1816	350.73	2057400	4022.34	6701946

Annual Visits 8

Visit Counts	Scaled Visits	Visit Allocations	Discrete Visits
Visits w/ 1 stop	6.8	85.5%	7
Visits w/ 2 stops	0.8	10.5%	1
Visits w/ 3 stops	0.3	3.6%	0
Visits w/4 stops	0.0	0.4%	0

Parameter	Units	Emissions								
		NOx	HC	CO	PM10	PM25	CO2	CH4	N2O	CO2e
Visit	(g/visit)	763363.63	34794.92	75921.56	10913.72	10040.62	36357289.13	571.90	1734.87	11114509.29
Annual Allo.	(g/yr)	5620572.55	256191.64	559003.10	80356.66	73928.12	267695201.44	4210.84	12773.65	81835056.28
Avg. Day	(lb/day)	33.95	1.55	3.38	0.49	0.45	1616.90	0.03	0.08	
Annual	(tpy)	6.20	0.28	0.62	0.09	0.08	295.08	0.00	0.01	81.84 <- metric tons

Engine Group	Fuel Type	Tier	Engine Type	Pollutant	EF	Units	Source
Propulsion	MGO/MDO	Tier 0	SSD	NOx	17	g/kWh	EPA 2020 Table 3.5
Propulsion	MGO/MDO	Tier I	SSD	NOx	16	g/kWh	EPA 2020 Table 3.5
Propulsion	MGO/MDO	Tier II	SSD	NOx	14.4	g/kWh	EPA 2020 Table 3.5
Propulsion	MGO/MDO	Tier III	SSD	NOx	3.4	g/kWh	EPA 2020 Table 3.5
Auxiliary	MGO/MDO	Tier 0	MSD	NOx	10.9	g/kWh	EPA 2020 Table 3.5
Auxiliary	MGO/MDO	Tier I	MSD	NOx	9.8	g/kWh	EPA 2020 Table 3.5
Auxiliary	MGO/MDO	Tier II	MSD	NOx	7.7	g/kWh	EPA 2020 Table 3.5
Auxiliary	MGO/MDO	Tier III	MSD	NOx	2	g/kWh	EPA 2020 Table 3.5
Propulsion	MGO/MDO	POAK Composite	SSD	NOx	15.798	g/kWh	Calculated based on POAK Fleet Composition
Auxiliary	MGO/MDO	POAK Composite	MSD	NOx	9.503	g/kWh	Calculated based on POAK Fleet Composition
Boiler	MGO/MDO	Any	Boiler	NOx	2	g/kWh	EPA 2020 Table 3.5
Propulsion	MGO/MDO	Any	SSD	BSFC	185	g/kWh	EPA 2020 Table 3.6
Auxiliary	MGO/MDO	Any	MSD	BSFC	217	g/kWh	EPA 2020 Table 3.6
Boiler	MGO/MDO	Any	Boiler	BSFC	300	g/kWh	EPA 2020 Table 3.6
Propulsion	Any	Any	SSD	HC	0.6	g/kWh	EPA 2020 Table 3.8
Auxiliary	Any	Any	MSD	HC	0.4	g/kWh	EPA 2020 Table 3.8
Boiler	Any	Any	Boiler	HC	0.1	g/kWh	EPA 2020 Table 3.8
Propulsion	Any	Any	SSD	CO	1.4	g/kWh	EPA 2020 Table 3.8
Auxiliary	Any	Any	MSD	CO	1.1	g/kWh	EPA 2020 Table 3.8
Boiler	Any	Any	Boiler	CO	0.2	g/kWh	EPA 2020 Table 3.8
Propulsion	MGO/MDO	Any	SSD	N2O	0.029	g/kWh	EPA 2020 Table 3.9
Auxiliary	MGO/MDO	Any	MSD	N2O	0.029	g/kWh	EPA 2020 Table 3.9
Boiler	MGO/MDO	Any	Boiler	N2O	0.075	g/kWh	EPA 2020 Table 3.9
Propulsion	MGO/MDO	Any	SSD	PM10	0.18359865	g/kWh	EPA 2020 Equation 3.3
Auxiliary	MGO/MDO	Any	MSD	PM10	0.18863193	g/kWh	EPA 2020 Equation 3.3
Boiler	MGO/MDO	Any	Boiler	PM10	0.201687	g/kWh	EPA 2020 Equation 3.3
Propulsion	MGO/MDO	Any	SSD	PM25	0.168910758	g/kWh	Calculated as 92% of PM10 per EPA 2020
Auxiliary	MGO/MDO	Any	MSD	PM25	0.173541376	g/kWh	Calculated as 92% of PM10 per EPA 2020
Boiler	MGO/MDO	Any	Boiler	PM25	0.18555204	g/kWh	Calculated as 92% of PM10 per EPA 2020
Propulsion	MGO/MDO	Any	SSD	CO2	593.11	g/kWh	EPA 2020 Equation 3.4
Auxiliary	MGO/MDO	Any	MSD	CO2	695.702	g/kWh	EPA 2020 Equation 3.4
Boiler	MGO/MDO	Any	Boiler	CO2	961.8	g/kWh	EPA 2020 Equation 3.4
Propulsion	MGO/MDO	Any	SSD	SO2	0.3616861	g/kWh	EPA 2020 Equation 3.5
Auxiliary	MGO/MDO	Any	MSD	SO2	0.42424802	g/kWh	EPA 2020 Equation 3.5
Boiler	MGO/MDO	Any	Boiler	SO2	0.586518	g/kWh	EPA 2020 Equation 3.5
Propulsion	Any	Any	SSD	CH4	0.012	g/kWh	Calculated as 2% of HC per EPA 2020
Auxiliary	Any	Any	MSD	CH4	0.008	g/kWh	Calculated as 2% of HC per EPA 2020
Boiler	Any	Any	Boiler	CH4	0.002	g/kWh	Calculated as 2% of HC per EPA 2020

Load	NOx	HC	CO	PM10	PM25	CO2	SO2
2%	4.63	21.18	9.68	7.29	7.29	3.28	9.54
3%	2.92	11.68	6.46	4.33	4.33	2.44	6.38
4%	2.21	7.71	4.86	3.09	3.09	2.01	4.79
5%	1.83	5.61	3.89	2.44	2.44	1.76	3.85
6%	1.6	4.35	3.25	2.04	2.04	1.59	3.21
7%	1.45	3.52	2.79	1.79	1.79	1.47	2.76
8%	1.35	2.95	2.45	1.61	1.61	1.38	2.42
9%	1.27	2.52	2.18	1.48	1.48	1.31	2.16
10%	1.22	2.2	1.96	1.38	1.38	1.25	1.95
11%	1.17	1.96	1.79	1.3	1.3	1.21	1.78
12%	1.14	1.76	1.64	1.24	1.24	1.17	1.63
13%	1.11	1.6	1.52	1.19	1.19	1.14	1.51
14%	1.08	1.47	1.41	1.15	1.15	1.11	1.41
15%	1.06	1.36	1.32	1.11	1.11	1.08	1.32
16%	1.05	1.26	1.24	1.08	1.08	1.06	1.24
17%	1.03	1.18	1.17	1.06	1.06	1.04	1.17
18%	1.02	1.11	1.11	1.04	1.04	1.03	1.11
19%	1.01	1.05	1.05	1.02	1.02	1.01	1.05
20%	1	1	1	1	1	1	1

Soure: EPA 2020

Load	Pollutant	Value
0.02	NOx	4.63
0.02	HC	21.18
0.02	CO	9.68
0.02	PM10	7.29
0.02	PM25	7.29
0.02	CO2	3.28
0.02	SO2	9.54
0.03	NOx	2.92
0.03	HC	11.68
0.03	CO	6.46
0.03	PM10	4.33
0.03	PM25	4.33
0.03	CO2	2.44
0.03	SO2	6.38
0.04	NOx	2.21
0.04	HC	7.71
0.04	CO	4.86
0.04	PM10	3.09
0.04	PM25	3.09
0.04	CO2	2.01
0.04	SO2	4.79
0.05	NOx	1.83
0.05	HC	5.61
0.05	CO	3.89
0.05	PM10	2.44
0.05	PM25	2.44
0.05	CO2	1.76
0.05	SO2	3.85
0.06	NOx	1.6
0.06	HC	4.35
0.06	CO	3.25
0.06	PM10	2.04
0.06	PM25	2.04
0.06	CO2	1.59
0.06	SO2	3.21
0.07	NOx	1.45
0.07	HC	3.52
0.07	CO	2.79
0.07	PM10	1.79
0.07	PM25	1.79
0.07	CO2	1.47
0.07	SO2	2.76
0.08	NOx	1.35
0.08	HC	2.95
0.08	CO	2.45
0.08	PM10	1.61

0.08	PM25	1.61
0.08	CO2	1.38
0.08	SO2	2.42
0.09	NOx	1.27
0.09	HC	2.52
0.09	CO	2.18
0.09	PM10	1.48
0.09	PM25	1.48
0.09	CO2	1.31
0.09	SO2	2.16
0.1	NOx	1.22
0.1	HC	2.2
0.1	CO	1.96
0.1	PM10	1.38
0.1	PM25	1.38
0.1	CO2	1.25
0.1	SO2	1.95
0.11	NOx	1.17
0.11	HC	1.96
0.11	CO	1.79
0.11	PM10	1.3
0.11	PM25	1.3
0.11	CO2	1.21
0.11	SO2	1.78
0.12	NOx	1.14
0.12	HC	1.76
0.12	CO	1.64
0.12	PM10	1.24
0.12	PM25	1.24
0.12	CO2	1.17
0.12	SO2	1.63
0.13	NOx	1.11
0.13	HC	1.6
0.13	CO	1.52
0.13	PM10	1.19
0.13	PM25	1.19
0.13	CO2	1.14
0.13	SO2	1.51
0.14	NOx	1.08
0.14	HC	1.47
0.14	CO	1.41
0.14	PM10	1.15
0.14	PM25	1.15
0.14	CO2	1.11
0.14	SO2	1.41
0.15	NOx	1.06
0.15	HC	1.36

0.15	CO	1.32
0.15	PM10	1.11
0.15	PM25	1.11
0.15	CO2	1.08
0.15	SO2	1.32
0.16	NOx	1.05
0.16	HC	1.26
0.16	CO	1.24
0.16	PM10	1.08
0.16	PM25	1.08
0.16	CO2	1.06
0.16	SO2	1.24
0.17	NOx	1.03
0.17	HC	1.18
0.17	CO	1.17
0.17	PM10	1.06
0.17	PM25	1.06
0.17	CO2	1.04
0.17	SO2	1.17
0.18	NOx	1.02
0.18	HC	1.11
0.18	CO	1.11
0.18	PM10	1.04
0.18	PM25	1.04
0.18	CO2	1.03
0.18	SO2	1.11
0.19	NOx	1.01
0.19	HC	1.05
0.19	CO	1.05
0.19	PM10	1.02
0.19	PM25	1.02
0.19	CO2	1.01
0.19	SO2	1.05
0.2	NOx	1
0.2	HC	1
0.2	CO	1
0.2	PM10	1
0.2	PM25	1
0.2	CO2	1
0.2	SO2	1

Parameter	Value	Source
Tugs Per Visit	2	Typical based on SFMX data sample for April 2020
Maneuver Time In	1.33	POAK 2017 EI
Maneuver Time Out	0.75	POAK 2017 EI
Load Propulsion	0.31	POAK 2005, 2012, 2015, and 2017 Eis and POLA 2011 EI
Load Auxiliary	0.43	POAK 2005, 2012, 2015, and 2017 Eis and POLA 2011 EI

Mode	Nox	PM10	PM25	BC	HC	VOC	CH4	CO	CO2	N2O	BSFC	SO2	CO2e	
Propulsion In	37743.32	1119.80	1086.21	836.38	545.30	574.20	10.91	9405.25	2958603.08	1446.84	927461.78	27.20	3390034.2	
Propulsion Out	21283.83	631.47	612.52	471.64	307.50	323.80	6.15	5303.71	1668385.20	815.89	523004.76	15.34	1911673.4	
Auxiliary In	1556.35	28.38	27.53	21.20	41.16	43.34	0.82	180.05	122516.96	59.91	38406.57	1.13	140391.98	
Auxiliary Out	877.64	22.20	21.54	16.58	32.19	33.90	0.64	140.84	95832.45	46.86	30041.52	0.88	109814.25	
TOTAL (g/visit)	61461.13	1801.86	1747.80	1345.81	926.15	975.23	18.52	15029.84	4845337.69	2369.51	1518914.64	44.54	5551913.80	
Avg Daily (lb/day)	2.97	0.09	0.08	0.07	0.04	0.05	0.00	0.73	234.13	0.11	73.39	0.002		
Annual (tpy)	0.54	0.02	0.02	0.01	0.01	0.01	0.00	0.13	42.73	0.02	13.39	0.000	44.415	MTCO2e

Name	ModelYr	Attribute	Value	Engine	NOx (g/kWh)	PM10 & DPM10 (g/kWh)	PM2.5 & DPM2.5 (g/kWh)	BC (g/kWh)	HC (g/kWh)	VOC (g/kWh)	CH4 (g/kWh)	CO (g/kWh)
AMNAV Maritime Services Patricia Ann	2008	PropPow	5080	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
AMNAV Maritime Services Patricia Ann	2008	AuxPow	210	Auxiliary	5.962361954	0.153565047	0.148958096	0.114697734	0.240601621	0.253353506	0.004812032	0.929874671
AMNAV Maritime Services Revolution	2006	PropPow	5080	Propulsion	10.55	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
AMNAV Maritime Services Revolution	2006	AuxPow	210	Auxiliary	6.104964927	0.156609567	0.15191128	0.116971686	0.243423433	0.256324875	0.004868469	0.962629855
AMNAV Maritime Services Sandra Hughes	2006	PropPow	5080	Propulsion	10.55	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
AMNAV Maritime Services Sandra Hughes	2006	AuxPow	210	Auxiliary	6.104964927	0.156609567	0.15191128	0.116971686	0.243423433	0.256324875	0.004868469	0.962629855
AMNAV Maritime Services Liberty	2008	PropPow	3300	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
AMNAV Maritime Services Liberty	2008	AuxPow	210	Auxiliary	5.962361954	0.153565047	0.148958096	0.114697734	0.240601621	0.253353506	0.004812032	0.929874671
AMNAV Maritime Services Patriot	2006	PropPow	4300	Propulsion	10.55	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
AMNAV Maritime Services Patriot	2006	AuxPow	210	Auxiliary	6.104964927	0.156609567	0.15191128	0.116971686	0.243423433	0.256324875	0.004868469	0.962629855
BayDelta Delta Billie	2009	PropPow	6712	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
BayDelta Delta Billie	2009	AuxPow	215	Auxiliary	5.962361954	0.150993805	0.146463991	0.112777273	0.234803004	0.247247564	0.00469606	0.929874671
BayDelta Delta Cathryn	2009	PropPow	6712	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
BayDelta Delta Cathryn	2009	AuxPow	215	Auxiliary	5.962361954	0.150993805	0.146463991	0.112777273	0.234803004	0.247247564	0.00469606	0.929874671
BayDelta Delta Audrey	2014	PropPow	6712	Propulsion	1.3	0.179579784	0.174192391	0.134128141	0.066121522	0.069625963	0.00132243	2
BayDelta Delta Audrey	2014	AuxPow	215	Auxiliary	4.579829478	0.084744322	0.082201993	0.063295534	0.123581931	0.130131773	0.002471639	0.929874671
Crowley (BayDelta) Valor	2007	PropPow	6772	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
Crowley (BayDelta) Valor	2007	AuxPow	215	Auxiliary	5.962361954	0.153565047	0.148958096	0.114697734	0.240601621	0.253353506	0.004812032	0.929874671
Crowley (BayDelta) Goliah	2013	PropPow	5150	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
Crowley (BayDelta) Goliah	2013	AuxPow	215	Auxiliary	5.66128332	0.127551538	0.123724992	0.095268244	0.196412337	0.206822191	0.003928247	0.929874671
Foss (AMNAV) Keegan Foss	1998	PropPow	3900	Propulsion	13.36	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
Foss (AMNAV) Keegan Foss	1998	AuxPow	198	Auxiliary	10.08055009	0.291669047	0.282918976	0.217847611	0.287121677	0.302339125	0.005742434	1.569098173
Foss (AMNAV) Pacific Star	2008	PropPow	6610	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
Foss (AMNAV) Pacific Star	2008	AuxPow	198	Auxiliary	5.962361954	0.153565047	0.148958096	0.114697734	0.240601621	0.253353506	0.004812032	0.929874671
Foss (AMNAV) Caden Foss	2017	PropPow	6772	Propulsion	1.3	0.046121522	0.044737876	0.034448165	0.017756956	0.018698075	0.000355139	2
Foss (AMNAV) Caden Foss	2017	AuxPow	365	Auxiliary	4.579829478	0.084744322	0.082201993	0.063295534	0.123581931	0.130131773	0.002471639	0.929874671
Foss (AMNAV) America	2008	PropPow	6610	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
Foss (AMNAV) America	2008	AuxPow	198	Auxiliary	5.962361954	0.153565047	0.148958096	0.114697734	0.240601621	0.253353506	0.004812032	0.929874671
Foss (AMNAV) Lynn Marie	2001	PropPow	6250	Propulsion	13.36	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
Foss (AMNAV) Lynn Marie	2001	AuxPow	210	Auxiliary	10.08055009	0.291669047	0.282918976	0.217847611	0.287121677	0.302339125	0.005742434	1.569098173
Foss (AMNAV) Point Fermin	2006	PropPow	3500	Propulsion	10.55	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
Foss (AMNAV) Point Fermin	2006	AuxPow	198	Auxiliary	6.104964927	0.156609567	0.15191128	0.116971686	0.243423433	0.256324875	0.004868469	0.962629855
Foss (AMNAV) Point Vicente	2006	PropPow	3500	Propulsion	10.55	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
Foss (AMNAV) Point Vicente	2006	AuxPow	198	Auxiliary	6.104964927	0.156609567	0.15191128	0.116971686	0.243423433	0.256324875	0.004868469	0.962629855
Starlight Marine Services Ahbra Franco	2013	PropPow	6850	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
Starlight Marine Services Ahbra Franco	2013	AuxPow	290	Auxiliary	5.66128332	0.127551538	0.123724992	0.095268244	0.196412337	0.206822191	0.003928247	0.929874671
Starlight Marine Services Z-3	2012	PropPow	4000	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
Starlight Marine Services Z-3	2012	AuxPow	204	Auxiliary	5.923469261	0.148340787	0.143890563	0.110795734	0.229858448	0.242040946	0.004597169	0.929874671
Starlight Marine Services Z-4	2012	PropPow	4000	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
Starlight Marine Services Z-4	2012	AuxPow	204	Auxiliary	5.923469261	0.148340787	0.143890563	0.110795734	0.229858448	0.242040946	0.004597169	0.929874671
Starlight Marine Services Z-5	2012	PropPow	4000	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
Starlight Marine Services Z-5	2012	AuxPow	204	Auxiliary	5.923469261	0.148340787	0.143890563	0.110795734	0.229858448	0.242040946	0.004597169	0.929874671

Engine	EnginePow	NOx (g/kWh)	PM10 & DPM10 (g/kWh)	PM2.5 & DPM2.5 (g/kWh)	BC (g/kWh)	HC (g/kWh)	VOC (g/kWh)	CH4 (g/kWh)	CO (g/kWh)	CO2	N2O	BSFC	SO2
Auxiliary	218.6666667	6.222623422	0.15741966	0.15269707	0.117576744	0.228263739	0.240361717	0.004565275	0.998551953	679.47	0.33228	213	0.00625
Propulsion	5280.47619	8.668095238	0.25717257	0.249457393	0.192082193	0.125232308	0.131869621	0.002504646	2.16	679.47	0.33228	213	0.00625

Name	ModelYr	PropPow	AuxPow	Tier
AMNAV Maritime Services Patricia Ann	2008	5,080	210	Tier 2
AMNAV Maritime Services Revolution	2006	5,080	210	Tier 1
AMNAV Maritime Services Sandra Hughes	2006	5,080	210	Tier 1
AMNAV Maritime Services Liberty	2008	3,300	210	Tier 2
AMNAV Maritime Services Patriot	2006	4,300	210	Tier 1
BayDelta Delta Billie	2009	6,712	215	Tier 2
BayDelta Delta Cathryn	2009	6,712	215	Tier 2
BayDelta Delta Audrey	2014	6,712	215	Tier 3
Crowley (BayDelta) Valor	2007	6,772	215	Tier 1
Crowley (BayDelta) Goliah	2013	5,150	215	Tier 3
Foss (AMNAV) Keegan Foss	1998	3,900	198	Tier 2 Low NOx EMD
Foss (AMNAV) Pacific Star	2008	6,610	198	Tier 1
Foss (AMNAV) Caden Foss	2017	6,772	365	Tier 4
Foss (AMNAV) America	2008	6,610	198	Tier 2 Low NOx EMD
Foss (AMNAV) Lynn Marie	2001	6,250	210	Tier 1
Foss (AMNAV) Point Fermin	2006	3,500	198	Bunkering, Tier 1
Foss (AMNAV) Point Vicente	2006	3,500	198	Bunkering, Tier 1
Starlight Marine Services Ahbra Franco	2013	6,850	290	Tier 3
Starlight Marine Services Z-3	2012	4,000	204	Tier 2
Starlight Marine Services Z-4	2012	4,000	204	Tier 2
Starlight Marine Services Z-5	2012	4,000	204	Tier 2

Source: POAK 2017 Emission Inventory

Year Range	Model Year Min Inclusive	Model Year Max Inclusive	Power Range (kW)	Power Min (kW)	Power Max Inclusive (kW)	Engine Group	NOx (g/kWh)	PM10 & DPM10 (g/kWh)	PM2.5 & DPM2.5 (g/kWh)	BC (g/kWh)	HC (g/kWh)	VOC (g/kWh)	CH4 (g/kWh)	CO (g/kWh)
1998	0	1998	0 < kW ≤ 8	0	8	All	13.4102	1.212787437	1.176403814	0.905830937	2.01153	2.11814109	0.0402306	5
1998	0	1998	8 < kW ≤ 19	8	19	All	11.39867	1.078685437	1.046324874	0.805670153	2.279734	2.400559902	0.04559468	5
1998	0	1998	19 < kW ≤ 37	19	37	All	9.253038	0.944583437	0.916245934	0.705509369	2.413836	2.541769308	0.04827672	5
1998	0	1998	37 < kW ≤ 600	37	600	Propulsion	10.07572974	0.242182876	0.23491739	0.18088639	0.274411656	0.288955474	0.005488233	1.61959494
1998	0	1998	37 < kW ≤ 600	37	600	Auxiliary	10.08055009	0.291669047	0.282918976	0.217847611	0.287121677	0.302339125	0.005742434	1.569098173
1998	0	1998	600 < kW ≤ 1000	600	1000	Propulsion	10.24709501	0.207585212	0.201357656	0.155045395	0.266425092	0.280545622	0.005328502	1.654886508
1998	0	1998	600 < kW ≤ 1000	600	1000	Auxiliary	10.40635063	0.211946637	0.205588238	0.158302943	0.27	0.28431	0.0054	1.621905189
1998	0	1998	1000 < kW ≤ 1400	1000	1400	Propulsion	10.45348733	0.217246941	0.210729533	0.162261741	0.257304406	0.27094154	0.005146088	1.710114255
1998	0	1998	1000 < kW ≤ 1400	1000	1400	Auxiliary	10.94720285	0.190999344	0.185269363	0.14265741	0.27	0.28431	0.0054	1.784160855
1998	0	1998	1400 < kW ≤ 2000	1400	2000	Propulsion	11.79937468	0.196717762	0.190816229	0.146928497	0.22393434	0.23580286	0.004478687	2.030328298
1998	0	1998	1400 < kW ≤ 2000	1400	2000	Auxiliary	11	0.189943401	0.184245099	0.141868726	0.27	0.28431	0.0054	1.8
1998	0	1998	2000 < kW ≤ 3700	2000	3700	Propulsion	13.36	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
1998	0	1998	3700 < kW ≤ 999999	3700	999999	Propulsion	13.36	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
1999	1999	1999	0 < kW ≤ 8	0	8	All	13.4102	1.212787437	1.176403814	0.905830937	2.01153	2.11814109	0.0402306	5
1999	1999	1999	8 < kW ≤ 19	8	19	All	11.39867	1.078685437	1.046324874	0.805670153	2.279734	2.400559902	0.04559468	5
1999	1999	1999	19 < kW ≤ 37	19	37	All	6.3430246	0.327714237	0.31788281	0.244769764	0.3754856	0.395386337	0.007509712	1.53
1999	1999	1999	37 < kW ≤ 600	37	600	Propulsion	10.07572974	0.242182876	0.23491739	0.18088639	0.274411656	0.288955474	0.005488233	1.61959494
1999	1999	1999	37 < kW ≤ 600	37	600	Auxiliary	10.08055009	0.291669047	0.282918976	0.217847611	0.287121677	0.302339125	0.005742434	1.569098173
1999	1999	1999	600 < kW ≤ 1000	600	1000	Propulsion	10.24709501	0.207585212	0.201357656	0.155045395	0.266425092	0.280545622	0.005328502	1.654886508
1999	1999	1999	600 < kW ≤ 1000	600	1000	Auxiliary	10.40635063	0.211946637	0.205588238	0.158302943	0.27	0.28431	0.0054	1.621905189
1999	1999	1999	1000 < kW ≤ 1400	1000	1400	Propulsion	10.45348733	0.217246941	0.210729533	0.162261741	0.257304406	0.27094154	0.005146088	1.710114255
1999	1999	1999	1000 < kW ≤ 1400	1000	1400	Auxiliary	10.94720285	0.190999344	0.185269363	0.14265741	0.27	0.28431	0.0054	1.784160855
1999	1999	1999	1400 < kW ≤ 2000	1400	2000	Propulsion	11.79937468	0.196717762	0.190816229	0.146928497	0.22393434	0.23580286	0.004478687	2.030328298
1999	1999	1999	1400 < kW ≤ 2000	1400	2000	Auxiliary	11	0.189943401	0.184245099	0.141868726	0.27	0.28431	0.0054	1.8
1999	1999	1999	2000 < kW ≤ 3700	2000	3700	Propulsion	13.36	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
1999	1999	1999	3700 < kW ≤ 999999	3700	999999	Propulsion	13.36	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
2000	2000	2000	0 < kW ≤ 8	0	8	All	7.0135346	0.475226437	0.460969644	0.354946626	1.0191752	1.073191486	0.020383504	4.11
2000	2000	2000	8 < kW ≤ 19	8	19	All	5.9541288	0.233842837	0.226827552	0.174657215	0.5900488	0.621321386	0.011800976	2.16
2000	2000	2000	19 < kW ≤ 37	19	37	All	6.3430246	0.327714237	0.31788281	0.244769764	0.3754856	0.395386337	0.007509712	1.53
2000	2000	2000	37 < kW ≤ 600	37	600	Propulsion	10.07572974	0.242182876	0.23491739	0.18088639	0.274411656	0.288955474	0.005488233	1.61959494
2000	2000	2000	37 < kW ≤ 600	37	600	Auxiliary	10.08055009	0.291669047	0.282918976	0.217847611	0.287121677	0.302339125	0.005742434	1.569098173
2000	2000	2000	600 < kW ≤ 1000	600	1000	Propulsion	10.24709501	0.207585212	0.201357656	0.155045395	0.266425092	0.280545622	0.005328502	1.654886508
2000	2000	2000	600 < kW ≤ 1000	600	1000	Auxiliary	10.40635063	0.211946637	0.205588238	0.158302943	0.27	0.28431	0.0054	1.621905189
2000	2000	2000	1000 < kW ≤ 1400	1000	1400	Propulsion	10.45348733	0.217246941	0.210729533	0.162261741	0.257304406	0.27094154	0.005146088	1.710114255
2000	2000	2000	1000 < kW ≤ 1400	1000	1400	Auxiliary	10.94720285	0.190999344	0.185269363	0.14265741	0.27	0.28431	0.0054	1.784160855
2000	2000	2000	1400 < kW ≤ 2000	1400	2000	Propulsion	11.79937468	0.196717762	0.190816229	0.146928497	0.22393434	0.23580286	0.004478687	2.030328298
2000	2000	2000	1400 < kW ≤ 2000	1400	2000	Auxiliary	11	0.189943401	0.184245099	0.141868726	0.27	0.28431	0.0054	1.8
2000	2000	2000	2000 < kW ≤ 3700	2000	3700	Propulsion	13.36	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
2000	2000	2000	3700 < kW ≤ 999999	3700	999999	Propulsion	13.36	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
2001	2001	2001	0 < kW ≤ 8	0	8	All	7.0135346	0.475226437	0.460969644	0.354946626	1.0191752	1.073191486	0.020383504	4.11
2001	2001	2001	8 < kW ≤ 19	8	19	All	5.9541288	0.233842837	0.226827552	0.174657215	0.5900488	0.621321386	0.011800976	2.16
2001	2001	2001	19 < kW ≤ 37	19	37	All	6.3430246	0.327714237	0.31788281	0.244769764	0.3754856	0.395386337	0.007509712	1.53
2001	2001	2001	37 < kW ≤ 600	37	600	Propulsion	10.07572974	0.242182876	0.23491739	0.18088639	0.274411656	0.288955474	0.005488233	1.61959494
2001	2001	2001	37 < kW ≤ 600	37	600	Auxiliary	10.08055009	0.291669047	0.282918976	0.217847611	0.287121677	0.302339125	0.005742434	1.569098173
2001	2001	2001	600 < kW ≤ 1000	600	1000	Propulsion	10.24709501	0.207585212	0.201357656	0.155045395	0.266425092	0.280545622	0.005328502	1.654886508
2001	2001	2001	600 < kW ≤ 1000	600	1000	Auxiliary	10.40635063	0.211946637	0.205588238	0.158302943	0.27	0.28431	0.0054	1.621905189
2001	2001	2001	1000 < kW ≤ 1400	1000	1400	Propulsion	10.45348733	0.217246941	0.210729533	0.162261741	0.257304406	0.27094154	0.005146088	1.710114255
2001	2001	2001	1000 < kW ≤ 1400	1000	1400	Auxiliary	10.94720285	0.190999344	0.185269363	0.14265741	0.27	0.28431	0.0054	1.784160855
2001	2001	2001	1400 < kW ≤ 2000	1400	2000	Propulsion	11.79937468	0.196717762	0.190816229	0.146928497	0.22393434	0.23580286	0.004478687	2.030328298
2001	2001	2001	1400 < kW ≤ 2000	1400	2000	Auxiliary	11	0.189943401	0.184245099	0.141868726	0.27	0.28431	0.0054	1.8
2001	2001	2001	2000 < kW ≤ 3700	2000	3700	Propulsion	13.36	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
2001	2001	2001	3700 < kW ≤ 999999	3700	999999	Propulsion	13.36	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
2002	2002	2002	0 < kW ≤ 8	0	8	All	7.0135346	0.475226437	0.460969644	0.354946626	1.0191752	1.073191486	0.020383504	4.11
2002	2002	2002	8 < kW ≤ 19	8	19	All	5.9541288	0.233842837	0.226827552	0.174657215	0.5900488	0.621321386	0.011800976	2.16
2002	2002	2002	19 < kW ≤ 37	19	37	All	6.3430246	0.327714237	0.31788281	0.244769764	0.3754856	0.395386337	0.007509712	1.53
2002	2002	2002	37 < kW ≤ 600	37	600	Propulsion	10.07572974	0.242182876	0.23491739	0.18088639	0.274411656	0.288955474	0.005488233	1.61959494
2002	2002	2002	37 < kW ≤ 600	37	600	Auxiliary	10.08055009	0.291669047	0.282918976	0.217847611	0.287121677	0.302339125	0.005742434	1.569098173
2002	2002	2002	600 < kW ≤ 1000	600	1000	Propulsion	10.24709501	0.207585212	0.201357656	0.155045395	0.266425092	0.280545622	0.005328502	1.654886508
2002	2002	2002	600 < kW ≤ 1000	600	1000	Auxiliary	10.40635063	0.211946637	0.205588238	0.158302943	0.27	0.28431	0.0054	1.621905189
2002	2002	2002	1000 < kW ≤ 1400	1000	1400	Propulsion	10.45348733	0.217246941	0.210729533	0.162261741	0.257304406	0.27094154	0.005146088	1.710114255
2002	2002	2002	1000 < kW ≤ 1400	1000	1400	Auxiliary	10.94720285	0.190999344	0.185269363	0.14265741	0.27	0.28431	0.0054	1.784160855
2002	2002	2002	1400 < kW ≤ 2000	1400	2000	Propulsion	11.79937468	0.196717762	0.190816229	0.146928497	0.22393434	0.23580286	0.004478687	2.030328298
2002	2002	2002	1400 < kW ≤ 2000	1400	2000	Auxiliary	11	0.189943401	0.184245099	0.141868726	0.27	0.28431	0.0054	1.8
2002	2002	2002	2000 < kW ≤ 3700	2000	3700	Propulsion	13.36	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
2002	2002	2002	3700 < kW ≤ 999999	3700	999999	Propulsion	13.36	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
2003	2003	2003	0 < kW ≤ 8	0	8	All	7.0135346	0.475226437	0.460969644	0.354946626	1.0191752	1.073191486	0.020383504	4.11
2003	2003	2003	8 < kW ≤ 19	8	19	All	5.9541288	0.233842837	0.226827552	0.174657215	0.5900488	0.621321386	0.011800976	2.16
2003	2003	2003	19 < kW ≤ 37	19	37	All	6.3430246	0.327714237	0.31788281	0.244769764	0.3754856	0.395386337	0.007509712	1.53
2003	2003	2003	37 < kW ≤ 600	37	600	Propulsion	10.07572974	0.242182876	0.23491739	0.18088639	0.274411656	0.288955474	0.005488233	1.61959494
2003	2003	2003	37 < kW ≤ 600	37	600	Auxiliary	10.08055009	0.291669047	0.282918976	0.217847611	0.287121677	0.302339125	0.005742434	1.569098173
2003	2003	2003	600 < kW ≤ 1000	600	1000	Propulsion	10.24709501	0.207585212	0.201357656	0.155045395	0.266425092	0.280545622	0.005328502	1.654886508
2003	2003	2003	600 < kW ≤ 1000	600	1000	Auxiliary	10.40635063	0.211946637	0.205588238	0.158302943	0.27	0.28431	0.0054	1.621905189
2003	2003	2003	1000 < kW ≤ 1400	1000	1400	Propulsion	10.45348733	0.217246941	0.210729533	0.162261741	0.257304406	0.27094154	0.005146088	1.710114255
2003	2003	2003	1000 < kW ≤ 1400	1000	1400	Auxiliary	10.94720285	0.190999344	0.185269363	0.14265741	0.27	0.28431	0.0054	1.784160855
2003	2003	2003	1400 < kW ≤ 2000	1400	2000	Propulsion	11.79937468	0.196717762	0.190816229	0.146928497	0.22393434	0.23580286	0.004478687	2.030328298
2003	2003	2003	1400 < kW ≤ 2000	1400	2000	Auxiliary	11	0.189943401	0.184245099	0.141868726	0.27	0.28431	0.0054	1.8
2003	2003	2003	2000 < kW ≤ 3700	2000	3700	Propulsion	13.36	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
2003	2003	2003	3700 < kW ≤ 999999	3700	999999	Propulsion	13.36	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
2004	2004	2004	0 < kW ≤ 8	0	8	All	7.0135346	0.475226437	0.460969644	0.354946626	1.0191752	1.073191486	0.020383504	4.11
2004	2004	2004	8 < kW ≤ 19	8	19	All	5.9541288	0.233842837	0.226827552	0.174657215	0.5900488	0.621321386	0.011800976	2.16
2004	2004	2004	19 < kW ≤ 37	19	37	All	4.9751842	0.295357611	0.286496883	0.2206026	0.7241508	0.762530792	0.014483016	1.53
2004	2004	2004	37 < kW ≤ 600	37	600	Propulsion	6.502347948	0.131122321	0.127188652	0.097935262	0.215258229	0.226666916	0.004305165	1.169448359
2004	2004	2004	37 < kW ≤ 600	37	600	Auxiliary	6.373213802	0.190053452	0.184351848	0.141950923	0.243423433	0.256324875	0.004868469	0.988800476
2004	2004	2004	600 < kW ≤ 1000	600	1000	Propulsion	7.827495235	0.160016676	0.155216176	0.119516456	0.232192912	0.244499137	0.004643858	1.440935384
2004	2004	2004	600 < kW ≤ 1000	600	1000	Auxiliary	7.621097743	0.165769504	0.160796419	0.123813243	0.239609254	0.252308544	0.004792185	1.317997725
2004	2004	2004	1000 < kW ≤ 1400	1000	1400	Propulsion	7.278008591	0.146554449	0.142157816	0.109461518	0.206431323	0.217372183	0.004128626	1.392157483
2004	2004	2004	1000 < kW ≤ 1400	1000	1400	Auxiliary	9.194720285	0.190999344	0.185269363	0.14265741	0.27	0.28431	0.0054	1.784160855
2004	2004	2004	1400 < kW ≤ 2000	1400	2000	Propulsion	9.657269415	0.196717762	0.190816229	0.146928497	0.22393434	0.23580286	0.004478687	2.030328298
2004	2004	2004	1400 < kW ≤ 2000	1400	2000	Auxiliary	9.2	0.189943401	0.184245099	0.141868726	0.27	0.28431	0.0054	1.8
2004	2004	2004	2000 < kW ≤ 3700	2000	3700	Propulsion	10.55	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
2004	2004	2004	3700 < kW ≤ 999999	3700	999999	Propulsion	10.55	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
2005	2005	2005	0 < kW ≤ 8	0	8	All	5.8870778	0.496510611	0.481615293	0.370843775	0.9118936	0.960223961	0.018237872	4.11
2005	2005	2005	8 < kW ≤ 19	8	19	All	4.8679026	0.241716811	0.234465307	0.180538286	0.2816142	0.296539753	0.005632284	2.16
2005	2005	2005	19 < kW ≤ 37	19	37	All	4.9751842	0.295357611	0.286496883	0.2206026	0.7241508	0.762530792	0.014483016	1.53
2005	2005	2005	37 < kW ≤ 600	37	600	Propulsion	6.456221024	0.128746596	0.124884198	0.096160832	0.215258229	0.226666916	0.004305165	1.169448359
2005	2005	2005	37 < kW ≤ 600	37	600	Auxiliary	6.104964927	0.156609567	0.15191128	0.116971686	0.243423433	0.256324875	0.004868469	0.962629855
2005	2005	2005	600 < kW ≤ 1000	600	1000	Propulsion	7.827495235	0.160016676	0.155216176	0.119516456	0.232192912	0.244499137	0.004643858	1.440935384
2005	2005	2005	600 < kW ≤ 1000	600	1000	Auxiliary	7.621097743	0.165769504	0.160796419	0.123813243	0.239609254	0.252308544	0.004792185	1.317997725
2005	2005	2005	1000 < kW ≤ 1400	1000	1400	Propulsion	7.278008591	0.146554449	0.142157816	0.109461518	0.206431323	0.217372183	0.004128626	1.392157483
2005	2005	2005	1000 < kW ≤ 1400	1000	1400	Auxiliary	9.194720285	0.190999344	0.185269363	0.14265741	0.27	0.28431	0.0054	1.784160855
2005	2005	2005	1400 < kW ≤ 2000	1400	2000	Propulsion	9.657269415	0.196717762	0.190816229	0.146928497	0.22393434	0.23580286	0.004478687	2.030328298
2005	2005	2005	1400 < kW ≤ 2000	1400	2000	Auxiliary	9.2	0.189943401	0.184245099	0.141868726	0.27	0.28431	0.0054	1.8
2005	2005	2005	2000 < kW ≤ 3700	2000	3700	Propulsion	10.55	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
2005	2005	2005	3700 < kW ≤ 999999	3700	999999	Propulsion	10.55	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
2006	2006	2006	0 < kW ≤ 8	0	8	All	5.8870778	0.496510611	0.481615293	0.370843775	0.9118936	0.960223961	0.018237872	4.11
2006	2006	2006	8 < kW ≤ 19	8	19	All	4.8679026	0.241716811	0.234465307	0.180538286	0.2816142	0.296539753	0.005632284	2.16
2006	2006	2006	19 < kW ≤ 37	19	37	All	4.9751842	0.295357611	0.286496883	0.2206026	0.7241508	0.762530792	0.014483016	1.53
2006	2006	2006	37 < kW ≤ 600	37	600	Propulsion	6.456221024	0.128746596	0.124884198	0.096160832	0.215258229	0.226666916	0.004305165	1.169448359
2006	2006	2006	37 < kW ≤ 600	37	600	Auxiliary	6.104964927	0.156609567	0.15191128	0.116971686	0.243423433	0.256324875	0.004868469	0.962629855
2006	2006	2006	600 < kW ≤ 1000	600	1000	Propulsion	7.827495235	0.160016676	0.155216176	0.119516456	0.232192912	0.244499137	0.004643858	1.440935384
2006	2006	2006	600 < kW ≤ 1000	600	1000	Auxiliary	7.621097743	0.165769504	0.160796419	0.123813243	0.239609254	0.252308544	0.004792185	1.317997725
2006	2006	2006	1000 < kW ≤ 1400	1000	1400	Propulsion	7.278008591	0.146554449	0.142157816	0.109461518	0.206431323	0.217372183	0.004128626	1.392157483
2006	2006	2006	1000 < kW ≤ 1400	1000	1400	Auxiliary	9.194720285	0.190999344	0.185269363	0.14265741	0.27	0.28431	0.0054	1.784160855
2006	2006	2006	1400 < kW ≤ 2000	1400	2000	Propulsion	9.657269415	0.196717762	0.190816229	0.146928497	0.22393434	0.23580286	0.004478687	2.030328298
2006	2006	2006	1400 < kW ≤ 2000	1400	2000	Auxiliary	9.2	0.189943401	0.184245099	0.141868726	0.27	0.28431	0.0054	1.8
2006	2006	2006	2000 < kW ≤ 3700	2000	3700	Propulsion	10.55	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
2006	2006	2006	3700 < kW ≤ 999999	3700	999999	Propulsion	10.55	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
2007	2007	2007	0 < kW ≤ 8	0	8	All	5.8870778	0.496510611	0.481615293	0.370843775	0.9118936	0.960223961	0.018237872	4.11
2007	2007	2007	8 < kW ≤ 19	8	19	All	4.8679026	0.241716811	0.234465307	0.180538286	0.2816142	0.296539753	0.005632284	2.16
2007	2007	2007	19 < kW ≤ 37	19	37	All	4.9751842	0.295357611	0.286496883	0.2206026	0.7241508	0.762530792	0.014483016	1.53
2007	2007	2007	37 < kW ≤ 600	37	600	Propulsion	6.057953233	0.122816494	0.119131999	0.091731639	0.206215721	0.217145154	0.004124314	1.101893496
2007	2007	2007	37 < kW ≤ 600	37	600	Auxiliary	5.962361954	0.153565047	0.148958096	0.114697734	0.240601621	0.253353506	0.004812032	0.929874671
2007	2007	2007	600 < kW ≤ 1000	600	1000	Propulsion	6.061246584	0.123770929	0.120057801	0.092444507	0.188527979	0.198519962	0.00377056	1.123657479
2007	2007	2007	600 < kW ≤ 1000	600	1000	Auxiliary	6.1	0.138776572	0.134613275	0.103652222	0.21	0.22113	0.0042	0.9
2007	2007	2007	1000 < kW ≤ 1400	1000	1400	Propulsion	6.217505389	0.136513063	0.132417671	0.101961607	0.184772403	0.19456534	0.003695448	1.184014957
2007	2007	2007	1000 < kW ≤ 1400	1000	1400	Auxiliary	6.1	0.138776572	0.134613275	0.103652222	0.21	0.22113	0.0042	0.9
2007	2007	2007	1400 < kW ≤ 2000	1400	2000	Propulsion	6.789213139	0.183133008	0.177639018	0.136782044	0.171031787	0.180096472	0.003420636	1.404846277
2007	2007	2007	1400 < kW ≤ 2000	1400	2000	Auxiliary	6.1	0.138776572	0.134613275	0.103652222	0.21	0.22113	0.0042	0.9
2007	2007	2007	2000 < kW ≤ 3700	2000	3700	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
2007	2007	2007	3700 < kW ≤ 999999	3700	999999	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
2008	2008	2008	0 < kW ≤ 8	0	8	All	5.8870778	0.496510611	0.481615293	0.370843775	0.9118936	0.960223961	0.018237872	4.11
2008	2008	2008	8 < kW ≤ 19	8	19	All	4.8679026	0.241716811	0.234465307	0.180538286	0.2816142	0.296539753	0.005632284	2.16
2008	2008	2008	19 < kW ≤ 37	19	37	All	4.9751842	0.295357611	0.286496883	0.2206026	0.7241508	0.762530792	0.014483016	1.53
2008	2008	2008	37 < kW ≤ 600	37	600	Propulsion	6.057953233	0.122816494	0.119131999	0.091731639	0.206215721	0.217145154	0.004124314	1.101893496
2008	2008	2008	37 < kW ≤ 600	37	600	Auxiliary	5.962361954	0.153565047	0.148958096	0.114697734	0.240601621	0.253353506	0.004812032	0.929874671
2008	2008	2008	600 < kW ≤ 1000	600	1000	Propulsion	6.061246584	0.123770929	0.120057801	0.092444507	0.188527979	0.198519962	0.00377056	1.123657479
2008	2008	2008	600 < kW ≤ 1000	600	1000	Auxiliary	6.1	0.138776572	0.134613275	0.103652222	0.21	0.22113	0.0042	0.9
2008	2008	2008	1000 < kW ≤ 1400	1000	1400	Propulsion	6.217505389	0.136513063	0.132417671	0.101961607	0.184772403	0.19456534	0.003695448	1.184014957
2008	2008	2008	1000 < kW ≤ 1400	1000	1400	Auxiliary	6.1	0.138776572	0.134613275	0.103652222	0.21	0.22113	0.0042	0.9
2008	2008	2008	1400 < kW ≤ 2000	1400	2000	Propulsion	6.789213139	0.183133008	0.177639018	0.136782044	0.171031787	0.180096472	0.003420636	1.404846277
2008	2008	2008	1400 < kW ≤ 2000	1400	2000	Auxiliary	6.1	0.138776572	0.134613275	0.103652222	0.21	0.22113	0.0042	0.9
2008	2008	2008	2000 < kW ≤ 3700	2000	3700	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
2008	2008	2008	3700 < kW ≤ 999999	3700	999999	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
2009	2009	2009	0 < kW ≤ 8	0	8	All	4.39	0.24	0.2328	0.179256	0.43	0.45279	0.0086	4.11
2009	2009	2009	8 < kW ≤ 19	8	19	All	3.63	0.19	0.1843	0.141911	0.21	0.22113	0.0042	2.16
2009	2009	2009	19 < kW ≤ 37	19	37	All	3.71	0.18	0.1746	0.134442	0.41	0.43173	0.0082	1.53
2009	2009	2009	37 < kW ≤ 600	37	600	Propulsion	6.057953233	0.122653676	0.118974066	0.09161003	0.205848537	0.21675851	0.004116971	1.101893496

2009	2009	2009	37 < kW ≤ 600	37	600	Auxiliary	5.962361954	0.150993805	0.146463991	0.112777273	0.234803004	0.247247564	0.00469606	0.929874671
2009	2009	2009	600 < kW ≤ 1000	600	1000	Propulsion	6.061246584	0.123770929	0.120057801	0.092444507	0.188527979	0.198519962	0.00377056	1.123657479
2009	2009	2009	600 < kW ≤ 1000	600	1000	Auxiliary	6.1	0.138776572	0.134613275	0.103652222	0.21	0.22113	0.0042	0.9
2009	2009	2009	1000 < kW ≤ 1400	1000	1400	Propulsion	6.217505389	0.136513063	0.132417671	0.101961607	0.184772403	0.19456534	0.003695448	1.184014957
2009	2009	2009	1000 < kW ≤ 1400	1000	1400	Auxiliary	6.1	0.138776572	0.134613275	0.103652222	0.21	0.22113	0.0042	0.9
2009	2009	2009	1400 < kW ≤ 2000	1400	2000	Propulsion	6.789213139	0.183133008	0.177639018	0.136782044	0.171031787	0.180096472	0.003420636	1.404846277
2009	2009	2009	1400 < kW ≤ 2000	1400	2000	Auxiliary	6.1	0.138776572	0.134613275	0.103652222	0.21	0.22113	0.0042	0.9
2009	2009	2009	2000 < kW ≤ 3700	2000	3700	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
2009	2009	2009	3700 < kW ≤ 999999	3700	999999	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
2010	2010	2010	0 < kW ≤ 8	0	8	All	4.39	0.24	0.2328	0.179256	0.43	0.45279	0.0086	4.11
2010	2010	2010	8 < kW ≤ 19	8	19	All	3.63	0.19	0.1843	0.141911	0.21	0.22113	0.0042	2.16
2010	2010	2010	19 < kW ≤ 37	19	37	All	3.71	0.18	0.1746	0.134442	0.41	0.43173	0.0082	1.53
2010	2010	2010	37 < kW ≤ 600	37	600	Propulsion	6.057953233	0.122653676	0.118974066	0.09161003	0.205848537	0.21675851	0.004116971	1.101893496
2010	2010	2010	37 < kW ≤ 600	37	600	Auxiliary	5.962361954	0.150993805	0.146463991	0.112777273	0.234803004	0.247247564	0.00469606	0.929874671
2010	2010	2010	600 < kW ≤ 1000	600	1000	Propulsion	6.061246584	0.123770929	0.120057801	0.092444507	0.188527979	0.198519962	0.00377056	1.123657479
2010	2010	2010	600 < kW ≤ 1000	600	1000	Auxiliary	6.1	0.138776572	0.134613275	0.103652222	0.21	0.22113	0.0042	0.9
2010	2010	2010	1000 < kW ≤ 1400	1000	1400	Propulsion	6.217505389	0.136513063	0.132417671	0.101961607	0.184772403	0.19456534	0.003695448	1.184014957
2010	2010	2010	1000 < kW ≤ 1400	1000	1400	Auxiliary	6.1	0.138776572	0.134613275	0.103652222	0.21	0.22113	0.0042	0.9
2010	2010	2010	1400 < kW ≤ 2000	1400	2000	Propulsion	6.789213139	0.183133008	0.177639018	0.136782044	0.171031787	0.180096472	0.003420636	1.404846277
2010	2010	2010	1400 < kW ≤ 2000	1400	2000	Auxiliary	6.1	0.138776572	0.134613275	0.103652222	0.21	0.22113	0.0042	0.9
2010	2010	2010	2000 < kW ≤ 3700	2000	3700	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
2010	2010	2010	3700 < kW ≤ 999999	3700	999999	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
2011	2011	2011	0 < kW ≤ 8	0	8	All	4.39	0.24	0.2328	0.179256	0.43	0.45279	0.0086	4.11
2011	2011	2011	8 < kW ≤ 19	8	19	All	3.63	0.19	0.1843	0.141911	0.21	0.22113	0.0042	2.16
2011	2011	2011	19 < kW ≤ 37	19	37	All	3.71	0.18	0.1746	0.134442	0.41	0.43173	0.0082	1.53
2011	2011	2011	37 < kW ≤ 600	37	600	Propulsion	6.057953233	0.122653676	0.118974066	0.09161003	0.205848537	0.21675851	0.004116971	1.101893496
2011	2011	2011	37 < kW ≤ 600	37	600	Auxiliary	5.962361954	0.150993805	0.146463991	0.112777273	0.234803004	0.247247564	0.00469606	0.929874671
2011	2011	2011	600 < kW ≤ 1000	600	1000	Propulsion	6.061246584	0.123770929	0.120057801	0.092444507	0.188527979	0.198519962	0.00377056	1.123657479
2011	2011	2011	600 < kW ≤ 1000	600	1000	Auxiliary	6.1	0.138776572	0.134613275	0.103652222	0.21	0.22113	0.0042	0.9
2011	2011	2011	1000 < kW ≤ 1400	1000	1400	Propulsion	6.217505389	0.136513063	0.132417671	0.101961607	0.184772403	0.19456534	0.003695448	1.184014957
2011	2011	2011	1000 < kW ≤ 1400	1000	1400	Auxiliary	6.1	0.138776572	0.134613275	0.103652222	0.21	0.22113	0.0042	0.9
2011	2011	2011	1400 < kW ≤ 2000	1400	2000	Propulsion	6.789213139	0.183133008	0.177639018	0.136782044	0.171031787	0.180096472	0.003420636	1.404846277
2011	2011	2011	1400 < kW ≤ 2000	1400	2000	Auxiliary	6.1	0.138776572	0.134613275	0.103652222	0.21	0.22113	0.0042	0.9
2011	2011	2011	2000 < kW ≤ 3700	2000	3700	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
2011	2011	2011	3700 < kW ≤ 999999	3700	999999	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
2012	2012	2012	0 < kW ≤ 8	0	8	All	4.39	0.24	0.2328	0.179256	0.43	0.45279	0.0086	4.11
2012	2012	2012	8 < kW ≤ 19	8	19	All	3.63	0.19	0.1843	0.141911	0.21	0.22113	0.0042	2.16
2012	2012	2012	19 < kW ≤ 37	19	37	All	3.71	0.18	0.1746	0.134442	0.41	0.43173	0.0082	1.53
2012	2012	2012	37 < kW ≤ 600	37	600	Propulsion	6.040540037	0.12136727	0.117726252	0.090649214	0.203364655	0.214142981	0.004067293	1.101893496
2012	2012	2012	37 < kW ≤ 600	37	600	Auxiliary	5.923469261	0.148340787	0.143890563	0.110795734	0.229858448	0.242040946	0.004597169	0.929874671
2012	2012	2012	600 < kW ≤ 1000	600	1000	Propulsion	5.872305814	0.116026489	0.112545694	0.086660185	0.174238341	0.183472973	0.003484767	1.123657479
2012	2012	2012	600 < kW ≤ 1000	600	1000	Auxiliary	5.608315737	0.114892675	0.111445895	0.085813339	0.169364937	0.178341279	0.003387299	0.9
2012	2012	2012	1000 < kW ≤ 1400	1000	1400	Propulsion	6.051105922	0.129692563	0.125801786	0.096867375	0.172187569	0.18131351	0.003443751	1.184014957
2012	2012	2012	1000 < kW ≤ 1400	1000	1400	Auxiliary	4.953884551	0.083103235	0.080610138	0.062069807	0.115279715	0.12138954	0.002305594	0.9
2012	2012	2012	1400 < kW ≤ 2000	1400	2000	Propulsion	6.00228766	0.150877943	0.146351605	0.112690736	0.111516415	0.117426785	0.002230328	1.404846277
2012	2012	2012	1400 < kW ≤ 2000	1400	2000	Auxiliary	4.89	0.08	0.0776	0.059752	0.11	0.11583	0.0022	0.9
2012	2012	2012	2000 < kW ≤ 3700	2000	3700	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
2012	2012	2012	3700 < kW ≤ 999999	3700	999999	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
2013	2013	2013	0 < kW ≤ 8	0	8	All	4.39	0.24	0.2328	0.179256	0.43	0.45279	0.0086	4.11
2013	2013	2013	8 < kW ≤ 19	8	19	All	3.63	0.19	0.1843	0.141911	0.21	0.22113	0.0042	2.16
2013	2013	2013	19 < kW ≤ 37	19	37	All	3.71	0.18	0.1746	0.134442	0.41	0.43173	0.0082	1.53
2013	2013	2013	37 < kW ≤ 600	37	600	Propulsion	5.667787332	0.105036552	0.101885455	0.0784518	0.170337356	0.179365236	0.003406747	1.101893496
2013	2013	2013	37 < kW ≤ 600	37	600	Auxiliary	5.66128332	0.127551538	0.123724992	0.095268244	0.196412337	0.206822191	0.003928247	0.929874671
2013	2013	2013	600 < kW ≤ 1000	600	1000	Propulsion	5.303250987	0.091923048	0.089165357	0.068657325	0.13772262	0.145021919	0.002754452	1.123657479
2013	2013	2013	600 < kW ≤ 1000	600	1000	Auxiliary	5.492423621	0.109771065	0.106477933	0.081988008	0.160651244	0.16916576	0.003213025	0.9
2013	2013	2013	1000 < kW ≤ 1400	1000	1400	Propulsion	5.659314461	0.104751681	0.101609131	0.07823903	0.15443172	0.162616602	0.003088634	1.184014957
2013	2013	2013	1000 < kW ≤ 1400	1000	1400	Auxiliary	4.883664342	0.08	0.0776	0.059752	0.11	0.11583	0.0022	0.9
2013	2013	2013	1400 < kW ≤ 2000	1400	2000	Propulsion	5.397782	0.099962027	0.096963166	0.074661638	0.095123041	0.100164562	0.001902461	1.404846277
2013	2013	2013	1400 < kW ≤ 2000	1400	2000	Auxiliary	4.89	0.08	0.0776	0.059752	0.11	0.11583	0.0022	0.9
2013	2013	2013	2000 < kW ≤ 3700	2000	3700	Propulsion	8.33	0.185168125	0.179613081	0.138302073	0.134	0.141102	0.00268	2
2013	2013	2013	3700 < kW ≤ 999999	3700	999999	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
2014	2014	2014	0 < kW ≤ 8	0	8	All	4.39	0.24	0.2328	0.179256	0.43	0.45279	0.0086	4.11
2014	2014	2014	8 < kW ≤ 19	8	19	All	2.32	0.19	0.1843	0.141911	0.21	0.22113	0.0042	2.16
2014	2014	2014	19 < kW ≤ 37	19	37	All	2.32	0.18	0.1746	0.134442	0.41	0.43173	0.0082	1.53
2014	2014	2014	37 < kW ≤ 600	37	600	Propulsion	4.69200658	0.068970284	0.066901176	0.051513905	0.103789751	0.109290608	0.002075795	1.101893496
2014	2014	2014	37 < kW ≤ 600	37	600	Auxiliary	4.579829478	0.084744322	0.082201993	0.063295534	0.123581931	0.130131773	0.002471639	0.929874671
2014	2014	2014	600 < kW ≤ 1000	600	1000	Propulsion	4.742699043	0.071051443	0.0689199	0.053068323	0.099211417	0.104469622	0.001984228	1.123657479
2014	2014	2014	600 < kW ≤ 1000	600	1000	Auxiliary	4.818762076	0.08	0.0776	0.059752	0.11	0.11583	0.0022	0.9
2014	2014	2014	1000 < kW ≤ 1400	1000	1400	Propulsion	4.826267717	0.073733998	0.071521978	0.055071923	0.097199501	0.102351075	0.00194399	1.184014957
2014	2014	2014	1000 < kW ≤ 1400	1000	1400	Auxiliary	4.883664342	0.08	0.0776	0.059752	0.11	0.11583	0.0022	0.9
2014	2014	2014	1400 < kW ≤ 2000	1400	2000	Propulsion	5.268970274	0.099237331	0.096260211	0.074120363	0.09148989	0.096338854	0.001829798	1.404846277
2014	2014	2014	1400 < kW ≤ 2000	1400	2000	Auxiliary	4.89	0.08	0.0776	0.059752	0.11	0.11583	0.0022	0.9
2014	2014	2014	2000 < kW ≤ 3700	2000	3700	Propulsion	1.3	0.181849231	0.176393754	0.13582319	0.016218462	0.01707804	0.000324369	2
2014	2014	2014	3700 < kW ≤ 999999	3700	999999	Propulsion	1.3	0.179579784	0.174192391	0.134128141	0.066121522	0.069625963	0.00132243	2
2015	2015	2015	0 < kW ≤ 8	0	8	All	4.39	0.24	0.2328	0.179256	0.43	0.45279	0.0086	4.11
2015	2015	2015	8 < kW ≤ 19	8	19	All	2.32	0.19	0.1843	0.141911	0.21	0.22113	0.0042	2.16
2015	2015	2015	19 < kW ≤ 37	19	37	All	2.32	0.18	0.1746	0.134442	0.41	0.43173	0.0082	1.53
2015	2015	2015	37 < kW ≤ 600	37	600	Propulsion	4.69200658	0.068970284	0.066901176	0.051513905	0.103789751	0.109290608	0.002075795	1.101893496
2015	2015	2015	37 < kW ≤ 600	37	600	Auxiliary	4.579829478	0.084744322	0.082201993	0.063295534	0.123581931	0.130131773	0.002471639	0.929874671
2015	2015	2015	600 < kW ≤ 1000	600	1000	Propulsion	4.742699043	0.071051443	0.0689199	0.053068323	0.099211417	0.104469622	0.001984228	1.123657479
2015	2015	2015	600 < kW ≤ 1000	600	1000	Auxiliary	4.818762076	0.08	0.0776	0.059752	0.11	0.11583	0.0022	0.9
2015	2015	2015	1000 < kW ≤ 1400	1000	1400	Propulsion	4.826267717	0.073733998	0.071521978	0.055071923	0.097199501	0.102351075	0.00194399	1.184014957
2015	2015	2015	1000 < kW ≤ 1400	1000	1400	Auxiliary	4.883664342	0.08	0.0776	0.059752	0.11	0.11583	0.0022	0.9
2015	2015	2015	1400 < kW ≤ 2000	1400	2000	Propulsion	5.268970274	0.099237331	0.096260211	0.074120363	0.09148989	0.096338854	0.001829798	1.404846277
2015	2015	2015	1400 < kW ≤ 2000	1400	2000	Auxiliary	4.89	0.08	0.0776	0.059752	0.11	0.11583	0.0022	0.9
2015	2015	2015	2000 < kW ≤ 3700	2000	3700	Propulsion	1.3	0.181849231	0.176393754	0.13582319	0.016218462	0.01707804	0.000324369	2
2015	2015	2015	3700 < kW ≤ 999999	3700	999999	Propulsion	1.3	0.179579784	0.174192391	0.134128141	0.066121522	0.069625963	0.00132243	2
2016	2016	2016	0 < kW ≤ 8	0	8	All	4.39	0.24	0.2328	0.179256	0.43	0.45279	0.0086	4.11
2016	2016	2016	8 < kW ≤ 19	8	19	All	2.32	0.19	0.1843	0.141911	0.21	0.22113	0.0042	2.16
2016	2016	2016	19 < kW ≤ 37	19	37	All	2.32	0.18	0.1746	0.134442	0.41	0.43173	0.0082	1.53
2016	2016	2016	37 < kW ≤ 600	37	600	Propulsion	4.69200658	0.068970284	0.066901176	0.051513905	0.103789751	0.109290608	0.002075795	1.101893496
2016	2016	2016	37 < kW ≤ 600	37	600	Auxiliary	4.579829478	0.084744322	0.082201993	0.063295534	0.123581931	0.130131773	0.002471639	0.929874671
2016	2016	2016	600 < kW ≤ 1000	600	1000	Propulsion	4.742699043	0.071051443	0.0689199	0.053068323	0.099211417	0.104469622	0.001984228	1.123657479
2016	2016	2016	600 < kW ≤ 1000	600	1000	Auxiliary	4.818762076	0.08	0.0776	0.059752	0.11	0.11583	0.0022	0.9
2016	2016	2016	1000 < kW ≤ 1400	1000	1400	Propulsion	4.826267717	0.073733998	0.071521978	0.055071923	0.097199501	0.102351075	0.00194399	1.184014957
2016	2016	2016	1000 < kW ≤ 1400	1000	1400	Auxiliary	4.883664342	0.08	0.0776	0.059752	0.11	0.11583	0.0022	0.9
2016	2016	2016	1400 < kW ≤ 2000	1400	2000	Propulsion	1.3	0.030825716	0.029900945	0.023023727	0.032399922	0.034117118	0.000647998	1.404846277
2016	2016	2016	1400 < kW ≤ 2000	1400	2000	Auxiliary	1.3	0.03	0.0291	0.022407	0.04	0.04212	0.0008	0.9
2016	2016	2016	2000 < kW ≤ 3700	2000	3700	Propulsion	1.3	0.033781538	0.032768092	0.025231431	0.016218462	0.01707804	0.000324369	2
2016	2016	2016	3700 < kW ≤ 999999	3700	999999	Propulsion	1.3	0.179579784	0.174192391	0.134128141	0.066121522	0.069625963	0.00132243	2
2017	2017	2017	0 < kW ≤ 8	0	8	All	4.39	0.24	0.2328	0.179256	0.43	0.45279	0.0086	4.11
2017	2017	2017	8 < kW ≤ 19	8	19	All	2.32	0.19	0.1843	0.141911	0.21	0.22113	0.0042	2.16
2017	2017	2017	19 < kW ≤ 37	19	37	All	2.32	0.18	0.1746	0.134442	0.41	0.43173	0.0082	1.53
2017	2017	2017	37 < kW ≤ 600	37	600	Propulsion	4.69200658	0.068970284	0.066901176	0.051513905	0.103789751	0.109290608	0.002075795	1.101893496
2017	2017	2017	37 < kW ≤ 600	37	600	Auxiliary	4.579829478	0.084744322	0.082201993	0.063295534	0.123581931	0.130131773	0.002471639	0.929874671
2017	2017	2017	600 < kW ≤ 1000	600	1000	Propulsion	4.742699043	0.071051443	0.0689199	0.053068323	0.099211417	0.104469622	0.001984228	1.123657479
2017	2017	2017	600 < kW ≤ 1000	600	1000	Auxiliary	4.818762076	0.08	0.0776	0.059752	0.11	0.11583	0.0022	0.9
2017	2017	2017	1000 < kW ≤ 1400	1000	1400	Propulsion	1.3	0.03	0.0291	0.022407	0.038133001	0.04015405	0.00076266	1.184014957
2017	2017	2017	1000 < kW ≤ 1400	1000	1400	Auxiliary	1.3	0.03	0.0291	0.022407	0.04	0.04212	0.0008	0.9
2017	2017	2017	1400 < kW ≤ 2000	1400	2000	Propulsion	1.3	0.030825716	0.029900945	0.023023727	0.032399922	0.034117118	0.000647998	1.404846277
2017	2017	2017	1400 < kW ≤ 2000	1400	2000	Auxiliary	1.3	0.03	0.0291	0.022407	0.04	0.04212	0.0008	0.9
2017	2017	2017	2000 < kW ≤ 3700	2000	3700	Propulsion	1.3	0.033781538	0.032768092	0.025231431	0.016218462	0.01707804	0.000324369	2
2017	2017	2017	3700 < kW ≤ 999999	3700	999999	Propulsion	1.3	0.046121522	0.044737876	0.034448165	0.017756956	0.018698075	0.000355139	2
2018+	2018	9999	0 < kW ≤ 8	0	8	All	4.39	0.24	0.2328	0.179256	0.43	0.45279	0.0086	4.11
2018+	2018	9999	8 < kW ≤ 19	8	19	All	2.32	0.19	0.1843	0.141911	0.21	0.22113	0.0042	2.16
2018+	2018	9999	19 < kW ≤ 37	19	37	All	2.32	0.18	0.1746	0.134442	0.41	0.43173	0.0082	1.53
2018+	2018	9999	37 < kW ≤ 600	37	600	Propulsion	4.69200658	0.061298242	0.059459294	0.045783657	0.103789751	0.109290608	0.002075795	1.101893496
2018+	2018	9999	37 < kW ≤ 600	37	600	Auxiliary	4.579829478	0.07699098	0.07468125	0.057504563	0.123581931	0.130131773	0.002471639	0.929874671
2018+	2018	9999	600 < kW ≤ 1000	600	1000	Propulsion	1.3	0.03	0.0291	0.022407	0.039474278	0.041566415	0.000789486	1.123657479
2018+	2018	9999	600 < kW ≤ 1000	600	1000	Auxiliary	1.3	0.03	0.0291	0.022407	0.04	0.04212	0.0008	0.9
2018+	2018	9999	1000 < kW ≤ 1400	1000	1400	Propulsion	1.3	0.03	0.0291	0.022407	0.038133001	0.04015405	0.00076266	1.184014957
2018+	2018	9999	1000 < kW ≤ 1400	1000	1400	Auxiliary	1.3	0.03	0.0291	0.022407	0.04	0.04212	0.0008	0.9
2018+	2018	9999	1400 < kW ≤ 2000	1400	2000	Propulsion	1.3	0.030825716	0.029900945	0.023023727	0.032399922	0.034117118	0.000647998	1.404846277
2018+	2018	9999	1400 < kW ≤ 2000	1400	2000	Auxiliary	1.3	0.03	0.0291	0.022407	0.04	0.04212	0.0008	0.9
2018+	2018	9999	2000 < kW ≤ 3700	2000	3700	Propulsion	1.3	0.033781538	0.032768092	0.025231431	0.016218462	0.01707804	0.000324369	2
2018+	2018	9999	3700 < kW ≤ 999999	3700	999999	Propulsion	1.3	0.046121522	0.044737876	0.034448165	0.017756956	0.018698075	0.000355139	2

Wharf Construction

Contra Costa County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	0.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2023
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 -

Construction Phase - Applicant provided schedule

Off-road Equipment - No offroad construction equipment

Off-road Equipment - Applicant provided information

Off-road Equipment -

Off-road Equipment - No offroad construction equipment

Off-road Equipment - No offroad construction equipment

Off-road Equipment - No offroad construction equipment

Trips and VMT - estimated workers for wharf construction. Total average for all construction is 24, accounted for in landside construction modeling.
Applicant provided vendor and haul trips to account for demo material

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	PhaseName	Architectural Coating	Punch List and Final Completion
tblConstructionPhase	NumDays	0.00	10.00
tblConstructionPhase	NumDays	0.00	70.00
tblConstructionPhase	NumDays	0.00	1.00
tblConstructionPhase	NumDays	0.00	3.00
tblConstructionPhase	NumDays	0.00	76.00
tblConstructionPhase	NumDays	0.00	62.00
tblConstructionPhase	PhaseEndDate	9/2/2021	4/12/2022
tblConstructionPhase	PhaseEndDate	9/2/2021	2/8/2022
tblConstructionPhase	PhaseEndDate	9/2/2021	9/1/2021
tblConstructionPhase	PhaseEndDate	9/2/2021	9/7/2021
tblConstructionPhase	PhaseEndDate	9/2/2021	3/15/2022
tblConstructionPhase	PhaseEndDate	9/2/2021	11/30/2021
tblConstructionPhase	PhaseStartDate	9/3/2021	3/30/2022
tblConstructionPhase	PhaseStartDate	9/3/2021	11/3/2021
tblConstructionPhase	PhaseStartDate	9/3/2021	9/1/2021
tblConstructionPhase	PhaseStartDate	9/3/2021	11/30/2021
tblConstructionPhase	PhaseStartDate	9/3/2021	9/6/2021
tblDemolition	PhaseName	Demolition	Mobilization
tblGrading	PhaseName	Grading	Deck Construction - Demo
tblGrading	PhaseName	Site Preparation	Pile Driving
tblOffRoadEquipment	HorsePower	158.00	1,050.00
tblOffRoadEquipment	HorsePower	158.00	300.00
tblOffRoadEquipment	LoadFactor	0.38	0.60
tblOffRoadEquipment	LoadFactor	0.38	0.60
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	PhaseName	Architectural Coating	Punch List and Final Completion
tblOffRoadEquipment	PhaseName	Paving	Fenders, Wharf Appurtenances, Utilities
tblOffRoadEquipment	PhaseName	Demolition	Mobilization
tblOffRoadEquipment	PhaseName	Grading	Deck Construction - Demo
tblOffRoadEquipment	PhaseName	Building Construction	Deck Construction - New Deck
tblOffRoadEquipment	PhaseName	Building Construction	Deck Construction - New Deck
tblOffRoadEquipment	PhaseName	Site Preparation	Pile Driving
tblOffRoadEquipment	PhaseName	Paving	Fenders, Wharf Appurtenances, Utilities
tblOffRoadEquipment	PhaseName	Paving	Fenders, Wharf Appurtenances, Utilities
tblOffRoadEquipment	PhaseName	Demolition	Mobilization
tblOffRoadEquipment	PhaseName	Grading	Deck Construction - Demo
tblOffRoadEquipment	PhaseName	Building Construction	Deck Construction - New Deck
tblOffRoadEquipment	PhaseName	Demolition	Mobilization
tblOffRoadEquipment	PhaseName	Grading	Deck Construction - Demo
tblOffRoadEquipment	PhaseName	Paving	Fenders, Wharf Appurtenances, Utilities
tblOffRoadEquipment	PhaseName	Site Preparation	Pile Driving
tblOffRoadEquipment	PhaseName		Pile Driving
tblOffRoadEquipment	PhaseName		Pile Driving
tblTripsAndVMT	PhaseName		Mobilization
tblTripsAndVMT	PhaseName		Pile Driving
tblTripsAndVMT	PhaseName		Deck Construction - Demo
tblTripsAndVMT	PhaseName		Deck Construction - New Deck
tblTripsAndVMT	PhaseName		Fenders, Wharf Appurtenances, Utilities

tblTripsAndVMT	PhaseName		Punch List and Final Completion
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	5.00	10.00
tblTripsAndVMT	WorkerTripNumber	0.00	10.00
tblTripsAndVMT	WorkerTripNumber	18.00	10.00
tblTripsAndVMT	WorkerTripNumber	0.00	10.00

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					
2021	0.0174	0.1503	0.1534	4.1000e-004	5.8100e-003	6.5600e-003	0.0124	1.5500e-003	6.1000e-003	7.6500e-003	0.0000	35.3074	35.3074	8.8600e-003	0.0000	35.5289
2022	0.0192	0.1629	0.2016	3.4000e-004	3.6200e-003	8.1300e-003	0.0118	9.6000e-004	7.6000e-003	8.5700e-003	0.0000	28.9045	28.9045	7.2700e-003	0.0000	29.0864
Maximum	**0.0192**	**0.1629**	**0.2016**	**4.1000e-004**	**5.8100e-003**	**8.1300e-003**	**0.0124**	**1.5500e-003**	**7.6000e-003**	**8.5700e-003**	**0.0000**	**35.3074**	**35.3074**	**8.8600e-003**	**0.0000**	**35.5289**

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					
2021	0.0174	0.1011	0.1534	4.1000e-004	5.8100e-003	6.5600e-003	0.0124	1.5500e-003	6.1000e-003	7.6500e-003	0.0000	35.3073	35.3073	8.8600e-003	0.0000	35.5289

2022	0.0192	0.1629	0.2016	3.4000e-004	3.6200e-003	8.1300e-003	0.0118	9.6000e-004	7.6000e-003	8.5700e-003	0.0000	28.9045	28.9045	7.2700e-003	0.0000	29.0864
Maximum	**0.0192**	**0.1629**	**0.2016**	**4.1000e-004**	**5.8100e-003**	**8.1300e-003**	**0.0124**	**1.5500e-003**	**7.6000e-003**	**8.5700e-003**	**0.0000**	**35.3073**	**35.3073**	**8.8600e-003**	**0.0000**	**35.5289**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**15.69**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	**Start Date**	**End Date**	**Maximum Unmitigated ROG + NOX (tons/quarter)**	**Maximum Mitigated ROG + NOX (tons/quarter)**
1	**9-3-2021**	**12-2-2021**	0.0879	0.0392
2	**12-3-2021**	**3-2-2022**	0.2238	0.2238
3	**3-3-2022**	**6-2-2022**	0.0398	0.0398
		Highest	0.2238	0.2238

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

Mitigated Operational

Category	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
	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Demolition	9/1/2021	9/1/2021	5	1	
2	Pile Driving	Site Preparation	9/6/2021	11/30/2021	5	62	
3	Deck Construction - Demo	Grading	9/3/2021	9/7/2021	5	3	
4	Deck Construction - New Deck	Building Construction	11/3/2021	2/8/2022	5	70	
5	Fenders, Wharf Appurtenances, Utilities	Paving	11/30/2021	3/15/2022	5	76	
6	Punch List and Final Completion	Architectural Coating	3/30/2022	4/12/2022	5	10	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Punch List and Final Completion	Air Compressors	1	6.00	78	0.48
Fenders, Wharf Appurtenances, Utilities	Cement and Mortar Mixers	4	6.00	9	0.56
Mobilization	Concrete/Industrial Saws	0	8.00	81	0.73
Deck Construction - Demo	Concrete/Industrial Saws	1	8.00	81	0.73
Deck Construction - New Deck	Cranes	0	4.00	231	0.29
Deck Construction - New Deck	Forklifts	0	6.00	89	0.20
Pile Driving	Graders	0	8.00	187	0.41
Fenders, Wharf Appurtenances, Utilities	Pavers	1	7.00	130	0.42
Fenders, Wharf Appurtenances, Utilities	Rollers	1	7.00	80	0.38
Mobilization	Rubber Tired Dozers	0	1.00	247	0.40
Deck Construction - Demo	Rubber Tired Dozers	1	1.00	247	0.40
Deck Construction - New Deck	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Mobilization	Tractors/Loaders/Backhoes	0	6.00	97	0.37
Deck Construction - Demo	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Fenders, Wharf Appurtenances, Utilities	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Pile Driving	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Pile Driving	Excavators	1	5.00	1050	0.60
Pile Driving	Excavators	1	3.00	300	0.60

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
Mobilization	4	10.00	1.00	2.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pile Driving	2	10.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Deck Construction - Demo	4	10.00	0.00	56.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

Deck Construction - New Deck	5	10.00	0.00	3.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Fenders, Wharf Appurtenances	7	10.00	0.00	3.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Punch List and Final Completion	1	10.00	1.00	2.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Mobilization - 2021

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	0.0000	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**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	2.7000e-004	5.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0749	0.0749	0.0000	0.0000	0.0750
Vendor	0.0000	5.0000e-005	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0129	0.0129	0.0000	0.0000	0.0129
Worker	2.0000e-005	1.0000e-005	1.1000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0336	0.0336	0.0000	0.0000	0.0336
Total	**3.0000e-005**	**3.3000e-004**	**1.7000e-004**	**0.0000**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**1.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.1214**	**0.1214**	**0.0000**	**0.0000**	**0.1215**

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	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	2.7000e-004	5.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0749	0.0749	0.0000	0.0000	0.0750
Vendor	0.0000	5.0000e-005	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0129	0.0129	0.0000	0.0000	0.0129
Worker	2.0000e-005	1.0000e-005	1.1000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0336	0.0336	0.0000	0.0000	0.0336
Total	**3.0000e-005**	**3.3000e-004**	**1.7000e-004**	**0.0000**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**1.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.1214**	**0.1214**	**0.0000**	**0.0000**	**0.1215**

3.3 Pile Driving - 2021

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.2800e-003	0.0492	0.0401	1.8000e-004		1.6400e-003	1.6400e-003		1.5100e-003	1.5100e-003	0.0000	15.7227	15.7227	5.0900e-003	0.0000	15.8499
Total	**5.2800e-003**	**0.0492**	**0.0401**	**1.8000e-004**	**0.0000**	**1.6400e-003**	**1.6400e-003**	**0.0000**	**1.5100e-003**	**1.5100e-003**	**0.0000**	**15.7227**	**15.7227**	**5.0900e-003**	**0.0000**	**15.8499**

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	9.6000e-004	6.7000e-004	7.1000e-003	2.0000e-005	2.4600e-003	2.0000e-005	2.4700e-003	6.5000e-004	1.0000e-005	6.7000e-004	0.0000	2.0805	2.0805	5.0000e-005	0.0000	2.0817
Total	**9.6000e-004**	**6.7000e-004**	**7.1000e-003**	**2.0000e-005**	**2.4600e-003**	**2.0000e-005**	**2.4700e-003**	**6.5000e-004**	**1.0000e-005**	**6.7000e-004**	**0.0000**	**2.0805**	**2.0805**	**5.0000e-005**	**0.0000**	**2.0817**

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Off-Road	5.2800e-003	0.0000	0.0401	1.8000e-004		1.6400e-003	1.6400e-003		1.5100e-003	1.5100e-003	0.0000	15.7227	15.7227	5.0900e-003	0.0000	15.8498
Total	**5.2800e-003**	**0.0000**	**0.0401**	**1.8000e-004**	**0.0000**	**1.6400e-003**	**1.6400e-003**	**0.0000**	**1.5100e-003**	**1.5100e-003**	**0.0000**	**15.7227**	**15.7227**	**5.0900e-003**	**0.0000**	**15.8498**

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	9.6000e-004	6.7000e-004	7.1000e-003	2.0000e-005	2.4600e-003	2.0000e-005	2.4700e-003	6.5000e-004	1.0000e-005	6.7000e-004	0.0000	2.0805	2.0805	5.0000e-005	0.0000	2.0817
Total	**9.6000e-004**	**6.7000e-004**	**7.1000e-003**	**2.0000e-005**	**2.4600e-003**	**2.0000e-005**	**2.4700e-003**	**6.5000e-004**	**1.0000e-005**	**6.7000e-004**	**0.0000**	**2.0805**	**2.0805**	**5.0000e-005**	**0.0000**	**2.0817**

3.4 Deck Construction - Demo - 2021

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.1900e-003	0.0109	0.0114	2.0000e-005		6.1000e-004	6.1000e-004		5.8000e-004	5.8000e-004	0.0000	1.5614	1.5614	2.9000e-004	0.0000	1.5687
Total	**1.1900e-003**	**0.0109**	**0.0114**	**2.0000e-005**	**0.0000**	**6.1000e-004**	**6.1000e-004**	**0.0000**	**5.8000e-004**	**5.8000e-004**	**0.0000**	**1.5614**	**1.5614**	**2.9000e-004**	**0.0000**	**1.5687**

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	2.2000e-004	7.5000e-003	1.4900e-003	2.0000e-005	4.7000e-004	2.0000e-005	5.0000e-004	1.3000e-004	2.0000e-005	1.5000e-004	0.0000	2.0970	2.0970	9.0000e-005	0.0000	2.0993
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-005	3.0000e-005	3.4000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1007	0.1007	0.0000	0.0000	0.1007
Total	**2.7000e-004**	**7.5300e-003**	**1.8300e-003**	**2.0000e-005**	**5.9000e-004**	**2.0000e-005**	**6.2000e-004**	**1.6000e-004**	**2.0000e-005**	**1.8000e-004**	**0.0000**	**2.1977**	**2.1977**	**9.0000e-005**	**0.0000**	**2.2000**

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.1900e-003	0.0109	0.0114	2.0000e-005		6.1000e-004	6.1000e-004		5.8000e-004	5.8000e-004	0.0000	1.5614	1.5614	2.9000e-004	0.0000	1.5687
Total	**1.1900e-003**	**0.0109**	**0.0114**	**2.0000e-005**	**0.0000**	**6.1000e-004**	**6.1000e-004**	**0.0000**	**5.8000e-004**	**5.8000e-004**	**0.0000**	**1.5614**	**1.5614**	**2.9000e-004**	**0.0000**	**1.5687**

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	2.2000e-004	7.5000e-003	1.4900e-003	2.0000e-005	4.7000e-004	2.0000e-005	5.0000e-004	1.3000e-004	2.0000e-005	1.5000e-004	0.0000	2.0970	2.0970	9.0000e-005	0.0000	2.0993
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-005	3.0000e-005	3.4000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1007	0.1007	0.0000	0.0000	0.1007
Total	**2.7000e-004**	**7.5300e-003**	**1.8300e-003**	**2.0000e-005**	**5.9000e-004**	**2.0000e-005**	**6.2000e-004**	**1.6000e-004**	**2.0000e-005**	**1.8000e-004**	**0.0000**	**2.1977**	**2.1977**	**9.0000e-005**	**0.0000**	**2.2000**

3.5 Deck Construction - New Deck - 2021

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	0.0000	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**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	2.5000e-004	5.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0690	0.0690	0.0000	0.0000	0.0691
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	6.7000e-004	4.7000e-004	4.9200e-003	2.0000e-005	1.7100e-003	1.0000e-005	1.7200e-003	4.5000e-004	1.0000e-005	4.6000e-004	0.0000	1.4429	1.4429	3.0000e-005	0.0000	1.4437
Total	**6.8000e-004**	**7.2000e-004**	**4.9700e-003**	**2.0000e-005**	**1.7300e-003**	**1.0000e-005**	**1.7400e-003**	**4.6000e-004**	**1.0000e-005**	**4.7000e-004**	**0.0000**	**1.5119**	**1.5119**	**3.0000e-005**	**0.0000**	**1.5128**

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	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	2.5000e-004	5.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0690	0.0690	0.0000	0.0000	0.0691
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	6.7000e-004	4.7000e-004	4.9200e-003	2.0000e-005	1.7100e-003	1.0000e-005	1.7200e-003	4.5000e-004	1.0000e-005	4.6000e-004	0.0000	1.4429	1.4429	3.0000e-005	0.0000	1.4437
Total	**6.8000e-004**	**7.2000e-004**	**4.9700e-003**	**2.0000e-005**	**1.7300e-003**	**1.0000e-005**	**1.7400e-003**	**4.6000e-004**	**1.0000e-005**	**4.7000e-004**	**0.0000**	**1.5119**	**1.5119**	**3.0000e-005**	**0.0000**	**1.5128**

3.5 Deck Construction - New Deck - 2022

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	0.0000	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**

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	1.4000e-004	3.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0428	0.0428	0.0000	0.0000	0.0428
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	2.6000e-004	2.8400e-003	1.0000e-005	1.0700e-003	1.0000e-005	1.0800e-003	2.8000e-004	1.0000e-005	2.9000e-004	0.0000	0.8724	0.8724	2.0000e-005	0.0000	0.8728
Total	**3.9000e-004**	**4.0000e-004**	**2.8700e-003**	**1.0000e-005**	**1.0900e-003**	**1.0000e-005**	**1.1000e-003**	**2.9000e-004**	**1.0000e-005**	**3.0000e-004**	**0.0000**	**0.9151**	**0.9151**	**2.0000e-005**	**0.0000**	**0.9156**

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	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Total	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Mitigated 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	1.4000e-004	3.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0428	0.0428	0.0000	0.0000	0.0428
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	2.6000e-004	2.8400e-003	1.0000e-005	1.0700e-003	1.0000e-005	1.0800e-003	2.8000e-004	1.0000e-005	2.9000e-004	0.0000	0.8724	0.8724	2.0000e-005	0.0000	0.8728
Total	**3.9000e-004**	**4.0000e-004**	**2.8700e-003**	**1.0000e-005**	**1.0900e-003**	**1.0000e-005**	**1.1000e-003**	**2.9000e-004**	**1.0000e-005**	**3.0000e-004**	**0.0000**	**0.9151**	**0.9151**	**2.0000e-005**	**0.0000**	**0.9156**

3.6 Fenders, Wharf Appurtenances, Utilities - 2021

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	8.6600e-003	0.0806	0.0851	1.4000e-004		4.2400e-003	4.2400e-003		3.9400e-003	3.9400e-003	0.0000	11.2710	11.2710	3.2800e-003	0.0000	11.3530
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.6600e-003**	**0.0806**	**0.0851**	**1.4000e-004**		**4.2400e-003**	**4.2400e-003**		**3.9400e-003**	**3.9400e-003**	**0.0000**	**11.2710**	**11.2710**	**3.2800e-003**	**0.0000**	**11.3530**

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	1.3000e-004	3.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0355	0.0355	0.0000	0.0000	0.0355
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	3.7000e-004	2.6000e-004	2.7500e-003	1.0000e-005	9.5000e-004	1.0000e-005	9.6000e-004	2.5000e-004	1.0000e-005	2.6000e-004	0.0000	0.8054	0.8054	2.0000e-005	0.0000	0.8058
Total	**3.7000e-004**	**3.9000e-004**	**2.7800e-003**	**1.0000e-005**	**9.7000e-004**	**1.0000e-005**	**9.8000e-004**	**2.6000e-004**	**1.0000e-005**	**2.7000e-004**	**0.0000**	**0.8408**	**0.8408**	**2.0000e-005**	**0.0000**	**0.8413**

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	8.6600e-003	0.0806	0.0851	1.4000e-004		4.2400e-003	4.2400e-003		3.9400e-003	3.9400e-003	0.0000	11.2710	11.2710	3.2800e-003	0.0000	11.3530
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.6600e-003**	**0.0806**	**0.0851**	**1.4000e-004**		**4.2400e-003**	**4.2400e-003**		**3.9400e-003**	**3.9400e-003**	**0.0000**	**11.2710**	**11.2710**	**3.2800e-003**	**0.0000**	**11.3530**

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					

	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
Hauling	0.0000	1.3000e-004	3.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0355	0.0355	0.0000	0.0000	0.0355
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	3.7000e-004	2.6000e-004	2.7500e-003	1.0000e-005	9.5000e-004	1.0000e-005	9.6000e-004	2.5000e-004	1.0000e-005	2.6000e-004	0.0000	0.8054	0.8054	2.0000e-005	0.0000	0.8058
Total	**3.7000e-004**	**3.9000e-004**	**2.7800e-003**	**1.0000e-005**	**9.7000e-004**	**1.0000e-005**	**9.8000e-004**	**2.6000e-004**	**1.0000e-005**	**2.7000e-004**	**0.0000**	**0.8408**	**0.8408**	**2.0000e-005**	**0.0000**	**0.8413**

3.6 Fenders, Wharf Appurtenances, Utilities - 2022

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	0.0168	0.1539	0.1829	2.9000e-004		7.7000e-003	7.7000e-003		7.1700e-003	7.1700e-003	0.0000	24.4318	24.4318	7.1200e-003	0.0000	24.6097
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0168**	**0.1539**	**0.1829**	**2.9000e-004**		**7.7000e-003**	**7.7000e-003**		**7.1700e-003**	**7.1700e-003**	**0.0000**	**24.4318**	**24.4318**	**7.1200e-003**	**0.0000**	**24.6097**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	2.5000e-004	5.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0758	0.0758	0.0000	0.0000	0.0759
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	7.5000e-004	5.0000e-004	5.4700e-003	2.0000e-005	2.0600e-003	1.0000e-005	2.0800e-003	5.5000e-004	1.0000e-005	5.6000e-004	0.0000	1.6801	1.6801	4.0000e-005	0.0000	1.6810
Total	**7.6000e-004**	**7.5000e-004**	**5.5200e-003**	**2.0000e-005**	**2.0800e-003**	**1.0000e-005**	**2.1000e-003**	**5.6000e-004**	**1.0000e-005**	**5.7000e-004**	**0.0000**	**1.7560**	**1.7560**	**4.0000e-005**	**0.0000**	**1.7569**

Mitigated Construction On-Site

Category	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
	tons/yr										MT/yr					
Off-Road	0.0168	0.1539	0.1829	2.9000e-004		7.7000e-003	7.7000e-003		7.1700e-003	7.1700e-003	0.0000	24.4318	24.4318	7.1200e-003	0.0000	24.6097
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0168**	**0.1539**	**0.1829**	**2.9000e-004**		**7.7000e-003**	**7.7000e-003**		**7.1700e-003**	**7.1700e-003**	**0.0000**	**24.4318**	**24.4318**	**7.1200e-003**	**0.0000**	**24.6097**

Mitigated Construction Off-Site

Category	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
	tons/yr										MT/yr					
Hauling	1.0000e-005	2.5000e-004	5.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0758	0.0758	0.0000	0.0000	0.0759
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	7.5000e-004	5.0000e-004	5.4700e-003	2.0000e-005	2.0600e-003	1.0000e-005	2.0800e-003	5.5000e-004	1.0000e-005	5.6000e-004	0.0000	1.6801	1.6801	4.0000e-005	0.0000	1.6810
Total	**7.6000e-004**	**7.5000e-004**	**5.5200e-003**	**2.0000e-005**	**2.0800e-003**	**1.0000e-005**	**2.1000e-003**	**5.6000e-004**	**1.0000e-005**	**5.7000e-004**	**0.0000**	**1.7560**	**1.7560**	**4.0000e-005**	**0.0000**	**1.7569**

3.7 Punch List and Final Completion - 2022

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	0.0000					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	7.0400e-003	9.0700e-003	1.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	1.2766	1.2766	8.0000e-005	0.0000	1.2787
Total	**1.0200e-003**	**7.0400e-003**	**9.0700e-003**	**1.0000e-005**		**4.1000e-004**	**4.1000e-004**		**4.1000e-004**	**4.1000e-004**	**0.0000**	**1.2766**	**1.2766**	**8.0000e-005**	**0.0000**	**1.2787**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	2.5000e-004	5.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0739	0.0739	0.0000	0.0000	0.0740
Vendor	2.0000e-005	4.9000e-004	1.2000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1280	0.1280	1.0000e-005	0.0000	0.1282
Worker	1.4000e-004	1.0000e-004	1.0500e-003	0.0000	4.0000e-004	0.0000	4.0000e-004	1.1000e-004	0.0000	1.1000e-004	0.0000	0.3231	0.3231	1.0000e-005	0.0000	0.3233
Total	**1.7000e-004**	**8.4000e-004**	**1.2200e-003**	**0.0000**	**4.5000e-004**	**0.0000**	**4.5000e-004**	**1.2000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.5250**	**0.5250**	**2.0000e-005**	**0.0000**	**0.5254**

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	0.0000					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	7.0400e-003	9.0700e-003	1.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	1.2766	1.2766	8.0000e-005	0.0000	1.2787
Total	**1.0200e-003**	**7.0400e-003**	**9.0700e-003**	**1.0000e-005**		**4.1000e-004**	**4.1000e-004**		**4.1000e-004**	**4.1000e-004**	**0.0000**	**1.2766**	**1.2766**	**8.0000e-005**	**0.0000**	**1.2787**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	2.5000e-004	5.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0739	0.0739	0.0000	0.0000	0.0740
Vendor	2.0000e-005	4.9000e-004	1.2000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1280	0.1280	1.0000e-005	0.0000	0.1282
Worker	1.4000e-004	1.0000e-004	1.0500e-003	0.0000	4.0000e-004	0.0000	4.0000e-004	1.1000e-004	0.0000	1.1000e-004	0.0000	0.3231	0.3231	1.0000e-005	0.0000	0.3233
Total	**1.7000e-004**	**8.4000e-004**	**1.2200e-003**	**0.0000**	**4.5000e-004**	**0.0000**	**4.5000e-004**	**1.2000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.5250**	**0.5250**	**2.0000e-005**	**0.0000**	**0.5254**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.590657	0.037535	0.185105	0.118290	0.015611	0.005013	0.010768	0.024764	0.001635	0.001742	0.005351	0.002726	0.000802

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

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

NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Unmitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

Mitigated

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

Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

7.0 Water Detail

7.1 Mitigation Measures Water

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

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

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

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

AMPORTS Landside Construction

Contra Costa County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	25.33	1000sqft	0.58	25,328.00	0
Parking Lot	20.00	Acre	20.49	871,200.00	0
Other Asphalt Surfaces	0.35	Acre	0.35	15,376.68	0
Other Non-Asphalt Surfaces	7.60	Acre	17.48	331,056.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 58

Climate Zone 4 **Operational Year** 2023

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 - PD

Construction Phase - Project Specific Construction Schedule provided by applicant

Off-road Equipment - No offroad equip

Off-road Equipment - No offroad equip

Off-road Equipment - Applicant provided data

Off-road Equipment - Applicant provided information

Off-road Equipment - Applicant provided information

Off-road Equipment - Applicant provided information

Off-road Equipment - Applicant provided information

Off-road Equipment - Applicant provided information

Off-road Equipment - applicant provided information

Off-road Equipment - applicant provided information

Off-road Equipment - No offroad equipment

Trips and VMT - Based on applicant provided information

Off-road Equipment - Applicant provided information

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	740.00	45.00
tblConstructionPhase	NumDays	740.00	20.00
tblConstructionPhase	NumDays	50.00	5.00
tblConstructionPhase	NumDays	50.00	5.00
tblConstructionPhase	NumDays	50.00	5.00
tblConstructionPhase	NumDays	55.00	60.00
tblConstructionPhase	NumDays	740.00	20.00
tblConstructionPhase	NumDays	740.00	20.00
tblConstructionPhase	NumDays	740.00	20.00
tblConstructionPhase	NumDays	740.00	5.00
tblLandUse	LandUseSquareFeet	25,330.00	25,328.00
tblLandUse	LandUseSquareFeet	15,246.00	15,376.68
tblLandUse	LotAcreage	20.00	20.49
tblLandUse	LotAcreage	7.60	17.48
tblOffRoadEquipment	HorsePower	81.00	40.00
tblOffRoadEquipment	HorsePower	231.00	226.00
tblOffRoadEquipment	HorsePower	158.00	162.00
tblOffRoadEquipment	HorsePower	158.00	162.00
tblOffRoadEquipment	HorsePower	158.00	162.00

tblOffRoadEquipment	HorsePower	263.00	225.00
tblOffRoadEquipment	HorsePower	63.00	62.00
tblOffRoadEquipment	HorsePower	231.00	226.00
tblOffRoadEquipment	LoadFactor	0.30	0.78
tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes
tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Rollers
tblOffRoadEquipment	OffRoadEquipmentType		Plate Compactors
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Rollers
tblOffRoadEquipment	OffRoadEquipmentType		Surfacing Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes
tblOffRoadEquipment	OffRoadEquipmentType		Aerial Lifts
tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentType		Welders
tblOffRoadEquipment	OffRoadEquipmentType		Cranes
tblOffRoadEquipment	OffRoadEquipmentType		Forklifts
tblOffRoadEquipment	OffRoadEquipmentType		Forklifts
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	PhaseName		Demolition
tblOffRoadEquipment	PhaseName		Utilities
tblOffRoadEquipment	PhaseName		Utilities
tblOffRoadEquipment	PhaseName		Utilities
tblOffRoadEquipment	PhaseName		Utilities
tblOffRoadEquipment	PhaseName		Construct Building Foundations
tblOffRoadEquipment	PhaseName		Construct Building Foundations
tblOffRoadEquipment	PhaseName		Site Paving
tblOffRoadEquipment	PhaseName		Site Paving
tblOffRoadEquipment	PhaseName		Building Finishes
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	7.00	0.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	7.00	6.00

tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	7.00	0.00
tblOffRoadEquipment	UsageHours	7.00	0.00
tblOffRoadEquipment	UsageHours	7.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	7.00	0.00
tblOffRoadEquipment	UsageHours	7.00	0.00
tblOffRoadEquipment	UsageHours	7.00	0.00
tblOffRoadEquipment	UsageHours	7.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblTripsAndVMT	HaulingTripNumber	0.00	108.00
tblTripsAndVMT	HaulingTripNumber	0.00	15.00

tblTripsAndVMT	HaulingTripNumber	0.00	5.00
tblTripsAndVMT	HaulingTripNumber	0.00	10.00
tblTripsAndVMT	HaulingTripNumber	0.00	399.00
tblTripsAndVMT	HaulingTripNumber	0.00	5.00
tblTripsAndVMT	HaulingTripNumber	0.00	15.00
tblTripsAndVMT	PhaseName		Utilities
tblTripsAndVMT	VendorTripNumber	204.00	0.00
tblTripsAndVMT	VendorTripNumber	204.00	0.00
tblTripsAndVMT	VendorTripNumber	0.00	10.00
tblTripsAndVMT	VendorTripNumber	0.00	10.00
tblTripsAndVMT	VendorTripNumber	0.00	10.00
tblTripsAndVMT	VendorTripNumber	0.00	6.00
tblTripsAndVMT	VendorTripNumber	204.00	0.00
tblTripsAndVMT	VendorTripNumber	204.00	10.00
tblTripsAndVMT	VendorTripNumber	204.00	0.00
tblTripsAndVMT	VendorTripNumber	204.00	0.00
tblTripsAndVMT	WorkerTripNumber	522.00	48.00
tblTripsAndVMT	WorkerTripNumber	522.00	48.00
tblTripsAndVMT	WorkerTripNumber	15.00	48.00
tblTripsAndVMT	WorkerTripNumber	15.00	48.00
tblTripsAndVMT	WorkerTripNumber	15.00	48.00
tblTripsAndVMT	WorkerTripNumber	15.00	48.00
tblTripsAndVMT	WorkerTripNumber	522.00	48.00
tblTripsAndVMT	WorkerTripNumber	522.00	48.00
tblTripsAndVMT	WorkerTripNumber	522.00	48.00
tblTripsAndVMT	WorkerTripNumber	522.00	48.00

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					
2021	2.9200e-003	0.0239	0.0208	6.0000e-005	2.7900e-003	8.2000e-004	3.6200e-003	7.5000e-004	7.7000e-004	1.5200e-003	0.0000	5.5405	5.5405	6.0000e-004	0.0000	5.5556
2022	0.1503	1.1980	1.2053	2.7600e-003	0.0545	0.0497	0.1042	0.0146	0.0460	0.0606	0.0000	245.0673	245.0673	0.0575	0.0000	246.5053
Maximum	**0.1503**	**1.1980**	**1.2053**	**2.7600e-003**	**0.0545**	**0.0497**	**0.1042**	**0.0146**	**0.0460**	**0.0606**	**0.0000**	**245.0673**	**245.0673**	**0.0575**	**0.0000**	**246.5053**

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					
2021	2.9200e-003	0.0239	0.0208	6.0000e-005	2.7900e-003	8.2000e-004	3.6200e-003	7.5000e-004	7.7000e-004	1.5200e-003	0.0000	5.5405	5.5405	6.0000e-004	0.0000	5.5556
2022	0.1503	0.8167	1.2053	2.7600e-003	0.0545	0.0497	0.1042	0.0146	0.0460	0.0606	0.0000	245.0670	245.0670	0.0575	0.0000	246.5051
Maximum	**0.1503**	**0.8167**	**1.2053**	**2.7600e-003**	**0.0545**	**0.0497**	**0.1042**	**0.0146**	**0.0460**	**0.0606**	**0.0000**	**245.0670**	**245.0670**	**0.0575**	**0.0000**	**246.5051**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**31.20**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	**Start Date**	**End Date**	**Maximum Unmitigated ROG + NOX (tons/quarter)**	**Maximum Mitigated ROG + NOX (tons/quarter)**
1	**12-16-2021**	**3-15-2022**	0.2216	0.2169
2	**3-16-2022**	**6-15-2022**	0.9444	0.6029
3	**6-16-2022**	**9-15-2022**	0.2081	0.1730
		Highest	0.9444	0.6029

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Demolition	12/16/2021	12/22/2021	5	5	
2	Erosion Control	Demolition	12/23/2021	12/29/2021	5	5	
3	Demolition	Demolition	12/30/2021	1/5/2022	5	5	
4	Utilities	Trenching	1/6/2022	3/30/2022	5	60	
5	Construct Building Foundations	Building Construction	3/31/2022	6/1/2022	5	45	
6	Site Paving	Paving	3/31/2022	6/22/2022	5	60	
7	Erect Light Poles	Building Construction	3/31/2022	4/27/2022	5	20	
8	Erect Pre-Engineered Metal Building	Building Construction	6/10/2022	7/7/2022	5	20	
9	Building Interior Construction	Building Construction	7/8/2022	8/4/2022	5	20	
10	Building Finishes	Building Construction	8/5/2022	9/1/2022	5	20	
11	Punch List and Final Completion	Building Construction	9/2/2022	9/8/2022	5	5	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 38.32

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Erect Pre-Engineered Metal Building	Cranes	1	6.00	226	0.29
Erect Pre-Engineered Metal Building	Forklifts	2	6.00	89	0.20
Erect Pre-Engineered Metal Building	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Site Paving	Pavers	2	6.00	130	0.42
Site Paving	Rollers	2	6.00	80	0.38
Utilities	Tractors/Loaders/Backhoes	2	6.00	97	0.37

Construct Building Foundations	Cranes	0	0.00	231	0.29
Construct Building Foundations	Forklifts	0	0.00	89	0.20
Construct Building Foundations	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Erosion Control	Concrete/Industrial Saws	0	0.00	81	0.73
Erosion Control	Rubber Tired Dozers	0	0.00	247	0.40
Utilities	Excavators	1	6.00	162	0.38
Mobilization	Concrete/Industrial Saws	0	0.00	81	0.73
Mobilization	Rubber Tired Dozers	0	0.00	247	0.40
Utilities	Rollers	1	6.00	80	0.38
Demolition	Concrete/Industrial Saws	2	6.00	40	0.73
Demolition	Rubber Tired Dozers	1	6.00	247	0.40
Utilities	Plate Compactors	1	6.00	8	0.43
Demolition	Excavators	1	6.00	162	0.38
Construct Building Foundations	Excavators	1	6.00	162	0.38
Construct Building Foundations	Rollers	1	6.00	80	0.38
Site Paving	Surfacing Equipment	2	6.00	225	0.78
Site Paving	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Building Interior Construction		1	6.00	62	0.31
Building Finishes	Aerial Lifts	1	6.00	62	0.31
Erect Pre-Engineered Metal Building	Generator Sets	1	6.00	84	0.74
Erect Pre-Engineered Metal Building	Welders	3	6.00	46	0.45
Erect Light Poles	Cranes	1	6.00	226	0.29
Building Interior Construction	Forklifts	1	6.00	89	0.20
Building Finishes	Forklifts	1	6.00	89	0.20
Building Finishes	Cranes	0	0.00	231	0.29
Punch List and Final Completion	Cranes	0	0.00	231	0.29
Building Interior Construction	Cranes	0	0.00	231	0.29
Mobilization	Excavators	0	0.00	158	0.38
Erosion Control	Excavators	0	0.00	158	0.38
Punch List and Final Completion	Forklifts	0	0.00	89	0.20

Erect Light Poles	Forklifts		0	0.00	89	0.20
Building Finishes	Generator Sets		0	0.00	84	0.74
Punch List and Final Completion	Generator Sets		0	0.00	84	0.74
Construct Building Foundations	Generator Sets		0	0.00	84	0.74
Erect Light Poles	Generator Sets		0	0.00	84	0.74
Building Interior Construction	Generator Sets		0	0.00	84	0.74
Site Paving	Paving Equipment		0	0.00	132	0.36
Building Finishes	Tractors/Loaders/Backhoes		0	0.00	97	0.37
Punch List and Final Completion	Tractors/Loaders/Backhoes		0	0.00	97	0.37
Erect Light Poles	Tractors/Loaders/Backhoes		0	0.00	97	0.37
Building Interior Construction	Tractors/Loaders/Backhoes		0	0.00	97	0.37
Building Finishes	Welders		0	0.00	46	0.45
Punch List and Final Completion	Welders		0	0.00	46	0.45
Construct Building Foundations	Welders		0	0.00	46	0.45
Erect Light Poles	Welders		0	0.00	46	0.45
Building Interior Construction	Welders		0	0.00	46	0.45

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
Construct Building Foundations	9	48.00	0.00	108.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Erect Pre-Engineered Metal Building	9	48.00	0.00	15.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Mobilization	6	48.00	10.00	5.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Erosion Control	6	48.00	10.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	6	48.00	10.00	10.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Paving	6	48.00	0.00	399.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Utilities	0	48.00	6.00	30.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Finishes	9	48.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Punch List and Final Completion	9	48.00	10.00	5.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Erect Light Poles	9	48.00	0.00	15.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

Building Interior Construction	9	48.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Mobilization - 2021

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	0.0000	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**

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	2.0000e-005	6.7000e-004	1.3000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1872	0.1872	1.0000e-005	0.0000	0.1874
Vendor	8.0000e-005	2.5800e-003	6.6000e-004	1.0000e-005	1.6000e-004	1.0000e-005	1.7000e-004	5.0000e-005	1.0000e-005	5.0000e-005	0.0000	0.6463	0.6463	3.0000e-005	0.0000	0.6470
Worker	3.7000e-004	2.6000e-004	2.7500e-003	1.0000e-005	9.5000e-004	1.0000e-005	9.6000e-004	2.5000e-004	1.0000e-005	2.6000e-004	0.0000	0.8054	0.8054	2.0000e-005	0.0000	0.8058
Total	**4.7000e-004**	**3.5100e-003**	**3.5400e-003**	**2.0000e-005**	**1.1500e-003**	**2.0000e-005**	**1.1700e-003**	**3.1000e-004**	**2.0000e-005**	**3.2000e-004**	**0.0000**	**1.6388**	**1.6388**	**6.0000e-005**	**0.0000**	**1.6403**

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	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated 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	2.0000e-005	6.7000e-004	1.3000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1872	0.1872	1.0000e-005	0.0000	0.1874
Vendor	8.0000e-005	2.5800e-003	6.6000e-004	1.0000e-005	1.6000e-004	1.0000e-005	1.7000e-004	5.0000e-005	1.0000e-005	5.0000e-005	0.0000	0.6463	0.6463	3.0000e-005	0.0000	0.6470
Worker	3.7000e-004	2.6000e-004	2.7500e-003	1.0000e-005	9.5000e-004	1.0000e-005	9.6000e-004	2.5000e-004	1.0000e-005	2.6000e-004	0.0000	0.8054	0.8054	2.0000e-005	0.0000	0.8058
Total	**4.7000e-004**	**3.5100e-003**	**3.5400e-003**	**2.0000e-005**	**1.1500e-003**	**2.0000e-005**	**1.1700e-003**	**3.1000e-004**	**2.0000e-005**	**3.2000e-004**	**0.0000**	**1.6388**	**1.6388**	**6.0000e-005**	**0.0000**	**1.6403**

3.3 Erosion Control - 2021

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	0.0000	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**

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	8.0000e-005	2.5800e-003	6.6000e-004	1.0000e-005	1.6000e-004	1.0000e-005	1.7000e-004	5.0000e-005	1.0000e-005	5.0000e-005	0.0000	0.6463	0.6463	3.0000e-005	0.0000	0.6470
Worker	3.7000e-004	2.6000e-004	2.7500e-003	1.0000e-005	9.5000e-004	1.0000e-005	9.6000e-004	2.5000e-004	1.0000e-005	2.6000e-004	0.0000	0.8054	0.8054	2.0000e-005	0.0000	0.8058
Total	**4.5000e-004**	**2.8400e-003**	**3.4100e-003**	**2.0000e-005**	**1.1100e-003**	**2.0000e-005**	**1.1300e-003**	**3.0000e-004**	**2.0000e-005**	**3.1000e-004**	**0.0000**	**1.4516**	**1.4516**	**5.0000e-005**	**0.0000**	**1.4528**

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	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

Category	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
	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	8.0000e-005	2.5800e-003	6.6000e-004	1.0000e-005	1.6000e-004	1.0000e-005	1.7000e-004	5.0000e-005	1.0000e-005	5.0000e-005	0.0000	0.6463	0.6463	3.0000e-005	0.0000	0.6470
Worker	3.7000e-004	2.6000e-004	2.7500e-003	1.0000e-005	9.5000e-004	1.0000e-005	9.6000e-004	2.5000e-004	1.0000e-005	2.6000e-004	0.0000	0.8054	0.8054	2.0000e-005	0.0000	0.8058
Total	**4.5000e-004**	**2.8400e-003**	**3.4100e-003**	**2.0000e-005**	**1.1100e-003**	**2.0000e-005**	**1.1300e-003**	**3.0000e-004**	**2.0000e-005**	**3.1000e-004**	**0.0000**	**1.4516**	**1.4516**	**5.0000e-005**	**0.0000**	**1.4528**

3.4 Demolition - 2021

Unmitigated Construction On-Site

Category	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
	tons/yr										MT/yr					
Off-Road	1.8000e-003	0.0159	0.0124	2.0000e-005		7.9000e-004	7.9000e-004		7.4000e-004	7.4000e-004	0.0000	1.7196	1.7196	4.7000e-004	0.0000	1.7314
Total	**1.8000e-003**	**0.0159**	**0.0124**	**2.0000e-005**		**7.9000e-004**	**7.9000e-004**		**7.4000e-004**	**7.4000e-004**	**0.0000**	**1.7196**	**1.7196**	**4.7000e-004**	**0.0000**	**1.7314**

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	2.0000e-005	5.4000e-004	1.1000e-004	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.1498	0.1498	1.0000e-005	0.0000	0.1500
Vendor	3.0000e-005	1.0300e-003	2.6000e-004	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.2585	0.2585	1.0000e-005	0.0000	0.2588
Worker	1.5000e-004	1.0000e-004	1.1000e-003	0.0000	3.8000e-004	0.0000	3.8000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3221	0.3221	1.0000e-005	0.0000	0.3223
Total	**2.0000e-004**	**1.6700e-003**	**1.4700e-003**	**0.0000**	**5.2000e-004**	**0.0000**	**5.2000e-004**	**1.4000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**0.7304**	**0.7304**	**3.0000e-005**	**0.0000**	**0.7311**

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	1.8000e-003	0.0159	0.0124	2.0000e-005		7.9000e-004	7.9000e-004		7.4000e-004	7.4000e-004	0.0000	1.7196	1.7196	4.7000e-004	0.0000	1.7314
Total	**1.8000e-003**	**0.0159**	**0.0124**	**2.0000e-005**		**7.9000e-004**	**7.9000e-004**		**7.4000e-004**	**7.4000e-004**	**0.0000**	**1.7196**	**1.7196**	**4.7000e-004**	**0.0000**	**1.7314**

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	2.0000e-005	5.4000e-004	1.1000e-004	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.1498	0.1498	1.0000e-005	0.0000	0.1500
Vendor	3.0000e-005	1.0300e-003	2.6000e-004	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.2585	0.2585	1.0000e-005	0.0000	0.2588
Worker	1.5000e-004	1.0000e-004	1.1000e-003	0.0000	3.8000e-004	0.0000	3.8000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3221	0.3221	1.0000e-005	0.0000	0.3223
Total	**2.0000e-004**	**1.6700e-003**	**1.4700e-003**	**0.0000**	**5.2000e-004**	**0.0000**	**5.2000e-004**	**1.4000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**0.7304**	**0.7304**	**3.0000e-005**	**0.0000**	**0.7311**

3.4 Demolition - 2022

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	2.3100e-003	0.0203	0.0179	3.0000e-005		9.5000e-004	9.5000e-004		8.9000e-004	8.9000e-004	0.0000	2.5796	2.5796	7.0000e-004	0.0000	2.5971
Total	**2.3100e-003**	**0.0203**	**0.0179**	**3.0000e-005**		**9.5000e-004**	**9.5000e-004**		**8.9000e-004**	**8.9000e-004**	**0.0000**	**2.5796**	**2.5796**	**7.0000e-004**	**0.0000**	**2.5971**

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	2.0000e-005	7.4000e-004	1.6000e-004	0.0000	8.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.2217	0.2217	1.0000e-005	0.0000	0.2219
Vendor	5.0000e-005	1.4600e-003	3.7000e-004	0.0000	1.0000e-004	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.3841	0.3841	2.0000e-005	0.0000	0.3845
Worker	2.1000e-004	1.4000e-004	1.5100e-003	1.0000e-005	5.7000e-004	0.0000	5.7000e-004	1.5000e-004	0.0000	1.6000e-004	0.0000	0.4653	0.4653	1.0000e-005	0.0000	0.4655
Total	**2.8000e-004**	**2.3400e-003**	**2.0400e-003**	**1.0000e-005**	**7.5000e-004**	**0.0000**	**7.5000e-004**	**2.0000e-004**	**0.0000**	**2.1000e-004**	**0.0000**	**1.0710**	**1.0710**	**4.0000e-005**	**0.0000**	**1.0719**

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	2.3100e-003	0.0203	0.0179	3.0000e-005		9.5000e-004	9.5000e-004		8.9000e-004	8.9000e-004	0.0000	2.5796	2.5796	7.0000e-004	0.0000	2.5971
Total	**2.3100e-003**	**0.0203**	**0.0179**	**3.0000e-005**		**9.5000e-004**	**9.5000e-004**		**8.9000e-004**	**8.9000e-004**	**0.0000**	**2.5796**	**2.5796**	**7.0000e-004**	**0.0000**	**2.5971**

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	2.0000e-005	7.4000e-004	1.6000e-004	0.0000	8.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.2217	0.2217	1.0000e-005	0.0000	0.2219
Vendor	5.0000e-005	1.4600e-003	3.7000e-004	0.0000	1.0000e-004	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.3841	0.3841	2.0000e-005	0.0000	0.3845
Worker	2.1000e-004	1.4000e-004	1.5100e-003	1.0000e-005	5.7000e-004	0.0000	5.7000e-004	1.5000e-004	0.0000	1.6000e-004	0.0000	0.4653	0.4653	1.0000e-005	0.0000	0.4655
Total	**2.8000e-004**	**2.3400e-003**	**2.0400e-003**	**1.0000e-005**	**7.5000e-004**	**0.0000**	**7.5000e-004**	**2.0000e-004**	**0.0000**	**2.1000e-004**	**0.0000**	**1.0710**	**1.0710**	**4.0000e-005**	**0.0000**	**1.0719**

3.5 Utilities - 2022

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	0.0167	0.1609	0.2224	3.3000e-004		8.5000e-003	8.5000e-003		7.8300e-003	7.8300e-003	0.0000	28.6526	28.6526	9.1100e-003	0.0000	28.8804
Total	**0.0167**	**0.1609**	**0.2224**	**3.3000e-004**		**8.5000e-003**	**8.5000e-003**		**7.8300e-003**	**7.8300e-003**	**0.0000**	**28.6526**	**28.6526**	**9.1100e-003**	**0.0000**	**28.8804**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.1000e-004	3.6800e-003	7.8000e-004	1.0000e-005	2.5000e-004	1.0000e-005	2.6000e-004	7.0000e-005	1.0000e-005	8.0000e-005	0.0000	1.1084	1.1084	5.0000e-005	0.0000	1.1096
Vendor	5.5000e-004	0.0176	4.4300e-003	5.0000e-005	1.1800e-003	4.0000e-005	1.2200e-003	3.4000e-004	3.0000e-005	3.8000e-004	0.0000	4.6090	4.6090	2.0000e-004	0.0000	4.6141
Worker	4.1500e-003	2.7900e-003	0.0303	1.0000e-004	0.0114	7.0000e-005	0.0115	3.0400e-003	7.0000e-005	3.1000e-003	0.0000	9.3054	9.3054	2.0000e-004	0.0000	9.3103
Total	**4.8100e-003**	**0.0240**	**0.0355**	**1.6000e-004**	**0.0129**	**1.2000e-004**	**0.0130**	**3.4500e-003**	**1.1000e-004**	**3.5600e-003**	**0.0000**	**15.0227**	**15.0227**	**4.5000e-004**	**0.0000**	**15.0340**

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	0.0167	0.1552	0.2224	3.3000e-004		8.5000e-003	8.5000e-003		7.8300e-003	7.8300e-003	0.0000	28.6525	28.6525	9.1100e-003	0.0000	28.8803

Total	0.0167	0.1552	0.2224	3.3000e-004		8.5000e-003	8.5000e-003		7.8300e-003	7.8300e-003	0.0000	28.6525	28.6525	9.1100e-003	0.0000	28.8803

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.1000e-004	3.6800e-003	7.8000e-004	1.0000e-005	2.5000e-004	1.0000e-005	2.6000e-004	7.0000e-005	1.0000e-005	8.0000e-005	0.0000	1.1084	1.1084	5.0000e-005	0.0000	1.1096
Vendor	5.5000e-004	0.0176	4.4300e-003	5.0000e-005	1.1800e-003	4.0000e-005	1.2200e-003	3.4000e-004	3.0000e-005	3.8000e-004	0.0000	4.6090	4.6090	2.0000e-004	0.0000	4.6141
Worker	4.1500e-003	2.7900e-003	0.0303	1.0000e-004	0.0114	7.0000e-005	0.0115	3.0400e-003	7.0000e-005	3.1000e-003	0.0000	9.3054	9.3054	2.0000e-004	0.0000	9.3103
Total	**4.8100e-003**	**0.0240**	**0.0355**	**1.6000e-004**	**0.0129**	**1.2000e-004**	**0.0130**	**3.4500e-003**	**1.1000e-004**	**3.5600e-003**	**0.0000**	**15.0227**	**15.0227**	**4.5000e-004**	**0.0000**	**15.0340**

3.6 Construct Building Foundations - 2022

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	0.0119	0.1164	0.1633	2.4000e-004		6.2100e-003	6.2100e-003		5.7100e-003	5.7100e-003	0.0000	20.9616	20.9616	6.7800e-003	0.0000	21.1311
Total	**0.0119**	**0.1164**	**0.1633**	**2.4000e-004**		**6.2100e-003**	**6.2100e-003**		**5.7100e-003**	**5.7100e-003**	**0.0000**	**20.9616**	**20.9616**	**6.7800e-003**	**0.0000**	**21.1311**

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	4.0000e-004	0.0133	2.8100e-003	4.0000e-005	9.1000e-004	4.0000e-005	9.5000e-004	2.5000e-004	4.0000e-005	2.9000e-004	0.0000	3.9902	3.9902	1.7000e-004	0.0000	3.9945
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	3.1100e-003	2.1000e-003	0.0227	8.0000e-005	8.5700e-003	5.0000e-005	8.6200e-003	2.2800e-003	5.0000e-005	2.3300e-003	0.0000	6.9790	6.9790	1.5000e-004	0.0000	6.9827
Total	**3.5100e-003**	**0.0154**	**0.0255**	**1.2000e-004**	**9.4800e-003**	**9.0000e-005**	**9.5700e-003**	**2.5300e-003**	**9.0000e-005**	**2.6200e-003**	**0.0000**	**10.9692**	**10.9692**	**3.2000e-004**	**0.0000**	**10.9772**

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	0.0119	0.1164	0.1632	2.4000e-004		6.2100e-003	6.2100e-003		5.7100e-003	5.7100e-003	0.0000	20.9616	20.9616	6.7800e-003	0.0000	21.1310
Total	**0.0119**	**0.1164**	**0.1632**	**2.4000e-004**		**6.2100e-003**	**6.2100e-003**		**5.7100e-003**	**5.7100e-003**	**0.0000**	**20.9616**	**20.9616**	**6.7800e-003**	**0.0000**	**21.1310**

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	4.0000e-004	0.0133	2.8100e-003	4.0000e-005	9.1000e-004	4.0000e-005	9.5000e-004	2.5000e-004	4.0000e-005	2.9000e-004	0.0000	3.9902	3.9902	1.7000e-004	0.0000	3.9945
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	3.1100e-003	2.1000e-003	0.0227	8.0000e-005	8.5700e-003	5.0000e-005	8.6200e-003	2.2800e-003	5.0000e-005	2.3300e-003	0.0000	6.9790	6.9790	1.5000e-004	0.0000	6.9827
Total	**3.5100e-003**	**0.0154**	**0.0255**	**1.2000e-004**	**9.4800e-003**	**9.0000e-005**	**9.5700e-003**	**2.5300e-003**	**9.0000e-005**	**2.6200e-003**	**0.0000**	**10.9692**	**10.9692**	**3.2000e-004**	**0.0000**	**10.9772**

3.7 Site Paving - 2022

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	0.0515	0.6190	0.4838	1.1600e-003		0.0249	0.0249		0.0229	0.0229	0.0000	101.5236	101.5236	0.0328	0.0000	102.3445
Paving	0.0273					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0788**	**0.6190**	**0.4838**	**1.1600e-003**		**0.0249**	**0.0249**		**0.0229**	**0.0229**	**0.0000**	**101.5236**	**101.5236**	**0.0328**	**0.0000**	**102.3445**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.4600e-003	0.0490	0.0104	1.5000e-004	3.3800e-003	1.4000e-004	3.5200e-003	9.3000e-004	1.4000e-004	1.0700e-003	0.0000	14.7414	14.7414	6.4000e-004	0.0000	14.7573
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	4.1500e-003	2.7900e-003	0.0303	1.0000e-004	0.0114	7.0000e-005	0.0115	3.0400e-003	7.0000e-005	3.1000e-003	0.0000	9.3054	9.3054	2.0000e-004	0.0000	9.3103
Total	**5.6100e-003**	**0.0518**	**0.0407**	**2.5000e-004**	**0.0148**	**2.1000e-004**	**0.0150**	**3.9700e-003**	**2.1000e-004**	**4.1700e-003**	**0.0000**	**24.0468**	**24.0468**	**8.4000e-004**	**0.0000**	**24.0676**

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	0.0515	0.2475	0.4838	1.1600e-003		0.0249	0.0249		0.0229	0.0229	0.0000	101.5235	101.5235	0.0328	0.0000	102.3444
Paving	0.0273					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0788**	**0.2475**	**0.4838**	**1.1600e-003**		**0.0249**	**0.0249**		**0.0229**	**0.0229**	**0.0000**	**101.5235**	**101.5235**	**0.0328**	**0.0000**	**102.3444**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.4600e-003	0.0490	0.0104	1.5000e-004	3.3800e-003	1.4000e-004	3.5200e-003	9.3000e-004	1.4000e-004	1.0700e-003	0.0000	14.7414	14.7414	6.4000e-004	0.0000	14.7573
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	4.1500e-003	2.7900e-003	0.0303	1.0000e-004	0.0114	7.0000e-005	0.0115	3.0400e-003	7.0000e-005	3.1000e-003	0.0000	9.3054	9.3054	2.0000e-004	0.0000	9.3103
Total	**5.6100e-003**	**0.0518**	**0.0407**	**2.5000e-004**	**0.0148**	**2.1000e-004**	**0.0150**	**3.9700e-003**	**2.1000e-004**	**4.1700e-003**	**0.0000**	**24.0468**	**24.0468**	**8.4000e-004**	**0.0000**	**24.0676**

3.8 Erect Light Poles - 2022

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	2.7400e-003	0.0307	0.0139	4.0000e-005		1.2700e-003	1.2700e-003		1.1700e-003	1.1700e-003	0.0000	3.7199	3.7199	1.2000e-003	0.0000	3.7500
Total	**2.7400e-003**	**0.0307**	**0.0139**	**4.0000e-005**		**1.2700e-003**	**1.2700e-003**		**1.1700e-003**	**1.1700e-003**	**0.0000**	**3.7199**	**3.7199**	**1.2000e-003**	**0.0000**	**3.7500**

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	5.0000e-005	1.8400e-003	3.9000e-004	1.0000e-005	1.3000e-004	1.0000e-005	1.3000e-004	3.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.5542	0.5542	2.0000e-005	0.0000	0.5548
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	1.3800e-003	9.3000e-004	0.0101	3.0000e-005	3.8100e-003	2.0000e-005	3.8300e-003	1.0100e-003	2.0000e-005	1.0300e-003	0.0000	3.1018	3.1018	7.0000e-005	0.0000	3.1034
Total	**1.4300e-003**	**2.7700e-003**	**0.0105**	**4.0000e-005**	**3.9400e-003**	**3.0000e-005**	**3.9600e-003**	**1.0400e-003**	**3.0000e-005**	**1.0700e-003**	**0.0000**	**3.6560**	**3.6560**	**9.0000e-005**	**0.0000**	**3.6582**

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	2.7400e-003	0.0307	0.0139	4.0000e-005		1.2700e-003	1.2700e-003		1.1700e-003	1.1700e-003	0.0000	3.7199	3.7199	1.2000e-003	0.0000	3.7500

Total	2.7400e-003	0.0307	0.0139	4.0000e-005		1.2700e-003	1.2700e-003		1.1700e-003	1.1700e-003	0.0000	3.7199	3.7199	1.2000e-003	0.0000	3.7500

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	5.0000e-005	1.8400e-003	3.9000e-004	1.0000e-005	1.3000e-004	1.0000e-005	1.3000e-004	3.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.5542	0.5542	2.0000e-005	0.0000	0.5548
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	1.3800e-003	9.3000e-004	0.0101	3.0000e-005	3.8100e-003	2.0000e-005	3.8300e-003	1.0100e-003	2.0000e-005	1.0300e-003	0.0000	3.1018	3.1018	7.0000e-005	0.0000	3.1034
Total	**1.4300e-003**	**2.7700e-003**	**0.0105**	**4.0000e-005**	**3.9400e-003**	**3.0000e-005**	**3.9600e-003**	**1.0400e-003**	**3.0000e-005**	**1.0700e-003**	**0.0000**	**3.6560**	**3.6560**	**9.0000e-005**	**0.0000**	**3.6582**

3.9 Erect Pre-Engineered Metal Building - 2022

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	0.0156	0.1265	0.1305	2.2000e-004		6.2100e-003	6.2100e-003		5.9200e-003	5.9200e-003	0.0000	18.3075	18.3075	3.8900e-003	0.0000	18.4047
Total	**0.0156**	**0.1265**	**0.1305**	**2.2000e-004**		**6.2100e-003**	**6.2100e-003**		**5.9200e-003**	**5.9200e-003**	**0.0000**	**18.3075**	**18.3075**	**3.8900e-003**	**0.0000**	**18.4047**

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	5.0000e-005	1.8400e-003	3.9000e-004	1.0000e-005	1.3000e-004	1.0000e-005	1.3000e-004	3.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.5542	0.5542	2.0000e-005	0.0000	0.5548
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	1.3800e-003	9.3000e-004	0.0101	3.0000e-005	3.8100e-003	2.0000e-005	3.8300e-003	1.0100e-003	2.0000e-005	1.0300e-003	0.0000	3.1018	3.1018	7.0000e-005	0.0000	3.1034
Total	**1.4300e-003**	**2.7700e-003**	**0.0105**	**4.0000e-005**	**3.9400e-003**	**3.0000e-005**	**3.9600e-003**	**1.0400e-003**	**3.0000e-005**	**1.0700e-003**	**0.0000**	**3.6560**	**3.6560**	**9.0000e-005**	**0.0000**	**3.6582**

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	0.0156	0.1265	0.1305	2.2000e-004		6.2100e-003	6.2100e-003		5.9200e-003	5.9200e-003	0.0000	18.3075	18.3075	3.8900e-003	0.0000	18.4047
Total	**0.0156**	**0.1265**	**0.1305**	**2.2000e-004**		**6.2100e-003**	**6.2100e-003**		**5.9200e-003**	**5.9200e-003**	**0.0000**	**18.3075**	**18.3075**	**3.8900e-003**	**0.0000**	**18.4047**

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					

	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
Hauling	5.0000e-005	1.8400e-003	3.9000e-004	1.0000e-005	1.3000e-004	1.0000e-005	1.3000e-004	3.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.5542	0.5542	2.0000e-005	0.0000	0.5548
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	1.3800e-003	9.3000e-004	0.0101	3.0000e-005	3.8100e-003	2.0000e-005	3.8300e-003	1.0100e-003	2.0000e-005	1.0300e-003	0.0000	3.1018	3.1018	7.0000e-005	0.0000	3.1034
Total	**1.4300e-003**	**2.7700e-003**	**0.0105**	**4.0000e-005**	**3.9400e-003**	**3.0000e-005**	**3.9600e-003**	**1.0400e-003**	**3.0000e-005**	**1.0700e-003**	**0.0000**	**3.6560**	**3.6560**	**9.0000e-005**	**0.0000**	**3.6582**

3.10 Building Interior Construction - 2022

<u>Unmitigated Construction On-Site</u>

	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	8.5000e-004	7.9100e-003	8.6500e-003	1.0000e-005		5.2000e-004	5.2000e-004		4.8000e-004	4.8000e-004	0.0000	1.0072	1.0072	3.3000e-004	0.0000	1.0153
Total	**8.5000e-004**	**7.9100e-003**	**8.6500e-003**	**1.0000e-005**		**5.2000e-004**	**5.2000e-004**		**4.8000e-004**	**4.8000e-004**	**0.0000**	**1.0072**	**1.0072**	**3.3000e-004**	**0.0000**	**1.0153**

<u>Unmitigated Construction Off-Site</u>

	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	1.3800e-003	9.3000e-004	0.0101	3.0000e-005	3.8100e-003	2.0000e-005	3.8300e-003	1.0100e-003	2.0000e-005	1.0300e-003	0.0000	3.1018	3.1018	7.0000e-005	0.0000	3.1034
Total	**1.3800e-003**	**9.3000e-004**	**0.0101**	**3.0000e-005**	**3.8100e-003**	**2.0000e-005**	**3.8300e-003**	**1.0100e-003**	**2.0000e-005**	**1.0300e-003**	**0.0000**	**3.1018**	**3.1018**	**7.0000e-005**	**0.0000**	**3.1034**

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	8.5000e-004	7.9100e-003	8.6500e-003	1.0000e-005		5.2000e-004	5.2000e-004		4.8000e-004	4.8000e-004	0.0000	1.0072	1.0072	3.3000e-004	0.0000	1.0153
Total	**8.5000e-004**	**7.9100e-003**	**8.6500e-003**	**1.0000e-005**		**5.2000e-004**	**5.2000e-004**		**4.8000e-004**	**4.8000e-004**	**0.0000**	**1.0072**	**1.0072**	**3.3000e-004**	**0.0000**	**1.0153**

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	1.3800e-003	9.3000e-004	0.0101	3.0000e-005	3.8100e-003	2.0000e-005	3.8300e-003	1.0100e-003	2.0000e-005	1.0300e-003	0.0000	3.1018	3.1018	7.0000e-005	0.0000	3.1034
Total	**1.3800e-003**	**9.3000e-004**	**0.0101**	**3.0000e-005**	**3.8100e-003**	**2.0000e-005**	**3.8300e-003**	**1.0100e-003**	**2.0000e-005**	**1.0300e-003**	**0.0000**	**3.1018**	**3.1018**	**7.0000e-005**	**0.0000**	**3.1034**

3.11 Building Finishes - 2022

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	1.1200e-003	0.0120	0.0167	2.0000e-005		6.0000e-004	6.0000e-004		5.5000e-004	5.5000e-004	0.0000	2.0898	2.0898	6.8000e-004	0.0000	2.1066
Total	**1.1200e-003**	**0.0120**	**0.0167**	**2.0000e-005**		**6.0000e-004**	**6.0000e-004**		**5.5000e-004**	**5.5000e-004**	**0.0000**	**2.0898**	**2.0898**	**6.8000e-004**	**0.0000**	**2.1066**

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	1.3800e-003	9.3000e-004	0.0101	3.0000e-005	3.8100e-003	2.0000e-005	3.8300e-003	1.0100e-003	2.0000e-005	1.0300e-003	0.0000	3.1018	3.1018	7.0000e-005	0.0000	3.1034
Total	**1.3800e-003**	**9.3000e-004**	**0.0101**	**3.0000e-005**	**3.8100e-003**	**2.0000e-005**	**3.8300e-003**	**1.0100e-003**	**2.0000e-005**	**1.0300e-003**	**0.0000**	**3.1018**	**3.1018**	**7.0000e-005**	**0.0000**	**3.1034**

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	1.1200e-003	7.9100e-003	0.0167	2.0000e-005		6.0000e-004	6.0000e-004		5.5000e-004	5.5000e-004	0.0000	2.0897	2.0897	6.8000e-004	0.0000	2.1066

Total	**1.1200e-003**	**7.9100e-003**	**0.0167**	**2.0000e-005**		**6.0000e-004**	**6.0000e-004**		**5.5000e-004**	**5.5000e-004**	**0.0000**	**2.0897**	**2.0897**	**6.8000e-004**	**0.0000**	**2.1066**

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	1.3800e-003	9.3000e-004	0.0101	3.0000e-005	3.8100e-003	2.0000e-005	3.8300e-003	1.0100e-003	2.0000e-005	1.0300e-003	0.0000	3.1018	3.1018	7.0000e-005	0.0000	3.1034
Total	**1.3800e-003**	**9.3000e-004**	**0.0101**	**3.0000e-005**	**3.8100e-003**	**2.0000e-005**	**3.8300e-003**	**1.0100e-003**	**2.0000e-005**	**1.0300e-003**	**0.0000**	**3.1018**	**3.1018**	**7.0000e-005**	**0.0000**	**3.1034**

3.12 Punch List and Final Completion - 2022

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	0.0000	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**

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	2.0000e-005	6.1000e-004	1.3000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1847	0.1847	1.0000e-005	0.0000	0.1849
Vendor	8.0000e-005	2.4400e-003	6.2000e-004	1.0000e-005	1.6000e-004	1.0000e-005	1.7000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.6401	0.6401	3.0000e-005	0.0000	0.6409
Worker	3.5000e-004	2.3000e-004	2.5200e-003	1.0000e-005	9.5000e-004	1.0000e-005	9.6000e-004	2.5000e-004	1.0000e-005	2.6000e-004	0.0000	0.7755	0.7755	2.0000e-005	0.0000	0.7759
Total	**4.5000e-004**	**3.2800e-003**	**3.2700e-003**	**2.0000e-005**	**1.1500e-003**	**2.0000e-005**	**1.1700e-003**	**3.1000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**1.6003**	**1.6003**	**6.0000e-005**	**0.0000**	**1.6016**

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	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated 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	2.0000e-005	6.1000e-004	1.3000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1847	0.1847	1.0000e-005	0.0000	0.1849
Vendor	8.0000e-005	2.4400e-003	6.2000e-004	1.0000e-005	1.6000e-004	1.0000e-005	1.7000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.6401	0.6401	3.0000e-005	0.0000	0.6409
Worker	3.5000e-004	2.3000e-004	2.5200e-003	1.0000e-005	9.5000e-004	1.0000e-005	9.6000e-004	2.5000e-004	1.0000e-005	2.6000e-004	0.0000	0.7755	0.7755	2.0000e-005	0.0000	0.7759
Total	**4.5000e-004**	**3.2800e-003**	**3.2700e-003**	**2.0000e-005**	**1.1500e-003**	**2.0000e-005**	**1.1700e-003**	**3.1000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**1.6003**	**1.6003**	**6.0000e-005**	**0.0000**	**1.6016**

AMPORTS Landside Operations

Contra Costa County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	25.33	1000sqft	0.58	25,328.00	0
Other Asphalt Surfaces	0.35	Acre	0.35	15,376.68	0
Other Non-Asphalt Surfaces	7.60	Acre	17.48	331,056.00	0
Parking Lot	20.00	Acre	20.49	871,200.00	0
User Defined Commercial	35.00	User Defined Unit	0.00	0.00	0
User Defined Industrial	14.62	User Defined Unit	0.00	0.00	0
Manufacturing	1.00	1000sqft	0.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2023
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 - Project Description. User defined industrial and commerical set for operational uses.

Construction Phase - Project Specific Construction Schedule provided by applicant

Off-road Equipment - applicant provided information

Off-road Equipment - No construction equipment, operational assessment only.

Trips and VMT - No construction vehicles, operational assessment only.

Vehicle Trips - Adjusted trip rates to equal operational trip estimates

Fleet Mix - Adjusted fleet mix to reflect actual vehicle types to be used on site.

Water And Wastewater - Applicant estimate - 500 gpd x 260 days

Landscape Equipment -

Energy Use - only 25.3 ksf building

Solid Waste - only 25.3 ksf building

Table Name	Column Name	Default Value	New Value
tblEnergyUse	LightingElect	3.08	0.00
tblEnergyUse	NT24E	3.70	0.00
tblEnergyUse	NT24NG	6.67	0.00
tblEnergyUse	T24E	1.48	0.00
tblEnergyUse	T24NG	19.71	0.00
tblFleetMix	HHD	0.02	0.00
tblFleetMix	HHD	0.02	0.00
tblFleetMix	HHD	0.02	1.00
tblFleetMix	HHD	0.02	0.00
tblFleetMix	LDA	0.59	0.60
tblFleetMix	LDA	0.59	0.60
tblFleetMix	LDA	0.59	0.00
tblFleetMix	LDA	0.59	0.61
tblFleetMix	LDT1	0.04	0.04
tblFleetMix	LDT1	0.04	0.04
tblFleetMix	LDT1	0.04	0.00
tblFleetMix	LDT1	0.04	0.04
tblFleetMix	LDT2	0.19	0.20
tblFleetMix	LDT2	0.19	0.20
tblFleetMix	LDT2	0.19	0.00

tblFleetMix	LDT2	0.19	0.20
tblFleetMix	LHD1	0.02	0.01
tblFleetMix	LHD1	0.02	0.01
tblFleetMix	LHD1	0.02	0.00
tblFleetMix	LHD1	0.02	0.00
tblFleetMix	LHD2	5.0130e-003	0.01
tblFleetMix	LHD2	5.0130e-003	0.01
tblFleetMix	LHD2	5.0130e-003	0.00
tblFleetMix	LHD2	5.0130e-003	0.00
tblFleetMix	MCY	5.3510e-003	0.00
tblFleetMix	MCY	5.3510e-003	0.00
tblFleetMix	MCY	5.3510e-003	0.00
tblFleetMix	MCY	5.3510e-003	0.00
tblFleetMix	MDV	0.12	0.14
tblFleetMix	MDV	0.12	0.14
tblFleetMix	MDV	0.12	0.00
tblFleetMix	MDV	0.12	0.15
tblFleetMix	MH	8.0200e-004	0.00
tblFleetMix	MH	8.0200e-004	0.00
tblFleetMix	MH	8.0200e-004	0.00
tblFleetMix	MH	8.0200e-004	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	OBUS	1.6350e-003	0.00
tblFleetMix	OBUS	1.6350e-003	0.00
tblFleetMix	OBUS	1.6350e-003	0.00
tblFleetMix	OBUS	1.6350e-003	0.00
tblFleetMix	SBUS	2.7260e-003	0.00

tblFleetMix	SBUS	2.7260e-003	0.00
tblFleetMix	SBUS	2.7260e-003	0.00
tblFleetMix	SBUS	2.7260e-003	0.00
tblFleetMix	UBUS	1.7420e-003	0.00
tblFleetMix	UBUS	1.7420e-003	0.00
tblFleetMix	UBUS	1.7420e-003	0.00
tblFleetMix	UBUS	1.7420e-003	0.00
tblLandUse	LandUseSquareFeet	25,330.00	25,328.00
tblLandUse	LandUseSquareFeet	15,246.00	15,376.68
tblLandUse	LandUseSquareFeet	1,000.00	0.00
tblLandUse	LotAcreage	7.60	17.48
tblLandUse	LotAcreage	20.00	20.49
tblLandUse	LotAcreage	0.02	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblSolidWaste	SolidWasteGenerationRate	1,860.00	0.00
tblTripsAndVMT	WorkerTripNumber	15.00	0.00
tblVehicleTrips	CC_TL	7.30	65.00
tblVehicleTrips	CC_TL	7.30	0.00
tblVehicleTrips	CC_TTP	28.00	0.00
tblVehicleTrips	CC_TTP	0.00	100.00
tblVehicleTrips	CC_TTP	28.00	0.00
tblVehicleTrips	CNW_TL	7.30	0.00
tblVehicleTrips	CNW_TL	7.30	0.00
tblVehicleTrips	CNW_TTP	13.00	0.00
tblVehicleTrips	CNW_TTP	13.00	0.00
tblVehicleTrips	CW_TL	9.50	0.00
tblVehicleTrips	CW_TL	9.50	1.00
tblVehicleTrips	CW_TTP	59.00	100.00

tblVehicleTrips	CW_TTP	0.00	100.00
tblVehicleTrips	CW_TTP	59.00	100.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	PR_TP	0.00	100.00
tblVehicleTrips	PR_TP	0.00	100.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	1.32	0.00
tblVehicleTrips	ST_TR	1.49	0.00
tblVehicleTrips	SU_TR	0.68	0.00
tblVehicleTrips	SU_TR	0.62	0.00
tblVehicleTrips	WD_TR	6.97	2.93
tblVehicleTrips	WD_TR	0.00	0.24
tblVehicleTrips	WD_TR	0.00	14.62
tblVehicleTrips	WD_TR	3.82	144.24
tblWater	IndoorWaterUseRate	5,857,562.50	130,000.00
tblWater	IndoorWaterUseRate	346,875,000.00	0.00

2.0 Emissions Summary

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	0.2163	1.0000e-005	9.5000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.8600e-003	1.8600e-003	0.0000	0.0000	1.9800e-003
Energy	3.6000e-003	0.0328	0.0275	2.0000e-004		2.4900e-003	2.4900e-003		2.4900e-003	2.4900e-003	0.0000	185.2213	185.2213	7.4500e-003	2.0500e-003	186.0192
Mobile	0.4044	9.9021	3.8588	0.0612	1.6172	0.0261	1.6433	0.4437	0.0250	0.4686	0.0000	5,908.6841	5,908.6841	0.1858	0.0000	5,913.3279

Waste						0.0000	0.0000		0.0000	0.0000	6.3760	0.0000	6.3760	0.3768	0.0000	15.7961
Water						0.0000	0.0000		0.0000	0.0000	0.0412	0.2046	0.2459	4.2500e-003	1.0000e-004	0.3824
Total	**0.6244**	**9.9348**	**3.8873**	**0.0614**	**1.6172**	**0.0286**	**1.6458**	**0.4437**	**0.0275**	**0.4711**	**6.4172**	**6,094.1119**	**6,100.5291**	**0.5743**	**2.1500e-003**	**6,115.5276**

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	0.2163	1.0000e-005	9.5000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.8600e-003	1.8600e-003	0.0000	0.0000	1.9800e-003
Energy	3.6000e-003	0.0328	0.0275	2.0000e-004		2.4900e-003	2.4900e-003		2.4900e-003	2.4900e-003	0.0000	185.2213	185.2213	7.4500e-003	2.0500e-003	186.0192
Mobile	0.4044	9.9021	3.8588	0.0612	1.6172	0.0261	1.6433	0.4437	0.0250	0.4686	0.0000	5,908.6841	5,908.6841	0.1858	0.0000	5,913.3279
Waste						0.0000	0.0000		0.0000	0.0000	6.3760	0.0000	6.3760	0.3768	0.0000	15.7961
Water						0.0000	0.0000		0.0000	0.0000	0.0412	0.2046	0.2459	4.2500e-003	1.0000e-004	0.3824
Total	**0.6244**	**9.9348**	**3.8873**	**0.0614**	**1.6172**	**0.0286**	**1.6458**	**0.4437**	**0.0275**	**0.4711**	**6.4172**	**6,094.1119**	**6,100.5291**	**0.5743**	**2.1500e-003**	**6,115.5276**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.4044	9.9021	3.8588	0.0612	1.6172	0.0261	1.6433	0.4437	0.0250	0.4686	0.0000	5,908.6841	5,908.6841	0.1858	0.0000	5,913.3279
Unmitigated	0.4044	9.9021	3.8588	0.0612	1.6172	0.0261	1.6433	0.4437	0.0250	0.4686	0.0000	5,908.6841	5,908.6841	0.1858	0.0000	5,913.3279

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	74.22	0.00	0.00	183,316	183,316
Other Asphalt Surfaces	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
User Defined Commercial	8.40	0.00	0.00	20,748	20,748
User Defined Industrial	213.74	0.00	0.00	3,612,280	3,612,280
Manufacturing	144.24	0.00	0.00	37,502	37,502
Total	440.60	0.00	0.00	3,853,847	3,853,847

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	100.00	0.00	0.00	100	0	0
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
User Defined Commercial	9.50	7.30	7.30	100.00	0.00	0.00	100	0	0
User Defined Industrial	0.00	65.00	0.00	0.00	100.00	0.00	100	0	0
Manufacturing	1.00	0.00	0.00	100.00	0.00	0.00	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.600000	0.040000	0.200000	0.140000	0.010000	0.010000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Other Asphalt Surfaces	0.590657	0.037535	0.185105	0.118290	0.015611	0.005013	0.010768	0.024764	0.001635	0.001742	0.005351	0.002726	0.000802
Other Non-Asphalt Surfaces	0.590657	0.037535	0.185105	0.118290	0.015611	0.005013	0.010768	0.024764	0.001635	0.001742	0.005351	0.002726	0.000802
Parking Lot	0.590657	0.037535	0.185105	0.118290	0.015611	0.005013	0.010768	0.024764	0.001635	0.001742	0.005351	0.002726	0.000802
User Defined Commercial	0.600000	0.040000	0.200000	0.140000	0.010000	0.010000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
User Defined Industrial	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Manufacturing	0.610000	0.040000	0.200000	0.150000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	149.5661	149.5661	6.7600e-003	1.4000e-003	150.1522
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	149.5661	149.5661	6.7600e-003	1.4000e-003	150.1522
NaturalGas Mitigated	3.6000e-003	0.0328	0.0275	2.0000e-004		2.4900e-003	2.4900e-003		2.4900e-003	2.4900e-003	0.0000	35.6552	35.6552	6.8000e-004	6.5000e-004	35.8671
NaturalGas Unmitigated	3.6000e-003	0.0328	0.0275	2.0000e-004		2.4900e-003	2.4900e-003		2.4900e-003	2.4900e-003	0.0000	35.6552	35.6552	6.8000e-004	6.5000e-004	35.8671

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 Light Industry	668153	3.6000e-003	0.0328	0.0275	2.0000e-004		2.4900e-003	2.4900e-003		2.4900e-003	2.4900e-003	0.0000	35.6552	35.6552	6.8000e-004	6.5000e-004	35.8671
Manufacturing	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**3.6000e-003**	**0.0328**	**0.0275**	**2.0000e-004**		**2.4900e-003**	**2.4900e-003**		**2.4900e-003**	**2.4900e-003**	**0.0000**	**35.6552**	**35.6552**	**6.8000e-004**	**6.5000e-004**	**35.8671**

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 Light Industry	668153	3.6000e-003	0.0328	0.0275	2.0000e-004		2.4900e-003	2.4900e-003		2.4900e-003	2.4900e-003	0.0000	35.6552	35.6552	6.8000e-004	6.5000e-004	35.8671
Manufacturing	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**3.6000e-003**	**0.0328**	**0.0275**	**2.0000e-004**		**2.4900e-003**	**2.4900e-003**		**2.4900e-003**	**2.4900e-003**	**0.0000**	**35.6552**	**35.6552**	**6.8000e-004**	**6.5000e-004**	**35.8671**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	209209	60.8614	2.7500e-003	5.7000e-004	61.0999
Manufacturing	0	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	304920	88.7047	4.0100e-003	8.3000e-004	89.0523
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**149.5661**	**6.7600e-003**	**1.4000e-003**	**150.1522**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	209209	60.8614	2.7500e-003	5.7000e-004	61.0999
Manufacturing	0	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	304920	88.7047	4.0100e-003	8.3000e-004	89.0523
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**149.5661**	**6.7600e-003**	**1.4000e-003**	**150.1522**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.2163	1.0000e-005	9.5000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.8600e-003	1.8600e-003	0.0000	0.0000	1.9800e-003
Unmitigated	0.2163	1.0000e-005	9.5000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.8600e-003	1.8600e-003	0.0000	0.0000	1.9800e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					

Architectural Coating	0.0386					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1776					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	9.0000e-005	1.0000e-005	9.5000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.8600e-003	1.8600e-003	0.0000	0.0000	1.9800e-003
Total	**0.2163**	**1.0000e-005**	**9.5000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.8600e-003**	**1.8600e-003**	**0.0000**	**0.0000**	**1.9800e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0386					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1776					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	9.0000e-005	1.0000e-005	9.5000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.8600e-003	1.8600e-003	0.0000	0.0000	1.9800e-003
Total	**0.2163**	**1.0000e-005**	**9.5000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.8600e-003**	**1.8600e-003**	**0.0000**	**0.0000**	**1.9800e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.2459	4.2500e-003	1.0000e-004	0.3824
Unmitigated	0.2459	4.2500e-003	1.0000e-004	0.3824

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			

General Light Industry	0.13 / 0	0.2459	4.2500e-003	1.0000e-004	0.3824
Manufacturing	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
User Defined Commercial	0 / 0	0.0000	0.0000	0.0000	0.0000
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.2459**	**4.2500e-003**	**1.0000e-004**	**0.3824**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	0.13 / 0	0.2459	4.2500e-003	1.0000e-004	0.3824
Manufacturing	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
User Defined Commercial	0 / 0	0.0000	0.0000	0.0000	0.0000
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.2459**	**4.2500e-003**	**1.0000e-004**	**0.3824**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	6.3760	0.3768	0.0000	15.7961
Unmitigated	6.3760	0.3768	0.0000	15.7961

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	31.41	6.3760	0.3768	0.0000	15.7961
Manufacturing	0	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**6.3760**	**0.3768**	**0.0000**	**15.7961**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			

General Light Industry	31.41	6.3760	0.3768	0.0000	15.7961
Manufacturing	0	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**6.3760**	**0.3768**	**0.0000**	**15.7961**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

AMPORTS Project Construction Assumptions

Wharf Side - Unmitigated Project Construction

Construction Phase Phase Name	Start Date	End Date	Num Days Week	Num Days
Mobilization	2021/09/01	2021/09/01	5	1
Deck Construction - Demc	2021/09/03	2021/09/07	5	3
Pile Driving	2021/09/06	2021/11/30	5	62
Deck Construction - New I	2021/11/03	2022/02/08	5	70
Fenders, Wharf Appurten:	2021/11/30	2022/03/15	5	76
Punch List and Final Comp	2022/03/30	2022/04/12	5	10

OffRoad Equipment Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Plie Driving	Excavators	1	5	1050	0.6
Pile Driving	Excavators	1	3	300	0.6

Trips and VMT Phase Name	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip	Hauling Trip
Mobilization	10	1	2	10.8	7.3	20
Deck Construction - Demc	10	0	0	10.8	7.3	20
Pile Driving	10	0	56	10.8	7.3	20
Deck Construction - New I	10	0	3	10.8	7.3	20
Fenders, Wharf Appurten:	10	0	3	10.8	7.3	20
Punch List and Final Comp	10	1	2	10.8	7.3	20

AMPORTS Project—Energy Consumption Summary

Summary of Energy Use During Construction		Total
Construction vehicle fuel	8,322	gallons (gasoline, diesel)
Construction equipment fuel	11,512	gallons (diesel)

Summary of Energy Use During Proposed Operations		(Annually)
Operational vehicle fuel consumption	390,715	gallons (gasoline, diesel)
Operational vessel fuel use	286,623	gallons (marine distillate)
Operational vessel fuel use	6,201	gallons (residual oil)
Operational natural gas consumption	668,153	kilo-British Thermal Units
Operational electricity consumption	514,129	kilowatt hours

Construction Vehicle Fuel Calculations (Page 1 of 2)

California Air Resource Board (ARB). 2021. EMFAC2014 Web Database. Website: https://www.arb.ca.gov/emfac/2014/. Accessed March 6, 2021.

EMFAC2014 (v1.0.7) Emissions Inventory
Region Type: Sub-Area
Region: Contra Costa (SF)
Calendar Year: 2023
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for VMT, trips/day for Trips, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

VMT = Vehicle Miles Traveled
FE = Fuel Economy

Given									*Calculations*	
Region	Calendar Year	Vehicle Class	Model Year	Speed	Fuel	Population	VMT (mi/day)	Fuel Consumption (1000 gallons/day)	FE (mi/gallon)	VMT*FE
Contra Costa (SF)	2023	HHDT	Aggregated	Aggregated	GAS	37.6150949	5223.501	1.077856849	4.846191792	25314.088
Contra Costa (SF)	2023	HHDT	Aggregated	Aggregated	DSL	4418.44028	631969.32	102.0600966	6.19212934	3913235.8
Contra Costa (SF)	2023	LDA	Aggregated	Aggregated	GAS	389263.524	14156393	442.2641263	32.00891124	453130732
Contra Costa (SF)	2023	LDA	Aggregated	Aggregated	DSL	4641.43	171648.82	4.222914934	40.64699913	6977009.4
Contra Costa (SF)	2023	LDT1	Aggregated	Aggregated	GAS	27194.1328	964757.21	35.47658782	27.19419389	26235795
Contra Costa (SF)	2023	LDT1	Aggregated	Aggregated	DSL	25.4315851	631.81637	0.020013168	31.57003209	19946.463
Contra Costa (SF)	2023	LDT2	Aggregated	Aggregated	GAS	120540.327	4753181.8	195.7083872	24.28706224	115440822
Contra Costa (SF)	2023	LDT2	Aggregated	Aggregated	DSL	227.679007	9675.6236	0.304478451	31.77769597	307469.03
Contra Costa (SF)	2023	LHDT1	Aggregated	Aggregated	GAS	6346.64513	184360.37	18.95741407	9.724974684	1792899.9
Contra Costa (SF)	2023	LHDT1	Aggregated	Aggregated	DSL	6422.44681	217307.37	12.21868361	17.78484332	3864777.6
Contra Costa (SF)	2023	LHDT2	Aggregated	Aggregated	GAS	1012.94298	38305.24	4.264880431	8.981550629	344040.45
Contra Costa (SF)	2023	LHDT2	Aggregated	Aggregated	DSL	2312.94001	90669.218	5.602449883	16.18385171	1467377.2
Contra Costa (SF)	2023	MDV	Aggregated	Aggregated	GAS	84762.8948	2979648.7	168.6988176	17.66253476	52628149
Contra Costa (SF)	2023	MDV	Aggregated	Aggregated	DSL	1498.1469	64023.643	2.642165564	24.23150312	1551389.1
Contra Costa (SF)	2023	MHDT	Aggregated	Aggregated	GAS	741.84873	41032.267	6.250953667	6.564161162	269342.42
Contra Costa (SF)	2023	MHDT	Aggregated	Aggregated	DSL	4943.18308	236030.86	28.06056014	8.411480565	1985369

Worker
Weighted Average Fuel Economy 28.410928

Vendor
Weighted Average Fuel Economy 9.4555844

Haul
Weighted Average Fuel Economy 6.1810958

Construction Vehicle Fuel Calculations (Page 2 of 2)

Construction Schedule

Source: CalEEMod Output

Amports - Wharfside

CalEEMod Run	Phase Name	Start Date	End Date	Num Days Week	Num Days
Project Construction	Mobilization	2021/09/01	2021/09/01	5	1
Project Construction	Deck Construction - Demo	2021/09/03	2021/09/07	5	3
Project Construction	Pile Driving	2021/09/06	2021/11/30	5	62
Project Construction	Deck Construction - New Dec	2021/11/03	2022/02/08	5	70
Project Construction	Fenders, Wharf Appurtenanc	2021/11/30	2022/03/15	5	76
	Punch List and Final Complet	2022/03/30	2022/04/12	5	10

Construction Trips and VMT

	Trips per Day		Total Trips	Construction Trip Length in Miles				Trips per Phase			VMT per Phase			Fuel Consumption (gallons)		
Phase Name	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Number of Days per Phase	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trips	Vendor Trips	Hauling Trips	Worker Trips	Vendor Trips	Hauling Trips
Mobilization	10	1	2	10.8	7.3	20	1	10	1	2	108	7	40	3.80	0.77	6.47
Deck Construction - Demo	10	0	0	10.8	7.3	20	3	30	0	0	324	0	0	11.40	0.00	0.00
Pile Driving	10	0	56	10.8	7.3	20	62	620	0	56	6,696	0	1,120	235.68	0.00	181.20
Deck Construction - New Deck	10	0	3	10.8	7.3	20	70	700	0	3	7,560	0	60	266.09	0.00	9.71
Fenders, Wharf Appurtenances, Utilities	10	0	3	10.8	7.3	20	20	200	0	3	2,160	0	60	76.03	0.00	9.71
Punch List and Final Completion	10	1	2	10.8	7.3	20	76	760	76	2	8,208	555	40	288.90	58.67	6.47

Total Project Construction VMT (miles)
26,938

Total Project Fuel Consumption (gallons)
1,155

Construction Vehicle Fuel Calculations (Page 2 of 2)

Construction Schedule

Source: CalEEMod Output

Amports - Landside

CalEEMod Run	Phase Name	Start Date	End Date	Num Days Week	Num Days
Project Construction	Mobilization	12/16/2021	2021/12/22	5	5
Project Construction	Erosion Control	2021/12/23	2021/12/29	5	5
Project Construction	Demolition	2021/12/30	2022/01/05	5	5
Project Construction	Utilities	2022/01/06	2022/03/30	5	60
Project Construction	Construct Building Foundatio	2022/03/31	2022/06/01	5	45
Project Construction	Site Paving	2022/03/31	2022/06/22	5	60
Project Construction	Erect Light Poles	2022/03/31	2022/04/27	5	20
Project Construction	Erect Pre-Engineered Metal E	2022/06/10	2022/07/07	5	20
Project Construction	Building Interior Constructioi	2022/07/08	2022/08/04	5	20
Project Construction	Building Finishes	2022/08/05	2022/09/01	5	20
Project Construction	Punch List and Final Complet	2022/09/02	2022/09/08	5	5

Construction Trips and VMT

	Trips per Day		Total Trips	Construction Trip Length in Miles				Trips per Phase			VMT per Phase			Fuel Consumption (gallons)		
Phase Name	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Number of Days per Phase	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trips	Vendor Trips	Hauling Trips	Worker Trips	Vendor Trips	Hauling Trips
Mobilization	48	10	5	10.8	7.3	20	5	240	50	5	2,592	365	100	91.23	38.60	16.18
Erosion Control	48	10	0	10.8	7.3	20	5	240	50	0	2,592	365	0	91.23	38.60	0.00
Demolition	48	10	10	10.8	7.3	20	5	240	50	10	2,592	365	200	91.23	38.60	32.36
Utilities	48	6	30	10.8	7.3	20	60	2,880	360	30	31,104	2,628	600	1,094.79	277.93	97.07
Construct Building Foundations	48	0	108	10.8	7.3	20	45	2,160	0	108	23,328	0	2,160	821.09	0.00	349.45
Site Paving	48	0	399	10.8	7.3	20	60	2,880	0	399	31,104	0	7,980	1,094.79	0.00	1,291.03
Erect Light Poles	48	0	15	10.8	7.3	20	20	960	0	15	10,368	0	300	364.93	0.00	48.54
Erect Pre-Engineered Metal Building	48	0	15	10.8	7.3	20	20	960	0	15	10,368	0	300	364.93	0.00	48.54
Building Interior Construction	48	0	0	10.8	7.3	20	20	960	0	0	10,368	0	0	364.93	0.00	0.00
Building Finishes	48	0	0	10.8	7.3	20	20	960	0	0	10,368	0	0	364.93	0.00	0.00
Punch List and Final Completion	48	10	5	10.8	7.3	20	5	240	50	5	2,592	365	100	91.23	38.60	16.18

Total Project Construction VMT (miles)
153,204

Total Project Fuel Consumption (gallons)
7,167

Construction Equipment Fuel Calculation (Page 2 of 2)

OFFROAD2017 (v1.0.1) Emissions Inventory
Region Type: Sub-Area
Region: Contra Costa (SF)
Calendar Year: 2023
Scenario: All Adopted Rules - Exhaust
Vehicle Classification: OFFROAD2017 Equipment Types
Units: Emissions: tons/day, Fuel Consumption: gallons/year, Activity: hours/year, HP-Hours: HP-hours/year

CalYr	Vehicle Class	Model Year	HP_Bin	Fuel	Fuel (gallons/year)	Horsepower Hours (HP-hours/year)	Fuel (gallons/HP-hour)
2021	ConstMin - Cranes	Aggregated	75	Diesel	206.2177	13756.50131	0.014990567
2021	ConstMin - Excavators	Aggregated	175	Diesel	191022.9451	9666442.07565	0.019761453
2021	ConstMin - Graders	Aggregated	175	Diesel	116102.9888	5470452.23039	0.021223655
2021	ConstMin - Pavers	Aggregated	175	Diesel	25245.8603	1172690.18101	0.021528159
2021	ConstMin - Paving Equipment	Aggregated	175	Diesel	10682.9508	582991.79989	0.018324359
2021	ConstMin - Rollers	Aggregated	100	Diesel	60929.0170	3138772.52784	0.019411734
2021	ConstMin - Rough Terrain Forklifts	Aggregated	100	Diesel	156870.3441	7536664.80425	0.020814292
2021	ConstMin - Rubber Tired Dozers	Aggregated	300	Diesel	8511.9241	415570.77441	0.02048249
2021	ConstMin - Scrapers	Aggregated	300	Diesel	71097.1231	2852562.44175	0.02492395
2021	ConstMin - Tractors/Loaders/Backhoes	Aggregated	175	Diesel	163710.9151	8620823.02549	0.018990172
2021	OFF - ConstMin - Cement and Mortar Mixers	Aggregated	300	Diesel	102736.2000	5401945.43171	0.019018371
2021	OFF - ConstMin - Concrete/Industrial Saws	Aggregated	100	Diesel	13561.7178	520648.28542	0.026047753
2021	OFF - Light Commercial - Generator Sets	Aggregated	25	Diesel	2909.0500	91038.30000	0.031954134
2021	OFF - Light Commercial - Welders	Aggregated	50	Diesel	1481.9000	35291.85000	0.041989865
2021	ConstMin - Trenchers	Aggregated	50	Diesel	70926.8000	1675459.50000	0.042332745
2021	OFF - Light Commercial - Air Compressors	Aggregated	50	Diesel	118157.8000	4575442.90000	0.025824342

Construction Equipment Fuel Calculation (Page 1 of 2)

Source: CalEEMod Output
Amports - Wharf Side
Construction Schedule

Construction Area	Phase Type	Start Date	End Date	Num Days Week	Num Days
Project Construction	Mobilization	2021/09/01	2021/09/01	5	1
Project Construction	Deck Construction - Demo	2021/09/03	2021/09/07	5	3
Project Construction	Pile Driving	2021/09/06	2021/11/30	5	62
Project Construction	Deck Construction - New Deck	2021/11/03	2022/02/08	5	70
Project Construction	Fenders, Wharf Appurtenances, Utilities	2021/11/30	2022/03/15	5	76
	Punch List and Final Completion	2022/03/30	2022/04/12	5	10

Construction Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor	Number of Days	HP Hours	Fuel (gallons/HP-	Diesel Fuel Usage
Pile Driving	Excavators	1	5	1050	0.6	62	195,300.00	0.020	3,859.41
Pile Driving	Excavators	1	3	300	0.60	62	33,480.00	0.020	661.61
								Total Construction Equipment Fuel Consumption (gallons)	**4,521.03**

Notes:
Equipment assumptions are provided in the CalEEMod output files.
Source of usage estimates: California Air Resource Board (ARB). 2021. OFFROAD2017 (v1.0.1) Emissions Inventory
Website: https://www.arb.ca.gov/orion/. Accessed March 9, 2021.

Construction Equipment Fuel Calculation (Page 1 of 2)

Source: CalEEMod Output
Amports - Wharf Side
Construction Schedule

Construction Area	Phase Type	Start Date	End Date	Num Days Week	Num Days
Project Construction	Mobilization	2021/12/16	2021/12/22	5	5
Project Construction	Erosion Control	2021/12/23	2021/12/29	5	5
Project Construction	Demolition	2021/12/30	2022/01/05	5	5
Project Construction	Utilities	2022/01/06	2022/03/30	5	60
Project Construction	Construct Building Foundations	2022/03/31	2022/06/01	5	45
Project Construction	Site Paving	2022/03/31	2022/06/22	5	60
Project Construction	Erect Light Poles	2022/03/31	2022/04/27	5	20
Project Construction	Erect Pre-Engineered Metal Building	2022/06/10	2022/07/07	5	20
Project Construction	Building Interior Construction	2022/07/08	2022/08/04	5	20
Project Construction	Building Finishes	2022/08/05	2022/09/01	5	20
	Punch List and Final Completion	2022/09/02	2022/09/08	5	5

Construction Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor	Number of Days	HP Hours	Fuel (gallons/HP-	Diesel Fuel Usage
Demolition	Concrete/Industrial Saws	2	6	40	0.73	5	1,752.00	0.026	45.64
Demolition	Excavators	1	6	162	0.38	5	1,846.80	0.020	36.50
Demolition	Rubber Tired Dozers	1	6	247	0.4	4	2,371.20	0.020	48.57
Demolition	Tractors/Loaders/Backhoes	2	6	97	0.37	4	1,722.72	0.019	32.71
Utilities	Excavators	1	6	162	0.38	60	22,161.60	0.020	437.95
Utilities	Plate Compactors	1	6	8	0.43	60	1,238.40	0.018	22.69
Utilities	Rollers	1	6	80	0.38	60	10,944.00	0.019	212.44
Utilities	Tractors/Loaders/Backhoes	2	6	97	0.37	60	25,840.80	0.019	490.72
Construct Building Foundations	Excavators	1	6	162	0.38	45	16,621.20	0.020	328.46
Construct Building Foundations	Rollers	1	6	80	0.38	45	8,208.00	0.018	150.41
Construct Building Foundations	Tractors/Loaders/Backhoes	2	6	97	0.37	45	19,380.60	0.019	368.04
Site Paving	Pavers	2	6	130	0.42	60	39,312.00	0.022	846.31
Site Paving	Rollers	2	6	80	0.38	60	21,888.00	0.018	401.08
Site Paving	Surfacing Equipment	2	6	225	0.78	60	126,360.00	0.018	2,315.47
Site Paving	Tractors/Loaders/Backhoes	2	6	97	0.37	20	8,613.60	0.019	163.57
Erect Light Poles	Cranes	1	6	226	0.29	20	7,864.80	0.015	117.90
Erect Pre-Engineered Metal Building	Cranes	1	6	226	0.29	20	7,864.80	0.015	117.90
Erect Pre-Engineered Metal Building	Forklifts	2	6	89	0.2	20	4,272.00	0.021	88.92
Erect Pre-Engineered Metal Building	Generator Sets	1	6	84	0.74	20	7,459.20	0.021	158.31
Erect Pre-Engineered Metal Building	Tractors/Loaders/Backhoes	2	6	97	0.37	20	8,613.60	0.018	157.84
Erect Pre-Engineered Metal Building	Welders	3	6	46	0.45	20	7,452.00	0.042	312.91
Building Interior Construction	Forklifts	1	6	89	0.2	20	2,136.00	0.021	44.46
Building Finishes	Aerial Lifts	1	6	62	0.31	20	2,306.40	0.021	48.01
Building Finishes	Forklifts	1	6	89	0.2	20	2,136.00	0.021	44.46
							Total Construction Equipment Fuel Consumption (gallons)		**6,991.26**

Notes:
Equipment assumptions are provided in the CalEEMod output files.
Source of usage estimates: California Air Resource Board (ARB). 2021. OFFROAD2017 (v1.0.1) Emissions Inventory
Website: https://www.arb.ca.gov/orion/. Accessed March 9, 2021.

Operational Fuel Calculation—Project-generated Operational Trips (Page 1 of 2)

California Air Resource Board (ARB). 2021. EMFAC2014 Web Database. Website: https://www.arb.ca.gov/emfac/2014/. Accessed March 6, 2021.

EMFAC2014 (v1.0.7) Emissions Inventory
Region Type: Sub-Area
Region: Contra Costa (SF)
Calendar Year: 2023
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for VMT, trips/day for Trips, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

VMT = Vehicle Miles Traveled
FE = Fuel Economy

			Given						*Calculations*	
Region	Calendar Year	Vehicle Class	Model Year	Speed	Fuel	Population	VMT	Fuel Consumption	FE	VMT*FE
Contra Costa (SF)	2024	LDA	Aggregated	Aggregated	GAS	393625.1546	14205347.02	430.0842875	33.02921644	469191481.4
Contra Costa (SF)	2024	LDA	Aggregated	Aggregated	DSL	4792.34496	175962.4878	4.196646084	41.92931315	7377986.254
									Weighted Average Fuel Economy	**33.13811356**
Contra Costa (SF)	2024	LDT1	Aggregated	Aggregated	GAS	26928.77275	958636.6619	33.91320326	28.26735813	27098125.84
Contra Costa (SF)	2024	LDT1	Aggregated	Aggregated	DSL	24.60611217	620.7650713	0.018959695	32.74130033	20324.65563
Contra Costa (SF)	2024	LDT2	Aggregated	Aggregated	GAS	122058.9098	4794103.583	189.7538443	25.26485616	121122337.4
Contra Costa (SF)	2024	LDT2	Aggregated	Aggregated	DSL	238.8986269	9963.290167	0.303446977	32.83371037	327131.7837
Contra Costa (SF)	2024	MDV	Aggregated	Aggregated	GAS	84111.16323	2951928.214	161.2725139	18.30397593	54032022.98
Contra Costa (SF)	2024	MDV	Aggregated	Aggregated	DSL	1581.491785	66308.26364	2.648749731	25.03379721	1659947.626
									Weighted Average Fuel Economy	**23.26008958**
Contra Costa (SF)	2024	LHDT1	Aggregated	Aggregated	GAS	6025.808733	173705.1984	17.79303557	9.762538701	1695803.722
Contra Costa (SF)	2024	LHDT1	Aggregated	Aggregated	DSL	6359.011944	213921.0313	11.93812365	17.91915024	3833283.1
Contra Costa (SF)	2024	LHDT2	Aggregated	Aggregated	GAS	1008.173029	38122.20741	4.220619404	9.032372683	344333.9849
Contra Costa (SF)	2024	LHDT2	Aggregated	Aggregated	DSL	2336.905436	91089.22171	5.581350423	16.32028359	1486601.93
Contra Costa (SF)	2024	MHDT	Aggregated	Aggregated	GAS	759.2136247	42082.28319	6.381863907	6.594042713	277492.3728
Contra Costa (SF)	2024	MHDT	Aggregated	Aggregated	DSL	5138.436094	237804.2715	28.19859594	8.433195468	2005449.905
Contra Costa (SF)	2024	HHDT	Aggregated	Aggregated	GAS	38.91827493	5427.614385	1.111616064	4.882633995	26501.05451
Contra Costa (SF)	2024	HHDT	Aggregated	Aggregated	DSL	4571.338357	644239.859	103.4479001	6.227674593	4012116.201
									Weighted Average Fuel Economy	**9.459112904**
Contra Costa (SF)	2024	MCY	Aggregated	Aggregated	GAS	18331.52239	137738.8613	3.73511025	36.87678598	5079366.508
									Weighted Average Fuel Economy	**36.87678598**
Contra Costa (SF)	2024	MH	Aggregated	Aggregated	GAS	1823.569806	15460.96399	2.301153573	6.718788425	103878.9459
Contra Costa (SF)	2024	MH	Aggregated	Aggregated	DSL	531.8204632	4581.013111	0.4716322	9.713105066	44495.86166
Contra Costa (SF)	2024	OBUS	Aggregated	Aggregated	GAS	432.0997018	24797.25226	3.705461456	6.692082094	165945.2478
Contra Costa (SF)	2024	OBUS	Aggregated	Aggregated	DSL	223.9196894	17808.26458	2.408849532	7.392850549	131653.8386
Contra Costa (SF)	2024	SBUS	Aggregated	Aggregated	GAS	99.30917763	4882.288382	0.407881599	11.96986672	58440.34121
Contra Costa (SF)	2024	SBUS	Aggregated	Aggregated	DSL	1734.517915	65665.27027	9.003692702	7.29314876	478906.5844
Contra Costa (SF)	2024	UBUS	Aggregated	Aggregated	GAS	151.4328428	22095.33075	4.401038074	5.020481618	110929.2019
Contra Costa (SF)	2024	UBUS	Aggregated	Aggregated	DSL	152.4722179	22246.98436	4.916857659	4.524634616	100659.4755
									Weighted Average Fuel Economy	**6.730467577**

Operational Fuel Calculation—Project-generated Operational Trips (Page 2 of 2)

Total Operational VMT

AMPORTS - Passenger Vehicles

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	74.22	0.00	0.00	183,316	183,316
Other Asphalt Surfaces	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
User Defined Commercial	8.40	0.00	0.00	20,748	20,748
User Defined Industrial	213.74	0.00	0.00	3,612,280	3,612,280
Manufacturing	144.24	0.00	0.00	37,502	37,502
Total	440.60	0.00	0.00	3,853,847	3,853,847

	Annual VMT (miles)
Total VMT	**241,566**

By Vehicle Type

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.600000	0.040000	0.200000	0.140000	0.010000	0.010000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

	Fraction of 1	Percent of Vehicle Trips	Annual VMT	Daily VMT	Average Fuel Economy (miles/gallon)	Total Daily Fuel Consumption (gallons)	Total Annual Fuel Consumption (gallons)
Passenger Cars (LDA)	0.6000	60.0	144,940	397	33.14	12.0	4,374
Light Trucks and Medium Vehicles (LDT1, LDT2, and MDV)	0.3800	38.0	91,795	251	23.26	10.8	3,946
Light-Heavy to Heavy-Heavy Diesel Trucks	0.0200	2.0	4,831	13	9.46	1.4	511
Motorcycles	0.0000	0.0	0	0	36.88	0.0	0
Other	0.0000	0.0	0	0	6.73	0.0	0
Total	**—**	**100**	**241,566**	**662**	**—**	**—**	**8,831**

Operational Fuel Calculation—Project-generated Operational Trips (Page 2 of 2)

Total Operational VMT

AMPORTS - Passenger Vehicles

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	74.22	0.00	0.00	183,316	183,316
Other Asphalt Surfaces	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
User Defined Commercial	8.40	0.00	0.00	20,748	20,748
User Defined Industrial	213.74	0.00	0.00	3,612,280	3,612,280
Manufacturing	144.24	0.00	0.00	37,502	37,502
Total	440.60	0.00	0.00	3,853,847	3,853,847

	Annual VMT (miles)
Total VMT	**3,612,280**

By Vehicle Type

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000

	Fraction of 1	Percent of Vehicle Trips	Annual VMT	Daily VMT	Average Fuel Economy (miles/gallon)	Total Daily Fuel Consumption (gallons)	Total Annual Fuel Consumption (gallons)
Passenger Cars (LDA)	0.0000	0.0	0	0	33.14	0.0	0
Light Trucks and Medium Vehicles (LDT1, LDT2, and MDV)	0.0000	0.0	0	0	23.26	0.0	0
Light-Heavy to Heavy-Heavy Diesel Trucks	1.0000	100.0	3,612,280	9,897	9.46	1046.3	381,884
Motorcycles	0.0000	0.0	0	0	36.88	0.0	0
Other	0.0000	0.0	0	0	6.73	0.0	0
Total	**—**	**100**	**3,612,280**	**9,897**	**—**	**—**	**381,884**

Project Operations Natural Gas Use
Source: CalEEMod Output
Amports

kBTU/yr = kilo-British Thermal Units/year

	Natural Gas Use (kBTU/yr)	
General Light Industry	668,153	
Total	**668,153**	**kBTU/yr**

Project Operations Electricity Use

Source: CalEEMod Output

Amports

kWh/yr = kilowatt hours per year

	Electricity Use (kWh/yr)	
General Light Industry	209,209	
Parking Lot	304,920	
Total	**514,129**	**kWh/yr**

Marine Vessels

grams to g 0.000264

Table II-10 Fuel Consumption Rates (g/kW-hr)

Engine	Engine Speed	Mode	Fuel	Fuel Use Rate
Auxiliary	All	All	Marine Distillate	217
	All	All	Residual	227
Boiler	N. A.	All	Residual	305
Main	High	Transit	Residual	213
	Medium	Transit	Marine Distillate	203
	Slow	Transit	Marine Distillate	185
	Medium	Transit	Residual	213
	Slow	Transit	Residual	195
	High	Maneuvering	Residual	213
	Medium	Maneuvering	Marine Distillate	203
	Slow	Maneuvering	Marine Distillate	185
	Medium	Maneuvering	Residual	213
	Slow	Maneuvering	Residual	195

Average Vessel Characteristics (CARB 2011)

Vessel Type	Speed	Main Power	Auxiliary Power	Boiler Power
	(knots)	(kilowatts)		
Auto	19	11,593	2,999	278

# of vessels 25

Auto Carriers - Main Engines

Mode	Nautical Miles	Vessel Speed knots	Inbound Hours	Outbound Hours	Total Time in Mode	Total kW-hrs	g/kW-hr	Total Gallons
Transit	60	12	5.00	5.00	10.00	2898250	203	155424.2
Transit - low speed	2	7	0.29	0.29	0.57	165614.3	185	8093.872
Maneuveri	1	7	0.14	0.14	0.29	82807.14	185	4046.936
Hoteling	N/A	N/A	6.50		8.50	2463513		
Total								167,565

Auto Carriers - Auxiallry Engines

Mode	Nautical Miles	Vessel Speed knots	Inbound Hours	Outbound Hours	Total Time in Mode	Total kW-hrs	g/kW-hr	Total Gallons
Transit	60	12	5.00	5.00	10.00	749750	217	42979.66
Transit - low speed	2	7	0.29	0.29	0.57	42842.86	217	2455.981
Maneuveri	1	7	0.14	0.14	0.29	21421.43	217	1227.99
Hoteling	N/A	N/A	6.50		8.50	637287.5		
Total								46,664

Auto Carriers - Boilers

Mode	Nautical Miles	Vessel Speed knots	Inbound Hours	Outbound Hours	Total Time in Mode	Total kW-hrs	g/kW-hr	Total Gallons
Transit	0	0	0.00	0.00	0.00	0	0	0
Transit - low speed	0	0	0	0	0	0	0	0
Maneuveri	0	0	0	0	0	0	0	0
Hoteling	N/A	N/A	0.00		8.50	59075	305	4759.818
Total								4,760

Total Fuel Use Auto Carriers **218,988**

Marine Vessels

Table II-10 Fuel Consumption Rates (g/kW-hr)

Engine	Engine Speed	Mode	Fuel	Fuel Use Rate
Auxiliary	All	All	Marine Distillate	217
	All	All	Residual	227
Boiler	N. A.	All	Residual	305
Main	High	Transit	Residual	213
	Medium	Transit	Marine Distillate	203
	Slow	Transit	Marine Distillate	185
	Medium	Transit	Residual	213
	Slow	Transit	Residual	195
	High	Maneuvering	Residual	213
	Medium	Maneuvering	Marine Distillate	203
	Slow	Maneuvering	Marine Distillate	185
	Medium	Maneuvering	Residual	213
	Slow	Maneuvering	Residual	195

Vessel	QTY	HP	Load Factor	Total Assists	Hours Inbound	Hours Outbound	Total Hours in Transit	Total Hours in Transit Per Year	Hours at Berth	Total Hours at Berth Per Year
Tug Boats	2	4344	0.31	25	5.5	5.5	11	275	0	0
Tug Boiler	2	128	0.43	25	0	0	0	0	6.5	162.5

grams to g 0.000264

Tug and Barge Main Engine Fuel Use

Source	QTY	HP	LF	Hours of Use	g/kW-hr	Gallons
Tugs	2	4344	0.31	275	185	36197.01

Tug and Barge Auxiliary Engine Fuel Use

Source	QTY	HP	LF	Hours of Use	g/kW-hr	Gallons
Tugs	2	4344	0.31	275	185	36197.01

Tug and Barge Boiler Fuel Use

Source	QTY	HP	LF	Hours of Use	g/kW-hr	Gallons
Tugs	2	128	0.43	162.5	305	1441.28

Total 73,835

Stantec

Memo

To:	Zoe Meridith City of Antioch	From:	Elena Nuno Walnut Creek
File:	185705365	Date:	June 17, 2021

Reference: AMPORTS Antioch Auto Processing Facility – Sewer Line Installation

After completion of the air quality modeling for the proposed AMPORTS Antioch Auto Processing Facility Project (Project) it was determined that there was not an existing sewer line within Wilbur Avenue that the Project would be able to tie into and a new line would need to be extended from the site frontage to Viera. This memo provides the additional air quality modeling to account for this project component.

The new sewer line would be approximately 0.3 miles in length or 1,584 feet. A 20 foot area of disturbance was assumed to allow for excavation and installation of the new sewer line. It was assumed that any excavated soil would be balanced on-site or compacted into the sewer trench. The sewer line was assumed to progress construction at an estimated 100 linear feet per day based on experience with similar utility line installations for a total of 15.84 days; the total construction period was rounded up to 20 days to provide a conservative estimate.

Table 1 provides a summary of the offroad construction equipment for the sewer line installation. Up to 10 construction workers would be on-site for the duration of the installation. Table 2 provides a summary of the emissions estimate.

Table 1: Construction Equipment and Average Activity

Phase	Equipment Type	CalEEMod Equivalent	Horsepower	Hours per 100 feet	Total Project Hours
Grading	Grader	Grader	187	1.6	32
	Backhoe	Tractor/Loader/Backhoe	97	2.7	54
Trenching	Excavator	Excavator	158	2.7	54
	Loaders (2)	Tractor/Loader/Backhoe	108	5.3	106
	Water Truck	Water Truck	402	2.7	54
Paving	Grinder	Crushing/Processing Equipment	85	1	20
	Paver	Paver	130	1.6	32
	Roller (2)	Roller	80	3.3	66
	Compactor	Plate Compactor	8	2.7	54

Reference: **AMPORTS Antioch Auto Processing Facility – Sewer Line Installation**

Table 2: Estimated Construction Emissions – Sewer Line Installation

Year	ROG	NO_X	PM10 Exhaust	PM2.5 Exhaust	MTCO2e
2022	0.0094	0.0818	0.00391	0.00362	16.79

The revised emissions for the construction of the project are shown in Table 3.

Table 3: Construction Emissions – Wharfside, Landside, and Sewer Pipeline Construction

Year	ROG	NO_X	PM10 Exhaust	PM2.5 Exhaust	$MTCO_2e$
2021	0.25	1.67	0.06	0.05	104.08
2022	0.36	2.64	0.10	0.10	340.45
Total Tons	0.60	4.32	0.16	0.15	444.52
Total Pounds	1202.98	8633.05	315.96	303.96	N/A
Average Daily Construction Emissions in Pounds	5.73	41.11	1.50	1.45	N/A
BAAQMD Threshold of Significance (average pounds/day)	54	54	82	54	N/A
Significant?	No	No	No	No	N/A

Attachment: CalEEMod Results

AMPORTS - Sewer Line Installation

Contra Costa County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	0.75	User Defined Unit	0.75	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2023
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 - Sewer Line Installation is .75 acres

Construction Phase - 100 linear feet per day

Off-road Equipment - estimated hours based on 100 linear feet of construction per day

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	100.00	20.00
tblConstructionPhase	NumDays	5.00	20.00
tblConstructionPhase	NumDays	2.00	20.00
tblConstructionPhase	PhaseEndDate	6/13/2022	3/2/2022

tblConstructionPhase	PhaseEndDate	6/20/2022	3/30/2022
tblConstructionPhase	PhaseEndDate	1/20/2022	2/2/2022
tblConstructionPhase	PhaseStartDate	1/25/2022	2/3/2022
tblConstructionPhase	PhaseStartDate	6/14/2022	3/3/2022
tblConstructionPhase	PhaseStartDate	1/20/2022	1/6/2022
tblLandUse	LotAcreage	0.00	0.75

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					
2022	9.4200e-003	0.0818	0.0965	1.9000e-004	0.0181	3.9100e-003	0.0220	9.0800e-003	3.6200e-003	0.0127	0.0000	16.6792	16.6792	4.5900e-003	0.0000	16.7939
Maximum	**9.4200e-003**	**0.0818**	**0.0965**	**1.9000e-004**	**0.0181**	**3.9100e-003**	**0.0220**	**9.0800e-003**	**3.6200e-003**	**0.0127**	**0.0000**	**16.6792**	**16.6792**	**4.5900e-003**	**0.0000**	**16.7939**

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					
2022	9.4200e-003	0.0818	0.0965	1.9000e-004	0.0181	3.9100e-003	0.0220	9.0800e-003	3.6200e-003	0.0127	0.0000	16.6792	16.6792	4.5900e-003	0.0000	16.7939
Maximum	**9.4200e-003**	**0.0818**	**0.0965**	**1.9000e-004**	**0.0181**	**3.9100e-003**	**0.0220**	**9.0800e-003**	**3.6200e-003**	**0.0127**	**0.0000**	**16.6792**	**16.6792**	**4.5900e-003**	**0.0000**	**16.7939**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	1/6/2022	2/2/2022	5	20	
2	Trenching	Building Construction	2/3/2022	3/2/2022	5	20	
3	Paving	Paving	3/3/2022	3/30/2022	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Trenching	Tractors/Loaders/Backhoes	2	5.30	97	0.37
Trenching	Excavators	1	2.70	158	0.38
Paving	Plate Compactors	1	2.70	8	0.43
Grading	Graders	1	1.60	187	0.41
Paving	Pavers	1	1.60	130	0.42
Paving	Rollers	2	3.30	80	0.38
Paving	Crushing/Proc. Equipment	1	1.00	85	0.78
Grading	Tractors/Loaders/Backhoes	1	2.70	97	0.37
Trenching	Off-Highway Trucks	1	2.70	402	0.38

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	4	10.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	8	10.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	10	10.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Grading - 2022

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					0.0151	0.0000	0.0151	8.2800e-003	0.0000	8.2800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.3900e-003	0.0162	0.0110	2.0000e-005		6.4000e-004	6.4000e-004		5.9000e-004	5.9000e-004	0.0000	2.0858	2.0858	6.7000e-004	0.0000	2.1027
Total	**1.3900e-003**	**0.0162**	**0.0110**	**2.0000e-005**	**0.0151**	**6.4000e-004**	**0.0157**	**8.2800e-003**	**5.9000e-004**	**8.8700e-003**	**0.0000**	**2.0858**	**2.0858**	**6.7000e-004**	**0.0000**	**2.1027**

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	2.9000e-004	1.9000e-004	2.1000e-003	1.0000e-005	1.4800e-003	1.0000e-005	1.4800e-003	3.8000e-004	0.0000	3.8000e-004	0.0000	0.6462	0.6462	1.0000e-005	0.0000	0.6466
Total	**2.9000e-004**	**1.9000e-004**	**2.1000e-003**	**1.0000e-005**	**1.4800e-003**	**1.0000e-005**	**1.4800e-003**	**3.8000e-004**	**0.0000**	**3.8000e-004**	**0.0000**	**0.6462**	**0.6462**	**1.0000e-005**	**0.0000**	**0.6466**

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					0.0151	0.0000	0.0151	8.2800e-003	0.0000	8.2800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.3900e-003	0.0162	0.0110	2.0000e-005		6.4000e-004	6.4000e-004		5.9000e-004	5.9000e-004	0.0000	2.0858	2.0858	6.7000e-004	0.0000	2.1027
Total	**1.3900e-003**	**0.0162**	**0.0110**	**2.0000e-005**	**0.0151**	**6.4000e-004**	**0.0157**	**8.2800e-003**	**5.9000e-004**	**8.8700e-003**	**0.0000**	**2.0858**	**2.0858**	**6.7000e-004**	**0.0000**	**2.1027**

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	2.9000e-004	1.9000e-004	2.1000e-003	1.0000e-005	1.4800e-003	1.0000e-005	1.4800e-003	3.8000e-004	0.0000	3.8000e-004	0.0000	0.6462	0.6462	1.0000e-005	0.0000	0.6466
Total	**2.9000e-004**	**1.9000e-004**	**2.1000e-003**	**1.0000e-005**	**1.4800e-003**	**1.0000e-005**	**1.4800e-003**	**3.8000e-004**	**0.0000**	**3.8000e-004**	**0.0000**	**0.6462**	**0.6462**	**1.0000e-005**	**0.0000**	**0.6466**

3.3 Trenching - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.6500e-003	0.0418	0.0520	1.0000e-004		1.9800e-003	1.9800e-003		1.8200e-003	1.8200e-003	0.0000	9.0678	9.0678	2.9300e-003	0.0000	9.1411
Total	**4.6500e-003**	**0.0418**	**0.0520**	**1.0000e-004**		**1.9800e-003**	**1.9800e-003**		**1.8200e-003**	**1.8200e-003**	**0.0000**	**9.0678**	**9.0678**	**2.9300e-003**	**0.0000**	**9.1411**

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	2.9000e-004	1.9000e-004	2.1000e-003	1.0000e-005	7.9000e-004	1.0000e-005	8.0000e-004	2.1000e-004	0.0000	2.2000e-004	0.0000	0.6462	0.6462	1.0000e-005	0.0000	0.6466
Total	**2.9000e-004**	**1.9000e-004**	**2.1000e-003**	**1.0000e-005**	**7.9000e-004**	**1.0000e-005**	**8.0000e-004**	**2.1000e-004**	**0.0000**	**2.2000e-004**	**0.0000**	**0.6462**	**0.6462**	**1.0000e-005**	**0.0000**	**0.6466**

Mitigated Construction On-Site

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

Category	tons/yr									MT/yr					
Off-Road	4.6500e-003	0.0418	0.0520	1.0000e-004		1.9800e-003	1.9800e-003		1.8200e-003	1.8200e-003	0.0000	9.0678	9.0678	2.9300e-003	0.0000	9.1411
Total	**4.6500e-003**	**0.0418**	**0.0520**	**1.0000e-004**		**1.9800e-003**	**1.9800e-003**		**1.8200e-003**	**1.8200e-003**	**0.0000**	**9.0678**	**9.0678**	**2.9300e-003**	**0.0000**	**9.1411**

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	2.9000e-004	1.9000e-004	2.1000e-003	1.0000e-005	7.9000e-004	1.0000e-005	8.0000e-004	2.1000e-004	0.0000	2.2000e-004	0.0000	0.6462	0.6462	1.0000e-005	0.0000	0.6466
Total	**2.9000e-004**	**1.9000e-004**	**2.1000e-003**	**1.0000e-005**	**7.9000e-004**	**1.0000e-005**	**8.0000e-004**	**2.1000e-004**	**0.0000**	**2.2000e-004**	**0.0000**	**0.6462**	**0.6462**	**1.0000e-005**	**0.0000**	**0.6466**

3.4 Paving - 2022

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	2.5200e-003	0.0233	0.0272	4.0000e-005		1.2800e-003	1.2800e-003		1.2000e-003	1.2000e-003	0.0000	3.5869	3.5869	9.4000e-004	0.0000	3.6105
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Total	**2.5200e-003**	**0.0233**	**0.0272**	**4.0000e-005**		**1.2800e-003**	**1.2800e-003**		**1.2000e-003**	**1.2000e-003**	**0.0000**	**3.5869**	**3.5869**	**9.4000e-004**	**0.0000**	**3.6105**

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	2.9000e-004	1.9000e-004	2.1000e-003	1.0000e-005	7.9000e-004	1.0000e-005	8.0000e-004	2.1000e-004	0.0000	2.2000e-004	0.0000	0.6462	0.6462	1.0000e-005	0.0000	0.6466
Total	**2.9000e-004**	**1.9000e-004**	**2.1000e-003**	**1.0000e-005**	**7.9000e-004**	**1.0000e-005**	**8.0000e-004**	**2.1000e-004**	**0.0000**	**2.2000e-004**	**0.0000**	**0.6462**	**0.6462**	**1.0000e-005**	**0.0000**	**0.6466**

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	2.5200e-003	0.0233	0.0272	4.0000e-005		1.2800e-003	1.2800e-003		1.2000e-003	1.2000e-003	0.0000	3.5869	3.5869	9.4000e-004	0.0000	3.6105
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.5200e-003**	**0.0233**	**0.0272**	**4.0000e-005**		**1.2800e-003**	**1.2800e-003**		**1.2000e-003**	**1.2000e-003**	**0.0000**	**3.5869**	**3.5869**	**9.4000e-004**	**0.0000**	**3.6105**

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	2.9000e-004	1.9000e-004	2.1000e-003	1.0000e-005	7.9000e-004	1.0000e-005	8.0000e-004	2.1000e-004	0.0000	2.2000e-004	0.0000	0.6462	0.6462	1.0000e-005	0.0000	0.6466
Total	**2.9000e-004**	**1.9000e-004**	**2.1000e-003**	**1.0000e-005**	**7.9000e-004**	**1.0000e-005**	**8.0000e-004**	**2.1000e-004**	**0.0000**	**2.2000e-004**	**0.0000**	**0.6462**	**0.6462**	**1.0000e-005**	**0.0000**	**0.6466**

APPENDIX B1

AMPORTS Antioch Vehicle Processing Facility Project

Biological Constraints Analysis

May 2021

Prepared for:

City of Antioch
Planning Division
200 H Street
Antioch, CA 94509

Prepared by:

Stantec Consulting Services Inc.
1340 Treat Boulevard, Suite 300
Walnut Creek, CA 94597

Table of Contents

LIST OF APPENDICES

1.0 INTRODUCTION

This Biological Constraints Analysis (BCA) has been prepared to evaluate the potential effects on sensitive biological resources associated with the proposed AMPORTS Antioch Vehicle Processing Facility Project (Project). The Project includes the proposed development of an automotive logistics and processing facility in the City of Antioch, California on property located at 2301 Wilbur Avenue. The approximate center of the Project is located at GPS coordinate; 38° 0'50.10"N, 121°46'33.67"W.

This BCA is based on information gathered from a review of desktop resources including existing literature, data, and maps; and from a reconnaissance-level field survey of the Project area performed by Stantec Consulting Services Inc. (Stantec) biologists. The survey area for this BCA encompasses approximately 38.9 acres and consists of all proposed Project components.

The overall purpose of this BCA is to:

- Characterize the habitats and vegetation communities present;
- Evaluate the potential for special-status plant and animal species to occur;
- Provide recommended mitigation measures for inclusion into the California Environmental Quality Act (CEQA) initial study.
- Determine potential permits required for impacts to biological resources within the Project area.

2.0 PROJECT DESCRIPTION

The proposed Project involves the development of an automotive logistics and processing facility on 38.9 acres in Antioch, California. The site will be used for delivery and storage of vehicles and limited processing prior to distributions to dealerships. The improved site will include conversion and upgrade of the existing wharf to support roll-on/roll-off (RORO) operations, a one-story vehicle processing building with offices, as well as grading, fencing, paving, and striping for car storage and loading prior to distribution. The Project also includes select demolition of existing raised slabs and out of service utilities, new utility connections and on-site stormwater improvements.

3.0 METHODS

The analysis presented in this BCA includes a review of existing information about sensitive biological resources known to occur in the vicinity of the proposed Project as well as the reconnaissance-level field survey conducted to determine whether the biological resources are absent, present, and/or are likely to be present.

3.1 DEFINITIONS

3.1.1 Special-Status Species and Sensitive Communities

For the purpose of this evaluation, “special-status” plant species include plants that are: 1) listed as threatened or endangered under the California Endangered Species Act (CESA) and/or Federal Endangered Species Act (FESA); 2) proposed for federal listing as threatened or endangered; 3) State or federal candidate species; 4) designated as rare by the California Department of Fish and Wildlife (CDFW); or 5) California Rare Plant Rank (CRPR) 1A, 1B, 2A or 2B species. Special-status animal species include species that are: 1) listed as threatened or endangered under the CESA and/or FESA; 2) proposed for federal listing as threatened or endangered; 3) State and/or federal candidate species; or 4) identified by the CDFW as species of special concern or fully protected species.

Sensitive natural communities are those communities that are of highly limited in distribution, and may or may not contain rare, threatened, or endangered species. The California Natural Diversity Database (CNDDB) ranks natural communities according to their rarity and endangerment in California. Habitats are considered “sensitive” if they are identified on the CDFW List of Vegetation Alliances and Associations as being highly imperiled – Ranks S1 to S3 or classified by CDFW in the CNDDB as rare natural communities.

3.1.2 Potential to Occur

The potential for special-status species to occur within the Project area, was classified under one of five categories as described below. Only those special-status species with an occurrence potential of “Moderate” or greater are evaluated in detail.

- **Present:** The species is known to be present or has been recently observed in the survey area.
- **High:** The species has been observed and documented within five miles of the survey area within the last five years and suitable habitat for the species is present.
- **Moderate:** The proposed Project is located within the range of the species, there are documented occurrences within five miles of the survey area, and/or suitable habitat for the species exists in the survey area.
- **Low:** The proposed Project is located within the range of the species and low-quality (e.g., disturbed, agricultural) habitat is present.
- **Absent:** The proposed Project area is located outside of the species range and/or potential habitat to support the species is not present in the survey area.

3.2 LITERATURE AND DATABASE REVIEW

Information about habitat types and special-status species that could occur in the Project area was obtained from the following sources:

- CDFW CNDDB plant and animal records (CDFW 2021a) (Appendix B);
- California Native Plant Society (CNPS) online *Inventory of Rare and Endangered Plants* (CNPS 2021a) (Appendix B);
- Calflora (2021);
- United States Fish and Wildlife Service (USFWS) list of endangered and threatened species that may occur in the survey area (USFWS 2021a) (Appendix B);
- USFWS Designated Critical Habitat within the survey area (USFWS 2021a); and
- National Marine Fisheries Service (NMFS) – West Coast Region Endangered Species Act Species List (NMFS 2016) (Appendix B).

The Project area is within the *Antioch North* U.S. Geological Survey (USGS) 7.5-minute quadrangle. A CNDDB and CNPS database search for special-status species included the USGS 7.5-minute quadrangles within a 5-mile radius of the Project site. In this case, the *Antioch North*, *Antioch South*, *Jersey Island*, and *Brentwood* topographic quadrangles were queried. A 5-mile radius quadrangle search was conducted based on habitat types and migration distances for potential special-status species that could occur within the Project area. The USFWS and NMFS databases of endangered species was also utilized to query all federally endangered, threatened, candidate, and proposed animal and plant species, as well as designated critical habitat with known occurrences in this and adjacent quadrangles. Calfora and CNPS' Online Inventory databases were used to obtain more information on the habitat requirements of rare plants.

Other information sources consulted to determine which special-status species could potentially occur in the Project area included:

- USGS California 7.5-minute topographic quadrangles for *Antioch North*, *Antioch South*, *Jersey Island*, and *Brentwood*;
- Aerial photographs of the survey area and surrounding vicinity (Google Earth 2021);
- USFWS National Wetlands Inventory (USFWS 2021b);
- *Special Animals List* (CDFW 2021b);
- *State and Federally Listed Endangered and Threatened Animals of California* (CDFW 2021c);
- *State and Federally Listed Endangered, Threatened and Rare Plants of California* (CDFW 2021d);
- *Special Vascular Plants, Bryophytes, and Lichens List* (CDFW 2021e);
- California Wildlife Habitat Relationships System (WHRS) (CDFW 2014);

- University of California Agriculture and Natural Resources (UC ANR) California Fish Website (UC ANR 2021); and
- Other pertinent databases and literature, including *The Jepson Manual: Vascular Plants of California*, *Second Edition* (Baldwin et. al. 2012).

Based on this background research, a list of special-status species that have the potential to occur or are known to occur in the Project area and vicinity was developed. The list was refined based on a reconnaissance-level biological field survey to determine the potential for those species to occur in the Project area.

3.3 FIELD SURVEYS CONDUCTED

A reconnaissance-level biological survey was conducted by Stantec Biologists Jared Elia and Scott Elder on March 23, 2021. The reconnaissance-level survey was performed by walking meandering transects throughout the entire Project area to characterize habitats, identify aquatic resources that may be subject to regulatory agency jurisdiction (e.g., United States Army Corps of Engineers [USACE], Regional Water Quality Control Board (RWQCB) and CDFW), assess potential for special-status species to occur, and to record observed species. To better focus the field survey efforts on those plant and animal special-status species that may occur in the project area, a target list of potentially occurring species was developed during the literature and database review process. Plant taxonomy for the botanical survey was determined using the Jepson Manual (Baldwin et al. 2012).

4.0 ENVIRONMENTAL SETTING

4.1 SITE CONDITIONS AND LAND USE

4.1.1 Local Setting and Existing Land Use

The Project site is on a vacant parcel located in the City of Antioch. The site was the previous location of the Gaylord Paper Mill and is located on APN 051-020-006 and APN 051-020-012. The Project site is surrounded by AMPORTS vehicle storage lot to the east, industrial property to the west, San Joaquin River to the north, and Wilbur Avenue to the south. See Appendix A, Figure 1 and 2 for the Project regional overview and Project location.

4.1.2 Physical Conditions

The Project is primarily covered by a large concrete pad where the existing paper mill was located. On the west side of the Project area, a small strip of grassland occurs with minimal trees. There are no natural drainages on the property. The topography of the Project area is mostly flat with a moderate rise from the lower concrete pad adjacent to the San Joaquin River to the southern, larger concrete pad. Elevations on the Project site range from 0 feet above sea level at the north end along the San Joaquin River to 31 feet above sea level at the southern end, adjacent to Wilbur Avenue. Regionally, the Project area has a Mediterranean climate characterized by hot, dry summers and moderate winters, with average temperatures ranging seasonally from 73.3 to 48.0 degrees Fahrenheit (°F). Historical data used to describe the climate was collected at the Antioch Pump Plant 3, California (ID 040232) National Oceanic and Atmospheric Administration (NOAA) Coop Station, approximately 2.6 miles southeast of the Project area (Western Regional Climate Center 2021). Precipitation in the Project area occurs as rain. Average annual rainfall is 13.22 inches and occurs primarily from October through May. The growing season (i.e., 50 percent probability of air temperature 32ºF or higher) in the survey area is around 289 days and occurs between early February and November (Natural Resources Conservation Service. 2021).

4.2 BIOTIC HABITATS

4.2.1 Vegetation Communities

Vegetation types in the Project area were classified based on descriptions provided in *A Guide to Wildlife Habitats of California* (Mayer and Laudenslayer 1988), as well as the *California Natural Community List* (CDFW 2021f), which is adapted from the technical approach and vegetation alliance classification system described in *A Manual of California Vegetation* (Sawyer et al. 2009). The vegetation communities present in the Project area are primarily urban, with minor areas consisting of annual grassland. Aquatic vegetation communities within the Project area consist of Estuarine. Descriptions of the vegetation communities within the Project area are provided below.

Upland Habitat Types

Annual Grassland

Annual grassland habitat occurs primarily along the western limits of the Project area, with minor sections of annual grassland located on the east and west ends of the slope between the two concrete pads. This habitat is characterized as a moderate herbaceous layer and a limited overstory canopy. Dominant plant species within the annual grassland habitat includes California man-root (*Marah fabacea*), soft chess (*Bromus hordeaceus*), and ripgut brome (*Bromus diandrus*). No small mammal burrows were observed within the grassland habitat.

Urban

This land use type does not describe any specific vegetation type under Sawyer et al. (2009) but encompasses land that has been anthropogenically modified with structures and facilities, including roads and buildings. Ornamental plantings and ruderal vegetation may be present within and/or on the margins of developed areas. A majority of the Project area is urban habitat consisting of two large concrete pads with ruderal vegetation growing sporadically throughout including sweet fennel (*Foeniculum vulgare*) and telegraph weed (*Heterotheca grandiflora*). In the northwest corner of the Project area there is an old concrete stormwater detention basin that is hydraulically connected to the San Joaquin River. During the reconnaissance survey, water was observed within this basin along with minimal vegetation and algae.

Aquatic Habitat Types

Estuarine

Estuarine habitats are diverse coastal waterbodies containing a mixture of seawater and freshwater. Estuarine habitat occurs within the San Joaquin River that flows through the northern portion of the Project area. The USFWS National Wetlands Inventory mapped this section of the San Joaquin River as estuarine due to tidal influence from Suisun bay and saltwater intrusion during the summer and fall months when freshwater influx is low. The shoreline is lined with rock slope protection (RSP) with minimal vegetation growing on top, including a patch of Himalayan blackberry (*Rubus armeniacus*). During the reconnaissance survey, no vegetation was observed on the water surface.

4.2.2 Habitat Connectivity

Habitat corridors are segments of land that provide linkages for wildlife movement between different habitats while also providing cover. Corridors also function as avenues along which plants can propagate, genetic interchange can occur, populations can move in response to environmental changes and natural disasters, and populations can be replenished from other areas. Habitat corridors often consist of riparian areas along streams, rivers, or other natural features. The Project area is not located within a defined essential connectivity area as identified in the California Essential Habitat Connectivity Project (Spencer et al. 2010). However, the portion of the San Joaquin River that occurs within the Project area serves as one of two primary migratory wildlife corridors for special-status anadromous fish species that migrate from the Pacific Ocean to tributaries of the Sacramento and San Joaquin Rivers and vice versa.

4.2.3 Invasive Plants

Invasive plants (i.e., noxious weeds) are undesirable, non-native plants that commonly invade disturbed sites. Most species were introduced from Europe and Asia and many are known to negatively affect native wildlife habitat and plant communities. When disturbance results in the creation of habitat openings or in the loss of intact native vegetation, invasive plants may colonize the site and spread, often out-competing native species. Once established, they are very difficult to eradicate.

All pertinent non-native plant species were reviewed to determine their status as invasive plants according to the ratings in the California Invasive Plant Inventory produced by California Invasive Plant Council (Cal-IPC) (Cal-IPC

2006, 2021). Cal-IPC categorizes non-native invasive plants into three categories of overall negative ecological impact in California as “high”, “moderate”, and “limited”. Invasive species with a Cal-IPC rating of “high” that were observed in the Project area include Himalayan blackberry.

4.2.4 Sensitive Natural Communities

The CDFW maintains a list of California sensitive natural communities. Sensitive natural communities are classified following the technical approach described in A Manual of California Vegetation, Second Edition (MCV) (Sawyer et al. 2009) and the CNPS web-based version of the manual, A Manual of California Vegetation Online (CNPS 2021b). The MCV describes common to rare vegetation types in California and is the authority on vegetation classification for large- to fine-scale vegetation mapping efforts in the state. The current list of California Sensitive Natural Communities (CDFW 2021f) was reviewed to determine if any sensitive natural communities occur in the survey area. No sensitive natural communities are present in the Project area.

The CNDDB also identifies locations of rare natural communities. Rare natural communities are those communities that are of highly limited distribution, and may or may not contain rare, threatened, or endangered species. The CNDDB ranks natural communities according to their rarity and endangerment in California. The CNDDB was reviewed for rare natural communities. No rare natural communities were reported to occur in the Project area; however, Stabilized Interior Dunes (rank S1.1) occurs just west (approximately 0.12 miles) of the Project area, within the Antioch Dunes National Wildlife Refuge.

4.2.5 Special-Status Plant Species

Regionally occurring special-status plant species were identified based on a review of pertinent literature, the USFWS species list, CNDDB, and CNPS database records, and the reconnaissance-level biological field survey results. CNNDB special-status plant species occurrences within five miles of the Project area are illustrated in Appendix A, Figure 3. For each species, habitat requirements were assessed and compared to the habitats in the survey area and immediate vicinity to determine if potential habitat occurs in the Project area. For the purposes of this review, all regionally occurring plant species listed under the FESA, CESA and CNPS are included in Table 1, regardless of whether the Project area provides potential habitat. Based on database records 40 special-status plants were evaluated for their potential to occur within the Project area. Of these 40 species, none were found to have any moderate or high potential to occur within the Project area due to the urban and disturbed annual grassland habitats.

Table 1. Special-Status Plant Species with Potential to Occur in the Project Area

Common Name Scientific Name	Listing Status[1] (Fed/State/CRPR)	Known Habitat and Elevation Range (Feet)	Blooming Period	Potential for Occurrence
Large-flowered fiddleneck *Amsinckia grandiflora*	FE/SE/1B.1	Cismontane woodland and valley and foothill grassland. Elev. 885-1805 ft.	Apr-May	**Low**. The Project area does not contain woodland habitat. The Project area does contain annual grassland; however, the grassland is highly disturbed and provides only marginal habitat for this species.
Mt. Diablo manzanita *Arctostaphylos auriculata*	-/-/1B.3	Chaparral in sandstone soil or cismontane woodland. Elev. 440-2135 ft.	Jan-Mar	**Absent**. The Project area does not contain chaparral or woodland habitat and this species was not observed during the reconnaissance survey.
Contra Costa manzanita *Arctostaphylos manzanita* ssp. *laevigata*	-/-/1B.2	Rocky soils in chaparral. Elev. 1410-3610 ft.	Jan-Mar	**Absent**. The Project area does not contain chaparral habitat and this species was not observed during the reconnaissance survey.
Alkali milk-vetch *Astragalus tener* var. *tener*	-/-/1B.2	Valley and foothill grassland in adobe clay soil; playas and vernal pools with alkaline soil. Elev. 0-200 ft.	Mar-Jun	**Absent**. The Project area does not contain adobe clay soils, playas or vernal pools with alkaline soils and this species was not observed during the reconnaissance survey.
Heartscale *Atriplex cordulata* var. *cordulata*	-/-/1B.2	Saline or alkaline soils in chenopod scrub, meadows and seeps, and valley and foothill grassland. Elev. 0-1835 ft.	Apr-Oct	**Low**. The Project area does not contain chenopod scrub or meadows and seeps. The Project area does contain annual grassland; however, the grassland is highly disturbed and provides only marginal habitat for this species.
Brittlescale *Atriplex depressa*	-/-/1B.2	Alkaline and clay soils in chenopod scrub, meadows and seeps, playas, valley and foothill grassland, and vernal pools. Elev. 0-1050 ft.	Apr-Oct	**Low**. The Project area does not contain chenopod scrub, meadows and seeps, playas, or vernal pools. The Project area does contain annual grassland; however, the grassland is highly disturbed and provides only marginal habitat for this species.

Common Name Scientific Name	Listing Status[1] (Fed/State/CRPR)	Known Habitat and Elevation Range (Feet)	Blooming Period	Potential for Occurrence
Big tarplant *Blepharizonia plumosa*	-/-/1B.1	Usually clay soils in valley and foothill grassland. Elev. 100-1660 ft.	July-Oct	**Low**. The Project area does contain annual grassland; however, the grassland is highly disturbed and provides only marginal habitat for this species.
Mt. Diablo fairy-lantern *Calochortus pulchellus*	-/-/1B.2	Chaparral, cismontane woodland, riparian woodland, and valley and foothill grassland. Elev. 100-2755 ft.	Apr-Jun	**Low**. The Project area does not contain chaparral or woodland. The Project area does contain annual grassland; however, the grassland is highly disturbed and provides only marginal habitat for this species.
Congdon's tarplant *Centromadia parryi* ssp. *congdonii*	-/-/1B.1	Valley and foothill grassland in alkaline soils. Elev. 0-755 ft.	May-Oct	**Low.** The Project area does contain annual grassland; however, the grassland is highly disturbed and provides only marginal habitat for this species.
Soft salty bird's-beak *Chloropyron molle* ssp. *molle*	FE/SR/1B.2	Coastal salt marshes and swamps. Elev. 0-10 ft.	Jun-Nov	**Absent.** The Project area does not contain coastal salt marshes or swamps (salt grass/pickleweed marshes) and this species was not observed during the reconnaissance survey.
Bolander's water-hemlock *Cicuta maculata* var. *bolanderi*	-/-/2B.1	Coastal fresh or brackish water marshes and swamps. Elev. 0-660 ft.	Jul-Sep	**Absent.** Project area does not contain coastal fresh or brackish marshes or swamps and this species was not observed during the reconnaissance survey.
Hoover's cryptantha *Cryptantha hooveri*	-/-/1A	Inland dunes and valley and foothill grassland in sandy soils. Elev. 30-490 ft.	Apr-May	**Low**. The Project area does not contain inland dune habitat. The Project area does contain annual grassland; however, the grassland is highly disturbed and provides only marginal habitat for this species.

Common Name Scientific Name	Listing Status[1] (Fed/State/CRPR)	Known Habitat and Elevation Range (Feet)	Blooming Period	Potential for Occurrence
Dwarf downingia *Downingia pusilla*	-/-/2B.2	Valley and foothill grassland in mesic habitats and vernal pools. Elev. 5-1460 ft.	Mar-May	**Low.** The Project area does not contain vernal pool habitat. The Project area does contain annual grassland; however, the grassland is highly disturbed and provides only marginal habitat for this species.
Antioch Dunes buckwheat *Eriogonum nudum* var. *psychicola*	-/-/1B.1	Inland dunes. Elev. 0-65 ft.	Jul-Oct	**Absent.** Project area does not contain inland dunes and this species was not observed during the reconnaissance survey.
Mt. Diablo buckwheat *Eriogonum truncatum*	-/-/1B.1	Sandy soils in chaparral, coastal scrub, and valley and foothill grassland. Elev. 10-1150 ft.	Apr-Sep	**Low.** The Project area does not contain chaparral or coastal scrub habitat. The Project area does contain annual grassland; however, the grassland is highly disturbed and provides only marginal habitat for this species.
Jepson's coyote Thistle *Eryngium jepsonii*	-/-/1B.2	Valley and foothill grassland, vernal pools in clay soil. Elev. 10-985 ft.	Apr-Aug	**Absent.** The Project area does not contain vernal pool habitat and this species was not observed during the reconnaissance survey.
Contra Costa wallflower *Erysimum capitatum* var. *angustatum*	FE/SE/1B.1	Inland dunes. Elev. 10-70 ft.	Mar-Jul	**Absent.** Project area does not contain inland dunes and this species was not observed during the reconnaissance survey.
Diamond-petaled California poppy *Eschscholzia rhombipetala*	-/-/1B.1	Valley and foothill grassland in alkaline and clay soils. Elev. 0-3200 ft.	Mar-Apr	**Low.** The Project area does contain annual grassland; however, the grassland is highly disturbed and provides only marginal habitat for this species.

Common Name Scientific Name	Listing Status[1] (Fed/State/CRPR)	Known Habitat and Elevation Range (Feet)	Blooming Period	Potential for Occurrence
San Joaquin spearscale *Extriplex joaquinana*	-/-/1B.2	Chenopod scrub, meadows and seeps, playas, and valley and foothill grassland in alkaline soil. Elev. 0-2740 ft.	Apr-Oct	**Low.** The Project area does not contain chenopod scrub or meadows and seeps. The Project area does contain annual grassland; however, the grassland is highly disturbed and provides only marginal habitat for this species.
Fragrant fritillary *Fritillaria liliacea*	-/-/1B.2	Cismontane woodland, coastal prairie, coastal scrub, valley and foothill grassland often in serpentinite soil. Elev. 10-1345 ft.	Feb-Apr	**Low.** The Project area does not contain woodland, coastal prairie, or coastal scrub habitat. The Project area does contain annual grassland; however, the grassland is highly disturbed and provides only marginal habitat for this species.
Diablo helianthella *Helianthella castanea*	-/-/1B.2	Usually rocky, axonal soils, often in partial shade in broadleafed upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, and valley and foothill grassland. Elev. 195-4265 ft.	Mar-Jun	**Low.** The Project area does not contain forest, woodland, chaparral, or coastal scrub habitat. The Project area does contain annual grassland; however, the grassland is highly disturbed and provides only marginal habitat for this species.
Brewer's western flax *Hesperolinon breweri*	-/-/1B.2	Usually serpentinite soils in chaparral, cismontane woodland, valley and foothill grassland. Elev. 100-3100 ft.	May-Jul	**Low.** The Project area does not contain woodland or chaparral habitat. The Project area does contain annual grassland; however, the grassland is highly disturbed and provides only marginal habitat for this species.
Woolly rose-mallow *Hibiscus lasiocarpos* var. *occidentalis*	-/-/1B.2	Freshwater marshes and swamps, often in riprap on sides of levees. Elev. 0-395 ft.	Jun-Sep	**Absent.** The Project area does not contain freshwater marshes and swamps and this species was not observed during the reconnaissance survey.
Carquinez goldenbush *Isocoma arguta*	-/-/1B.1	Valley and foothill grassland in alkaline soil. Elev. 0-70 ft.	Aug-Dec	**Low.** The Project area does contain annual grassland; however, the grassland is highly disturbed and provides only marginal habitat for this species.

Common Name Scientific Name	Listing Status[1] (Fed/State/CRPR)	Known Habitat and Elevation Range (Feet)	Blooming Period	Potential for Occurrence
Contra Costa goldfields *Lasthenia conjugens*	FE/-/1B.1	Cismontane woodland, playas in alkaline soil, mesic valley and foothill grassland, and vernal pools in mesic areas. Elev. 0-1545 ft.	Mar-Jun	**Low.** The Project area does not contain woodland or playas. The Project area does contain annual grassland; however, the grassland is highly disturbed and provides only marginal habitat for this species.
Delta tule pea *Lathyrus jepsonii* var. *jepsonii*	-/-/1B.2	Freshwater and brackish marshes and swamps. Elev. 0-20 ft.	May-Sep	**Absent.** The Project area does not contain freshwater or brackish marshes and swamps and this species was not observed during the reconnaissance survey.
Mason's lilaeopsis *Lilaeopsis masonii*	-/SR/1B.1	Wetlands, riparian, freshwater marsh, brackish marsh, and wetland riparian. Elev. 0-32 ft.	Apr-Nov	**Absent.** The Project area does not contain freshwater or brackish marshes, wetlands, or riparian wetlands and this species was not observed during the reconnaissance survey.
Delta mudwort *Limosella australis*	-/-/2B.1	Riparian scrub, freshwater or brackish marshes and swamps, usually on mud banks. Elev. 0-10 ft.	May-Aug	**Absent.** The Project area does not contain freshwater or brackish marshes or riparian scrub habitat and this species was not observed during the reconnaissance survey.
Showy golden madia *Madia radiata*	-/-/1B.1	Cismontane woodland and valley and foothill grassland. Elev. 80-3985 ft.	Mar-May	**Low.** The Project area does not contain woodland habitat. The Project area does contain annual grassland; however, the grassland is highly disturbed and provides only marginal habitat for this species.
Hall's bush-mallow *Malacothamnus hallii*	-/-/1B.2	Chaparral and coastal scrub. Elev. 30-2500 ft.	May-Oct	**Absent.** The Project area does not contain chaparral or coastal scrub habitat and this species was not observed during the reconnaissance survey.

Common Name Scientific Name	Listing Status[1] (Fed/State/CRPR)	Known Habitat and Elevation Range (Feet)	Blooming Period	Potential for Occurrence
Shining navarretia *Navarretia nigelliformis* ssp. *radians*	-/-/1B.2	Sometimes clay soils in cismontane woodland, valley and foothill grassland, and vernal pools. Elev. 210-3280 ft.	Apr-Jul	**Low.** The Project area does not contain woodland or vernal pools. The Project area does contain annual grassland; however, the grassland is highly disturbed and provides only marginal habitat for this species.
Colusa grass *Neostapfia colusana*	FT/CE/1B.1	Large vernal pools with adobe soils. Elev. 15-655 ft.	May-Aug	**Absent.** The Project area does not contain vernal pools and this species was not observed during the reconnaissance survey.
Antioch Dunes evening-primrose *Oenothera deltoides* ssp. *howellii*	FE/SE/1B.1	Inland dunes. Elev. 0-100 ft.	Mar-Sep	**Absent.** The Project area does not contain inland dunes and this species was not observed during the reconnaissance survey.
Bearded popcornflower *Plagiobothrys hystriculus*	-/-/1B.1	Often in vernal swales in mesic valley and foothill grassland and vernal pool margins. Elev. 0-900 ft.	Apr-May	**Absent.** The Project area does not contain vernal pools or grasslands with vernal swales and this species was not observed during the reconnaissance survey.
Eel-grass pondweed *Potamogeton zosteriformis*	-/-/2B.2	Freshwater marshes and swamps. Elev. 0-6100 ft.	Jun-Jul	**Absent.** The Project area does not contain freshwater marshes and swamps and this species was not observed during the reconnaissance survey.
Chaparral ragwort *Senecio aphanactis*	-/-/2B.2	Sometimes in alkaline soils in chaparral, cismontane woodland, and coastal scrub. Elev. 45-2625 ft.	Jan-May	**Absent.** The Project area does not contain chaparral, woodland, or coastal scrub habitat and this species was not observed during the reconnaissance survey.
Keck's checkerbloom *Sidalcea keckii*	FE/-/1B.1	Serpentinite and clay soils in cismontane woodland and valley and foothill grassland. Elev. 245-2130 ft.	Apr-May	**Low.** The Project area does not contain woodland habitat. The Project area does contain annual grassland; however, the grassland is highly disturbed and provides only marginal habitat for this species.

Common Name Scientific Name	Listing Status[1] (Fed/State/CRPR)	Known Habitat and Elevation Range (Feet)	Blooming Period	Potential for Occurrence
Suisun Marsh aster *Symphyotrichum lentum*	-/-/1B.2	Brackish and freshwater marshes and swamps. Elev. 0-10 ft.	Apr-Nov	**Absent.** The Project area does not contain freshwater or brackish marshes or swamps and this species was not observed during the reconnaissance survey.
Caper-fruited tropidocarpum *Tropidocarpum capparideum*	-/-/1B.1	Valley and foothill grassland (alkaline hills) Elev. 0-1495 ft.	Mar-Apr	**Low.** The Project area does contain annual grassland; however, the grassland is highly disturbed and provides only marginal habitat for this species.
Oval-leaved viburnum *Viburnum ellipticum*	-/-/2B.3	Chaparral, cismontane woodland, and lower montane coniferous forest. Elev. 705-4595 ft.	May-Jun	**Absent.** The Project area does not contain chaparral, woodland, or forest habitat and this species was not observed during the reconnaissance survey.

[1]Federal and State Status Codes
- = No status, or not applicable
FE = Listed as endangered under the Federal Endangered Species Act (FESA)
FT = Listed as threatened under FESA
SE = Listed as endangered under the California Endangered Species Act (CESA)
SR = Listed as rare under CESA
ST = Listed as threatened under CESA
CE = Listed as candidate endangered CESA

CNPS Ranking
1A = Presumed extinct in California and either rare or extinct elsewhere.
1B = Rare, threatened, or endangered in California and elsewhere.
2A = Presumed extinct in California but common elsewhere.
2B = Rare, threatened, or endangered in California but more common elsewhere.

Threat Ranks
0.1 = Seriously threatened in California (more than 80% of occurrences threatened/high degree and immediacy of threat).
0.2 = Moderately threatened in California (20-80% occurrences threatened/moderate degree and immediacy of threat).
0.3 = Not very threatened in California (less than 20% of occurrences threatened/low degree and immediacy of threat or no current threats known).

4.2.6 Special-Status Animal Species

Regionally occurring special-status animal species were identified based on a review of pertinent literature, the USFWS species list, CNDDB database records, a query of the California WHRS (CDFW 2014), and the reconnaissance-level biological field survey results. CNNDB special-status animal species occurrences within five miles of the Project area are illustrated in Appendix A, Figure 2. For each species, habitat requirements were assessed and compared to the habitats in the Project area and immediate vicinity to determine the species' potential to occur in or near the Project area. For the purposes of this review, all regionally occurring wildlife species listed under the FESA or CESA are included in Table 2, regardless of whether the Project area provides potential habitat. The literature and database review identified 50 special-status wildlife species with suitable habitat or known to occur in or near the Project area. Based on initial assessment of wildlife habitats conducted during the reconnaissance-level field survey, 16 of these species were determined to have a moderate to high potential to occur.

Table 2. Special-Status Animal Species within Potential to Occur in the Survey Area

Common Name Scientific Name	Listing Status[1] (Fed/State)	Known Habitat Requirements	Potential for Occurrence
Invertebrates			
Conservancy fairy shrimp *Branchinecta conservatio*	FE/-	Endemic to the grasslands of the northern two-thirds of the Central Valley. Inhabits astatic pools located in swales formed by old, braided alluvium; filled by winter/spring rains, last until June.	**Absent** No astatic pool habitat occurs within the Project area.
Vernal pool fairy shrimp *Branchinecta lynchi*	FT/-	Vernal pools, swales, ephemeral freshwater habitats, often grass or mud-bottomed swales, earth slump or basalt-flow depression pools in grasslands.	**Absent** No vernal pool habitat occurs within the Project area.
Vernal pool tadpole shrimp *Lepidurus packardi*	FE/-	Inhabits vernal pools and swales in the Sacramento Valley containing clear to highly turbid water. Pools commonly found in grass-bottomed swales of unplowed grasslands.	**Absent** No vernal pool habitat occurs within the Project area.
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	FT/-	Occurs in riparian scrub only in the Central Valley. Requires blue elderberry (*Sambucus mexicana*) for breeding. Lays eggs in elderberries 2 to 8 inches in diameter. Often prefers “stressed” elderberries.	**Absent**. No elderberry shrubs are present in the Project area.
Delta Green Ground Beetle *Elaphrus viridis*	FT/-	Restricted to the margins of vernal pools in the grassland area between Jepson Prairie and Travis AFB. Prefers the sandy mud substrate where it slopes gently into the water, with low-growing vegetation, 25-100% cover.	**Absent.** Project area is outside the range of this species.
Lange's metalmark butterfly *Apodemia mormo langei*	FE/-	Inhabits stabilized dunes along the San Joaquin River. Endemic to Antioch Dunes, Contra Costa County. Primary host plant is *Eriogonum nudum* var *auriculatum*; feeds on nectar of other wildflowers, as well as host plant.	**Low.** The Project area does contain potential foraging habitat and there is a CNDDB occurrence record (1) from 2008 located in the adjacent Antioch Dunes National Wildlife Refuge. However, the Project area lacks this species host plants and the annual grassland contains minimal wildflowers.

Common Name Scientific Name	Listing Status[1] (Fed/State)	Known Habitat Requirements	Potential for Occurrence
San Bruno elfin butterfly *Callophrys mossii bayensis*	FE/-	Found in coastal, mountainous areas with grassy ground cover, mainly in the vicinity of San Bruno Mountain, San Mateo County. Colonies are located on steep, north-facing slopes. Larval host plant is *Sedum spathulifolium*.	**Absent.** Project area is outside the range of this species.
Crotch bumble bee *Bombus crotchii*	-/CE	Coastal California east to the Sierra-Cascade crest and south into Mexico. Found in open grassland and scrub habitats. Food plant genera include *Antirrhinum* spp., *Phacelia* spp., *Clarkia* spp., *Dendromecon* spp., *Eschscholzia* spp., and *Eriogonum* spp.	**Low.** The Project area does contain potential foraging habitat and there is a historic CNDDB occurrence record (14) from 1926 located approximately 0.71 miles southwest of the Project area.
Western bumble bee *Bombus occidentalis*	-/CE	Meadows and grasslands with abundant floral resources throughout the mountains and northern coast of California. Nests in underground cavities including old rodent burrows in open west-southwest slopes bordered by trees.	**Low.** The Project area does contain potential foraging habitat and there is a historic CNDDB occurrence record (215) from 1979 located in the adjacent Antioch Dunes National Wildlife Refuge. Currently this species is found mostly in high meadows or coastal environments.
Fish			
Pacific lamprey *Entosphenus tridentatus*	-/SSC	Found in Pacific Coast streams north of San Luis Obispo County, however regular runs in Santa Clara River. Size of runs is declining. Swift-current gravel-bottomed areas for spawning with water temps between 12-18 C. Ammocoetes need soft sand or mud.	**High.** The portion of the San Joaquin River within the Project area provides suitable aquatic habitat during migration to natal spawning rivers. There are no CNDDB records within 5 miles of the Project Area.
Western river lamprey *Lampetra ayresii*	-/SSC	Cool streams that reach the ocean and that have shallow, partly shaded pools and clear-water depression pools. In the Central Valley, their upstream range appears to be limited by impassable dams that exist on all large rivers.	**High.** The portion of the San Joaquin River within the Project area provides suitable aquatic habitat. There are no CNDDB records within 5 miles of the Project Area.

Common Name Scientific Name	Listing Status[1] (Fed/State)	Known Habitat Requirements	Potential for Occurrence
Green sturgeon – southern DPS *Acipenser medirostris*	FT/SSC	These are the most marine species of sturgeon. Abundance increases northward of Point Conception. Spawns in the Sacramento, Klamath, and Trinity Rivers at temperatures between 8 and 14 degrees Celsius. Preferred spawning substrate is large cobble but can range from clean sand to bedrock.	**High.** The portion of the San Joaquin River within the Project area provides suitable aquatic habitat during migration to natal spawning rivers. There are no CNDDB records within 5 miles of the Project Area.
White sturgeon *Acipenser transmontanus*	-/SSC	White sturgeon primarily live in estuaries of large rivers but migrate to spawn in fresh water and often make long ocean movements between river systems. White sturgeon primarily occur in the Sacramento River, Feather, and San Joaquin Rivers.	**High.** The portion of the San Joaquin River within the Project area provides suitable aquatic habitat during migration to natal spawning rivers. There are no CNDDB records within 5 miles of the Project Area.
Steelhead – Central Valley DPS *Oncorhynchus mykiss irideus*	FT/-	Populations in the Sacramento and San Joaquin rivers and their tributaries.	**High.** The portion of the San Joaquin River within the Project area provides suitable aquatic habitat during migration to natal spawning rivers. There is a CNDDB occurrence record (27) from 2012 located within the San Joaquin River, just north of the Project area.
Chinook salmon – Central Valley Spring run ESU *Oncorhynchus tshawytscha*	FT/ST	Populations occur in the Sacramento and San Joaquin rivers and their tributaries. Spring run Chinook migrate far upstream in the spring, shelter in deep, cool pools, waiting to spawn until fall when temperatures decrease. After hatching, juveniles spend at least one summer in freshwater rearing areas, so the stream must have either perennial flow or cool intermittent pools with subsurface flow during the dry season.	**High.** The portion of the San Joaquin River within the Project area provides suitable aquatic habitat during migration to natal spawning rivers. There are no CNDDB records within 5 miles of the Project Area.

Common Name Scientific Name	Listing Status[1] (Fed/State)	Known Habitat Requirements	Potential for Occurrence
Chinook salmon - Central Valley fall/ late fall-run ESU *Oncorhynchus tshawytscha*	-/SSC	Spawn and rear in main-stem Sacramento River. Require cool year-round water temperatures, since spawning occurs during the summer. Requires deep pools and riffles, and clean gravel and cobble substrate to spawn.	**High.** The portion of the San Joaquin River within the Project area provides suitable aquatic habitat during migration to natal spawning rivers. There are no CNDDB records within 5 miles of the Project Area.
Chinook salmon - Sacramento River winter-run ESU *Oncorhynchus tshawytscha*	FE/SE	Sacramento River below Keswick Dam. Spawns in the Sacramento River, but not in tributary streams. Requires clean, cold water over gravel beds with water temperatures between 6 and 14 C for spawning.	**High.** The portion of the San Joaquin River within the Project area provides suitable aquatic habitat during migration to natal spawning rivers. There are no CNDDB records within 5 miles of the Project Area.
Delta Smelt *Hypomesus transpacificus*	FT/SE	Sacramento-San Joaquin Delta. Seasonally in Suisun Bay, Carquinez Strait & San Pablo Bay. Seldom found at salinities > 10 parts per thousand (ppt). Most often at salinities < 2ppt.	**High.** The portion of the San Joaquin River within the Project area provides suitable aquatic habitat. There is a CNDDB occurrence record (4) from 2004 located approximately 3 miles northwest of the Project area.
Longfin smelt *Spirinchus thaleichthys*	C/ST	Euryhaline, nektonic & anadromous. Found in open waters of estuaries, mostly in middle or bottom of water column. Prefer salinities of 15-30 ppt but can be found in completely freshwater to almost pure seawater.	**High.** The portion of the San Joaquin River within the Project area provides suitable aquatic habitat. There is a CNDDB occurrence record (33) from 2012 located within the Project area.
Sacramento splittail *Pogonichthys macrolepidotus*	-/SSC	Endemic to the lakes and rivers of the Central Valley, but now confined to the Delta, Suisun Bay and associated marshes. Slow moving river sections, dead end sloughs. Requires flooded vegetation for spawning and foraging for young.	**Moderate.** The portion of the San Joaquin River within the Project area provides suitable aquatic habitat. There are no CNDDB records within 5 miles of the Project Area.
Sacramento hitch *Lavinia exilicauda exilicauda*	-/SSC	Inhabit warm, lowland, waters including clear streams, turbid sloughs, lakes and reservoirs.	**Moderate.** The portion of the San Joaquin River within the Project area provides suitable aquatic habitat. There are no CNDDB records within 5 miles of the Project Area.
Hardhead *Mylopharodon conocephalus*	-/SSC	Low to mid-elevation streams in the Sacramento-San Joaquin drainage. Also present in the Russian River. Clear, deep pools with sand-gravel-boulder bottoms and slow water velocity. Not found where exotic centrarchids predominate.	**Moderate.** The portion of the San Joaquin River within the Project area provides suitable aquatic habitat. There are no CNDDB records within 5 miles of the Project Area.

Common Name Scientific Name	Listing Status[1] (Fed/State)	Known Habitat Requirements	Potential for Occurrence
Sacramento perch *Archoplites interruptus*	-/SSC	Historically found in the sloughs, slow-moving rivers, and lakes of the Central Valley. Aquatic vegetation essential for young.	**Moderate.** The portion of the San Joaquin River within the Project area provides suitable aquatic habitat. There is a CNDDB occurrence record (3) from 1980 located approximately 0.47 miles northeast of the Project area.
Amphibians			
California tiger salamander *Ambystoma californiense*	FE,FT/ST	Central Valley DPS federally listed as threatened. Santa Barbara County and Sonoma County DPS federally listed as endangered. Needs underground refuges, especially ground squirrel burrows, and vernal pools or other seasonal water sources for breeding.	**Absent.** No suitable aquatic or upland habitat is present in the Project area.
California red-legged frog *Rana draytonii*	FT/SSC	Requires perennial or near-perennial aquatic habitats, especially for breeding; often slow-moving streams, freshwater pools and ponds over 1-foot deep, often with overhanging vegetation; adjacent upland habitats are often used for temporary refuges or dispersal movements	**Absent.** No suitable aquatic or upland habitat is present in the Project area.
Foothill yellow-legged frog *Rana boylii*	-/SE, SSC	Inhabits partly-shaded, shallow streams and riffles with a rocky substrate in a variety of habitats. Needs cobble-sized substrate for egg-laying and at least 15 weeks of water to attain metamorphosis. Listing status for this species has been determined by the California Fish and Game Commission as the following: Southwest/South Coast, West/Central Coast, and East/Southern Sierra clades are now endangered; Northeast/Northern Sierra and Feather River clades are now threatened; and Northwest/North Coast clade is a SSC.	**Absent.** No suitable aquatic or upland habitat is present in the Project area.
Reptiles			
Northern California legless lizard *Anniella pulchra*	-/SSC	Sandy or loose loamy soils under sparse vegetation. Soil moisture is essential. They prefer soils with a high moisture content.	**Absent.** No suitable habitat is present in the Project area.

Common Name Scientific Name	Listing Status[1] (Fed/State)	Known Habitat Requirements	Potential for Occurrence
Alameda whipsnake *Masticophis lateralis euryxanthus*	FT/ST	Typically found in chaparral and scrub habitats but will also use adjacent grassland, oak savanna and woodland habitats. Mostly south-facing slopes and ravines, with rock outcrops, deep crevices or abundant rodent burrows, where shrubs form a vegetative mosaic with oak trees and grasses.	**Absent.** Project area is outside the range of this species.
California glossy snake *Arizona elegans occidentalis*	-/SSC	Patchily distributed from the eastern portion of San Francisco Bay, southern San Joaquin Valley, and the Coast, Transverse, and Peninsular ranges, south to Baja California. Generalist reported from a range of scrub and grassland habitats, often with loose or sandy soils.	**Absent.** No suitable habitat is present in the Project area.
Giant gartersnake *Thamnophis gigas*	FT/ST	Prefers freshwater marsh and low gradient streams. Has adapted to drainage canals and irrigation ditches. This is the most aquatic of the gartersnakes in California.	**Absent.** No suitable aquatic habitat is present in the Project area.
Western pond turtle *Emys marmorata*	-/SSC	Slow water aquatic habitat with available basking sites. Hatchlings require shallow water with dense submergent or short emergent vegetation. Require an upland oviposition site near the aquatic site.	**Absent.** No suitable aquatic habitat is present in the Project area.
Birds			
White-tailed kite *Elanus leucurus*	-/FP	Rolling foothills and valley margins with scattered oaks & river bottomlands or marshes next to deciduous woodland. Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.	**Absent.** No suitable nesting or foraging habitat is present in the Project area.
Swainson's hawk *Buteo swainsoni*	-/ST	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranchlands with groves or lines of trees. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	**Absent.** No suitable nesting or foraging habitat is present in the Project area.

Common Name Scientific Name	Listing Status[1] (Fed/State)	Known Habitat Requirements	Potential for Occurrence
California Ridgway's rail *Rallus obsoletus*	FE/SE, FP	Found in salt and brackish marshes traversed by tidal sloughs in the vicinity of San Francisco Bay. Associated with abundant growths of pickleweed but feeds away from cover on invertebrates from mud-bottomed sloughs.	**Absent**. No suitable nesting or foraging habitat is present in the survey area.
California black rail *Laterallus jamaicensis coturniculus*	-/ST	Freshwater marshes, wet meadows and shallow margins of saltwater marshes boarding larger bays. Requires dense vegetation for nesting habitat.	**Absent.** No suitable nesting or foraging habitat within the Project area.
California least tern *Sternula antillarum browni*	FE/SE, FP	Nests along the coast from San Francisco Bay south to northern Baja California. Colonial breeder on bare or sparsely vegetated, flat substrates: sand beaches, alkali flats, landfills, or paved areas.	**Absent**. Project area is outside the range of this species.
Burrowing owl *Athene cunicularia*	-/SSC	Grasslands and ruderal habitats. Uses mammal burrows or other suitable underground cavities.	**Absent.** No suitable nesting or foraging habitat is present in the Project area due to lack of rodent burrows within the annual grassland.
Loggerhead shrike *Lanius ludovicianus*	-/SSC	Broken woodlands, savannah, pinyon-juniper, Joshua tree, and riparian woodlands, desert oases, scrub & washes. Prefers open country for hunting, with perches for scanning, and fairly dense shrubs and brush for nesting.	**Absent.** No suitable nesting or foraging habitat within the Project area.
Bank swallow *Riparia riparia*	-/ST	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole.	**Absent.** No suitable nesting or foraging habitat is present in the Project area.
Saltmarsh common yellowthroat *Geothlypis trichas sinuosa*	-/SSC	Resides in fresh and saltwater marshes and creeks of the San Francisco Bay region. Requires thick, continuous cover down to water surface for foraging; tall grasses, tule patches, willows for nesting.	**Absent.** No suitable nesting or foraging habitat is present in the Project area.

Common Name Scientific Name	Listing Status[1] (Fed/State)	Known Habitat Requirements	Potential for Occurrence
Song sparrow ("Modesto" population) *Melospiza melodia*	-/SSC	Endemic to California, where it resides only in the north-central portion of the Central Valley. Occurs in emergent freshwater marshes dominated by tules and cattails, riparian willow thickets, riparian forests of valley oak with sufficient understory of blackberry, and vegetated irrigation canals and levees. Prefers moderately dense vegetation for nesting and exposed ground or leaf litter for foraging.	**Absent**. Project area is outside the range of this species.
Suisun song sparrow *Melospiza melodia maxillaris*	-/SSC	Resides in brackish-water marshes surrounding Suisun Bay. Inhabits cattails, tules, and other sedges, and Salicornia; also known to frequent tangles bordering sloughs.	**Absent**. No suitable nesting or foraging habitat is present in the Project area.
Tricolored blackbird *Agelaius tricolor*	-/CE, SSC	Breeds near fresh water in dense emergent vegetation. Requires open water, protected nesting substrate, and foraging area with insect prey within a few kilometers of the colony.	**Absent**. No suitable nesting or foraging habitat is present in the Project area.
Mammals			
Pallid bat *Antrozous pallidus*	-/SSC	Found in deserts, grasslands, shrublands, woodlands, and forests. Most common in open, dry habitats with rocky areas for roosting.	**Absent**. No suitable roosting or foraging habitat is present in the Project area.
Western red bat *Lasiurus blossevillii*	-/SSC	Roosts primarily in trees, 2-40 ft above ground, from sea level up through mixed conifer forests. Prefers habitat edges and mosaics with trees that are protected from above and open below with open areas for foraging.	**Low.** Large trees adjacent to the Project area my provide marginal roosting habitat for this species.
San Joaquin kit fox *Vulpes macrotis mutica*	FE/ST	Found in annual grasslands or grassy open stages with scattered shrubby vegetation. Needs loose-textured sandy soils for burrowing, and suitable prey base.	**Absent.** No suitable habitat is present in the Project area.

Common Name Scientific Name	Listing Status[1] (Fed/State)	Known Habitat Requirements	Potential for Occurrence
California sea lion *Zalophus californianus*	MMPA/-	This species prefers sandy beaches or rocky coves for breeding and haul-out sites. Along the West Coast, they also haul out on marina docks as well as jetties and buoys. California sea lions range from southeast Alaska to the Pacific coast of central Mexico. Their primary breeding range is from the Channel Islands in southern California to central Mexico.	**Moderate.** The portion of the San Joaquin River within the Project area provides suitable aquatic habitat. There are documented occurrences within the lower reaches of the San Joaquin River.
Pacific harbor seal *Phoca vitulina*	MMPA/-	Harbor seals are found all along the West Coast of North America, from Baja California, Mexico to the Bering Sea. They are found resting on rocks and beaches along the coast and on floating ice in glacial fjords.	**Moderate.** The portion of the San Joaquin River within the Project area provides suitable aquatic habitat. There are documented occurrences within the lower reaches of the San Joaquin River.
American badger *Taxidea taxus*	-/SSC	Most abundant in drier, open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	**Absent.** No suitable habitat is present in the Project area.
Salt-marsh harvest mouse *Reithrodontomys raviventris*	FE/SE, FP	Occurs only in the saline emergent wetlands of San Francisco Bay and its tributaries. Primary habitat is pickleweed.	**Absent.** No suitable habitat is present in the Project area.

[1]Federal and State Status Codes

- = No status, or not applicable

FE = Listed as endangered under the Federal Endangered Species Act (FESA)

FT = Listed as threatened under FESA

MMPA = Listed under the Marine Mammal Protection Act

SE = Listed as endangered under the California Endangered Species Act (CESA)

ST = Listed as threatened under CESA

SSC = Designated as a Species of Special Concern by CDFW under the California Environmental Quality Act (CEQA)

FP = Fully Protected under the California Fish and Game Code (F.G.C.)

C = Candidate for listing as either endangered or threatened under FESA

CE = Candidate for listing as endangered under CESA

CT = Candidate for listing as threatened under CESA

5.0 RESULTS: BIOLOGICAL RESOURCES

5.1 HABITATS AND NATURAL COMMUNITIES OF CONCERN

Within the Project area, potential waters of the U.S. and USFWS and NMFS designated critical habitat and essential fish habitat occur.

5.1.1 Potential Waters of the U.S. and State

The portion of the San Joaquin River that occurs within the Project area associated with wharf improvements is considered potential waters of the U.S. and State, therefore subject to the USACE and RWQCB jurisdiction under Sections 404 and 401 of the Clean Water Act, and subject to CDFW jurisdiction under Section 1600 of the California Fish and Game Code (FGC). The San Joaquin River is also a navigable water of the U.S. under Section 10 of the Rivers and Harbors Act of 1899. No other potential waters of the U.S. or State were observed within the Project area during the reconnaissance-level biological field survey.

Construction activities and in-water work associated with the proposed wharf improvements would impact approximately 0.005 acres of potential waters of the U.S and approximately 0.2 acres for the over-water improvements. In addition, the Project will build approximately 11,918 square feet (sq ft) of permanent over-water structure. This is a net increase of 9, 286 sq ft of over-water structure from the original wharf, the majority of which will be solid cover that will shade the habitat. Recommended mitigation measures for impacts to potential waters of the U.S. are listed in Section 6.2 below. The Project will require a USACE Section 404 Nationwide Permit, RWQCB Section 401 Water Quality Certification, and CDFW Section 1602 Lake or Streambed Alteration Agreement.

5.1.2 Critical Habitat

Within the Project area (associated with wharf improvements), USFWS and NMFS designated critical habitat occurs for five special-status fish species including delta smelt (*Hypomesus transpacificus*), Central Valley Spring Run chinook salmon Evolutionarily Significant Unit (ESU) (*Oncorhynchus tshawytscha*), Sacramento River Winter Run chinook salmon ESU (*Oncorhynchus tshawytscha*), California Central Valley steelhead Distinct Population Segment (DPS) (*Oncorhynchus mykiss irideus*), and southern DPS green sturgeon (*Acipenser medirostris*). The Project will require Section 7 Consultation with USFWS and NMFS, including the preparation of a Biological Assessment to evaluate impacts, AMMs, and compensatory mitigation for federally endangered and threatened fish species and their critical habitats.

5.1.3 Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) was passed in 1976 for the conservation and management of the fishery resources of the U.S. to prevent overfishing, to rebuild overfished stocks, to ensure conservation, and to facilitate long-term protection of Essential Fish Habitat (EFH). EFH is defined as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” The MSA is implemented by regional Fishery Management Councils that work with NMFS to develop and implement fishery management plans (FMP). The plans must identify the EFH for each fishery within their jurisdiction. When a project is proposed that could adversely affect EFH, federal agencies must consult with NMFS in order to obtain avoidance and minimization consultation as well as conservation and enhancement recommendations.

Within the Project area, EFH for species managed under the Pacific Coast Salmon Fishery Management Plan (FMP) (Chinook salmon) and also for species managed under the Coastal Pelagic Species FMP and Pacific Coast Groundfish FMP occur. The Project will require EFH Consultation with NMFS, including the preparation of an EFH Assessment to analyze the potential adverse effects of the Project activities associated with wharf improvements on EFH and the managed species and proposed compensatory mitigation.

5.2 SPECIAL-STATUS ANIMAL SPECIES

The portion of the San Joaquin River within the Project area provides potentially suitable habitat for 16 special-status species, including 14 special-status fish species and 2 marine mammals protected by the MMPA. These species have a moderate or high potential to occur within the Project area. These species are listed below:

- Southern DPS Green Sturgeon (*Acipenser medirostris*), Federally threatened (FT)/species of special concern (SSC);
- White sturgeon (*Acipenser transmontanus*), SSC;
- Pacific lamprey (*Entosphenus tridentatus*), SSC;
- Delta smelt (*Hypomesus transpacificus*), FT/State endangered (SE);
- Western river lamprey (*Lampetra ayresii*), SSC;
- Sacramento hitch (*Lavinia exilicauda exilicauda*), SSC;
- Hardhead (*Mylopharodon conocephalus*), SSC;
- California Central Valley steelhead DPS (*Oncorhynchus mykiss irideus*), FT;
- Central Valley Spring Run Chinook Salmon ESU (*Oncorhynchus tshawytscha*), FT/State threatened (ST);
- Central Valley fall/ late fall-run Chinook Salmon ESU (*Oncorhynchus tshawytscha*), SSC;
- Sacramento River Winter Run Chinook Salmon ESU (*Oncorhynchus tshawytscha*), Federally endangered (FE)/SE;
- Sacramento splittail (*Pogonichthys macrolepidotus*), SSC;
- Sacramento perch (*Archoplites interruptus*), SSC;
- Longfin smelt (*Spirinchus thaleichthys*), Federal candidate (FC)/ST.
- Pacific harbor seal (*Phoca vitulina*), Marine Mammal Protection Act (MMPA); and
- California sea lion (*Zalophus californianus*), MMPA

Recommended mitigation measures for impacts special-status species and migratory birds are listed in Section 6.2 below.

5.2.1 Special-Status Fish

Southern DPS Green Sturgeon

The southernmost spawning population of green sturgeon is in the Sacramento River, with the principal spawning area located in the lower Feather River (Moyle 2002). Spawning populations of green sturgeon in the San Joaquin River are presumed to have been lost in the past 25-30 years. Green sturgeon are primarily marine species, entering into freshwater rivers mainly to spawn, although early life stages may reside in freshwater for up to two years (Moyle 2002). Adults typically migrate into fresh water from late February through late July. The spawning period occurs from March to July, with peak spawning occurring from mid-April to mid-June (Emmett et al. 1991). Green sturgeon prefer deep pools in large, turbulent, freshwater river mainstreams to spawn (Moyle et al. 1992). Juvenile green sturgeon emigrate out to sea primarily during the summer and fall before the end of their second year (Emmett et al. 1991). Green sturgeon adults, subadults, and juveniles are widely distributed throughout the Delta and estuary. Adults typically migrate upstream on the western edge of the Delta, returning to the ocean when river temperatures decrease and flows increase during the fall and early winter. They may hold in low gradient or off-channel sloughs or coves where temperatures are within acceptable thresholds. Larvae prefer open aquatic habitats for foraging, but utilize structure habitat during the day. Juvenile rearing habitats for green sturgeon include spawning areas and migration corridors. Rearing habitat utilization varies dependent on seasonal flows and temperatures. Juvenile green sturgeon are found year round in the Delta and use the region as a migration corridor, feeding area, and juvenile rearing area. Juvenile green sturgeon are strong swimmers and thus have the ability to select or avoid habitats. Green sturgeon are salvaged at the Central Valley Pumps and State Water Project pumping plants on an irregular basis throughout the year, verifying their presence in the south Delta (EPIC et al. 2001).

Once leaving spawning grounds in the Feather and Sacramento Rivers, juveniles of this species distribute into the delta and San Pablo Bay before moving out to the Pacific Ocean (Emmett et al. 1991). During this time, individuals may pass through, or forage within waters of the Project area. Because this species may forage in the Project area at any time of year as adults, or juveniles, this species has a high potential to occur within waters of the Project area.

White Sturgeon

This sturgeon is found in most estuaries along the Pacific coast, and are known to the San Francisco Bay Estuary. Adults in the San Francisco Bay Estuary system spawn in the Sacramento River and are not known to enter freshwater or non-tidal reaches of Estuary streams. White sturgeon typically spawn in May through June. The diet consists of crustaceans, mollusks, and some fish.

This species is known to spawn within both the Sacramento and San Joaquin Rivers (Pisces 2021). Both juveniles and adults of the species live a majority of their lives in brackish estuarine waters of bays and as such are likely to be found as both juveniles and adults foraging within waters of the Project area. Therefore, because the species is likely to migrate through, and forage within waters of the Project area, this species has a high potential to occur.

Pacific Lamprey

This anadromous lamprey is found along the entire California coast with regularity until becoming disjunct south of San Luis Obispo County, with the exception of regular runs to the Santa Clara River (Pisces 2021). With the exception of land-locked populations, this species spends the predatory phase of its life in the ocean, feeding off the bodily fluids of a variety of fish. This species is usually concentrated near the mouths of their spawning streams because its prey is most abundant in coastal areas (Moyle 2002). Adults move up into spawning streams between early March and late June. After hatching, ammocetes are washed downstream, where they burrow into soft substrates and filter feed. Five to seven years later, ammocetes undergo metamorphosis into the predatory phase of their life cycle, and out-migrate to the ocean as adults.

This species is known to spawn in the headwater streams of the San Joaquin River (Pisces 2021). Because the Project area is located along the migratory path for this species, the species has a high potential to occur within waters of the Project area.

Delta Smelt

Delta Smelt are a pelagic (live in the open water column away from the bottom) and euryhaline species (tolerant of a wide salinity range) found in brackish water. They are found only in the Sacramento- San Joaquin Estuary and as far upstream as the mouth of the American River on the Sacramento River and Mossdale on the San Joaquin River. They extend downstream as far as San Pablo Bay. During the late winter to early summer, delta smelt migrate to freshwater to spawn. Larvae hatch between 10-14 days, are planktonic (float with the water currents), and are washed downstream until they reach areas near the entrapment zone where salt and freshwater mix. Delta smelt are fast growing and short-lived with the majority of growth within the first 7 to 9 months of life. Most smelt die after spawning in the early spring although a few survive to a second year. Delta smelt feed entirely on small crustaceans (zooplankton).

CDFW monitors various life stages for this species with sampling locations in waters surrounding the Project area (CDFW 2021g). This species has been detected at sampling locations upstream and downstream of the Project area (Sommer and Mejia 2013). Because this species is regularly detected at sites surrounding the Project area, it has a high potential to occur within waters of the Project area.

Western River Lamprey

River lampreys prey upon a variety of fishes in the 10-30 centimeter (cm) total length size range, but the most common prey seem to be herring and salmon. Unlike other species of lamprey in California, river lampreys typically attach to the back of the host fish, above the lateral line, where they feed on muscle tissue. Little is known about habitat requirements in California, but presumably, the adults need clean, gravelly riffles in permanent streams for spawning, while the ammocetes require sandy backwaters or stream edges in which to bury themselves, where water quality is continuously high and temperatures do not exceed 77°F. Adults migrate back into fresh water in the fall and spawn during the winter or spring months in small tributary streams.

This species is known to spawn in the headwater streams of the San Joaquin River drainage (Pisces 2021). Because the Project area is located along the migratory path for this species, the species has a high potential to occur within waters of the Project area.

Sacramento Hitch

Sacramento hitch is omnivorous and feeds upon zooplankton and insects, usually in open waters or at the surface of streams (Moyle 2002). This species can reach a maximum size of 35 to 40 cm and can live an average of 4 to 6 years. They inhabit warm, lowland, waters including clear streams, turbid sloughs, lakes, and reservoirs. In creeks and streams, they are generally found in pools or runs among aquatic vegetation with the exception of some individuals occurring in riffles (Moyle et al 2015).

In rivers, they tend to stay in fairly limited areas and have considerable capacity to find velocity refuge in side pools (Jeffres et al. 2006). Spawning occurs mainly in riffles of stream tributaries to lakes, rivers, and sloughs after flow increases due to spring rains. Males fertilize the eggs as soon as the female releases them. Once fertilized, they sink to the bottom and become lodged within the gravel substrate. Hatching takes places approximately 3 to 7 days and larvae become free-swimming in about 3 to 4 days (Moyle et al 2015).

This species historically ranged throughout the Sacramento and San Joaquin valleys in low elevation streams and rivers. Today, most populations are absent from the San Joaquin River and its tributaries, but still occurs within most of its native range in the Sacramento River (Moyle et al 2015). The Project area is located near the confluence of the Sacramento and San Joaquin Rivers and multiple waterways connect the Sacramento and San Joaquin both upstream and downstream of the Project area. Therefore, this species could potentially forage within the Project Area and has a moderate potential to occur within open waters of the Project area.

Hardhead

Hardhead typically inhabit undisturbed areas of larger low- to mid-elevation streams. Most streams achieve summer temperatures in excess of 68°F. They prefer clear, deep pools and runs with sand-gravel-boulder substrates and slow velocities (Moyle 2002). Larval and post-larval fish probably remain along stream edges in dense cover of flooded vegetation or fallen tree branches (Moyle 2002).

This species is common through the mid elevation streams of the San Joaquin drainage but is rarely observed in the lower sections of the river in the Central Valley or the Delta. However, several small populations of this species have been documented in the lower San Joaquin River both upstream and downstream of the Project area (Pisces 2021). Therefore, while not as common as they are in upstream areas, this species may forage through waters of the Project area and has a moderate potential to occur.

California Central Valley steelhead DPS

The Central Valley DPS includes all naturally spawned populations (and their progeny) in the Sacramento and San Joaquin Rivers and their tributaries, excluding San Francisco and San Pablo bays and their tributaries. Preferred spawning habitat for steelhead is in perennial streams with cool to cold water temperatures, high dissolved oxygen levels and fast flowing water. During the winter or early spring the spawning fish reach suitable gravel riffles (shallow areas with gravel or cobble substrate) in the upper sections of streams and dig their redds. Abundant riffle areas for spawning and deeper pools with sufficient riparian cover for rearing are necessary for successful breeding. When steelhead spawn they nearly always return to the stream in which they were hatched. At that time they may weigh from two to twelve pounds or more.

This DPS is known to spawn within the headwaters of the San Joaquin River drainage (Moyle 2002). Because this species uses habitats within the San Joaquin River upstream of the Project area, juveniles and adults must migrate through waters of the Project area when migrating to or from natal streams. Given the location of the Project area along the migration route, this species has a high potential to occur during those migratory periods.

Central Valley Spring Run Chinook Salmon ESU

The Central Valley Spring-run ESU includes all naturally spawned spring-run populations from the Sacramento-San Joaquin River mainstem and its tributaries. Chinook salmon are anadromous (adults migrate from a marine environment into the freshwater streams and rivers of their birth) and semelparous (spawn only once and then die). Spring-run chinook salmon enter the Sacramento River between February and June. They move upstream and enter tributary streams from February through July, peaking in May-June. These fish migrate into the headwaters, hold in pools until they spawn, starting as early as mid-August and ending in mid-October, peaking in September. They are fairly faithful to the home streams in which they were spawned, using visual and chemical cues to locate these streams. While migrating and holding in the river, spring chinook do not feed, relying instead on stored body fat reserves for maintenance and gonadal maturation. Eggs are laid in large depressions (redds) hollowed out in gravel beds. Some fish remain in the stream until the following October and emigrate as "yearlings", usually with the onset of storms starting in October through the following March, peaking in November-December. Large pools with cold water are essential over-summering habitat for this species.

Populations of this species are extant only in the Sacramento River (Moyle 2002). However, the Project area is located near the confluence of the Sacramento and San Joaquin Rivers and multiple waterways connect the Sacramento and San Joaquin both upstream and downstream of the Project area. As such, the species is likely to migrate through waters of the Project area when migrating downstream as juveniles or upstream as adults. Therefore, while no spawning habitat is present, the species is likely to be present seasonally during migration periods and has a high potential to occur.

Central Valley fall/ late fall-run Chinook Salmon ESU

The Central Valley Fall/late fall-run ESU includes all naturally spawned spring-run populations from the Sacramento San Joaquin River mainstem and its tributaries. Late-fall run Chinook salmon are morphologically similar to spring-run chinook. They are large salmonids, reaching 75-100 cm standard length (SL) and weighing up to 9-10 kilograms (kg) or more. The great majority of late-fall Chinook salmon appear to spawn in the mainstem of the Sacramento River, which they enter from October through February. Spawning occurs in January, February and March, although it may extend into April in some years. Eggs are laid in large depressions (redds) hollowed out in gravel beds. The embryos hatch following a 3-4 month incubation period and the alevins (sac-fry) remain in the gravel for another 2-3 weeks. Once their yolk sac is absorbed, the fry emerge and begin feeding on aquatic insects. All fry emerge by early June. The juveniles hold in the river for nearly a year before moving out to sea the following December through March. Once in the ocean, salmon are largely piscivorous and grow rapidly. The specific habitat requirements of late-fall chinook have not been determined, but they are presumably similar to other Chinook salmon runs and fall within the range of the physical and chemical characteristics of the Sacramento River above Red Bluff.

Fall-run Chinook salmon are the sole species of salmon still found in the San Joaquin River drainage (Moyle 2002). Because this species uses habitats within the San Joaquin River upstream of the Project area, juveniles and adults must migrate through waters of the Project area when migrating to or from natal streams. Given the location of the Project area along the migration route, this species has a high potential to occur during those migratory times.

Sacramento River Winter Run Chinook Salmon ESU

The winter-run Chinook salmon ESU includes winter-run Chinook salmon spawning naturally in the Sacramento River and its tributaries, as well as winter-run Chinook salmon that are part of the conservation hatchery program at the Livingston Stone National Fish Hatchery (70 FR 37160) (NMFS 2014). As with other species of Chinook salmon, habitat requirements are similar for each life stage and a primary ecological difference between winter-run Chinook and other ESUs is the timing of migration. Winter-run Chinook enter the Sacramento River as sexually mature fishes between November and June. Spawning occurs shortly afterwards, generally between late-April and mid- August, with the majority of activity occurring between May and June (Myers et al 1998). As a result of spawning during the hot summer months, these salmon are limited in available habitat and require stream reaches with cold water sources that will protect embryos and juveniles from the warm conditions (NMFS 2014). Once hatched, juveniles rear in freshwater for five to nine months before migrating to sea (Myers et. al. 1998).

Historically, winter-run populations existed in the Upper Sacramento, Pit, McCloud, and Calaveras Rivers (Myers et. al. 1998). Following the construction of a series of dams on the San Joaquin River, as well as Shasta Dam, most of the species historical spawning habitat was lost. Construction of these dams resulted in the extirpation of this species from the San Joaquin River and limited the Sacramento population to areas below Shasta Dam (Myers et. al. 1998). Currently winter-run Chinook salmon are primarily restricted to spawning within the mainstem Sacramento River below Shasta Dam (NMFS 2014).

Populations of this species are extant only in the Sacramento River (Myers et al 1998). However, the Project area is located near the confluence of the Sacramento and San Joaquin Rivers and multiple waterways connect the Sacramento and San Joaquin upstream and downstream of the Project area. As such, the species is likely to migrate through waters of the Project area when migrating downstream as juveniles or upstream as adults. Therefore, while no spawning habitat is present, the species is likely to be present seasonally during migration periods and has a high potential to occur.

Sacramento Splittail

Splittail are primarily freshwater fish that have been found mostly in slow-moving sections of rivers and sloughs, and in the Delta and Suisun Marsh they seemed to congregate in dead-end sloughs (Moyle et. al. 1982, Daniels and Moyle 1983). Splittail are benthic foragers that feed extensively on opossum shrimp (*Neomysis mercedis*). However, detrital material typically makes up a high percentage of their stomach contents. They will feed opportunistically on earthworms, clams, insect larvae, and other invertebrates. They are preyed upon by striped bass and other predatory fishes. Splittail apparently require flooded vegetation for spawning and as foraging areas for young, hence they are found in habitat subject to periodic flooding during the breeding season (Caywood 1974).

This species has been observed in habitats upstream and downstream of the Project area (Pisces 2021). While typical slough habitat is not present within the Project area, the species is likely to migrate through the surrounding waters as it travels between populations at various times of the year. Because the species has been observed upstream and downstream of the Project area, but typical slough habitat is not present, this species only has a moderate potential to occur, as it is only likely to occur as a migrant.

Sacramento Perch

Sacramento perch is endemic to California, known from 28 localities in the Central Valley, the Pajaro and Salinas rivers, tributaries to the San Francisco Estuary, and Clear Lake at mostly low elevations (Moyle 2002). It is most likely extirpated from its native range but has been extensively translocated (Crain and Moyle 2011). It is the only native member of the Centrarchidae family found within the Sacramento-San Joaquin River system (Crain and Moyle 2011). Once one of the dominant piscivorous fish in the Sacramento and San Joaquin rivers, it occupied sloughs, slow moving rivers, large lakes and floodplains (Moyle 2002). It prefers warm water and cover in the form of submerged aquatic vegetation, woody debris, and boulders for protection and ambushing prey. Although tolerant of both high alkalinity and salinity, Sacramento perch are not dependent on estuarine habitat as are Sacramento splittail and Delta smelt. Sacramento perch reproduce at two to three years of age, spawning among aquatic plants and in shallow depressions. Spawning occurs from March through early August. Adults reach 61 cm in length and may weigh up to 3.6 kg.

A single record of the species was documented in CNDDB from the 1980's approximately 0.7 mile east of the Project area (CDFW 2021a). Current literature and records indicate that this species has been extirpated throughout most of its historic range, and is now rare within the waters of the Sacramento or San Joaquin Rivers (UC ANR 2021). While this species has been almost entirely extirpated from its native range, the species still has potential to be found in the vicinity, and therefore has a moderate potential to occur.

Longfin Smelt

Longfin Smelt is a pelagic, estuarine fish that ranges from Monterey Bay northward to Hinchinbrook Island, Prince William Sound Alaska. As this species matures in the fall, adults found throughout the San Francisco Bay migrate to brackish or freshwater in Suisun Bay, Montezuma Slough, and the lower reaches of the Sacramento and San Joaquin Rivers. Spawning is believed to take place in freshwater. In April and May, juveniles are believed to migrate downstream to San Pablo Bay. Juveniles tend to inhabit the middle and lower portions of the water column. This species tends to be abundant near freshwater outflow, where higher-quality nursery habitat occurs and potential feeding opportunities are greater.

CDFW monitors various life stages for this species with sampling locations in waters surrounding the Project area (CDFW 2021g). This species has been detected at sampling locations upstream and downstream of the Project area (CDFW 2021g). Because this species is regularly detected at sites surrounding the Project area, it has a high potential to occur within waters of the Project area.

5.2.2 Marine Mammals

Pacific Harbor Seal

Harbor seals are fairly common, non-migratory pinnipeds inhabiting coastal and estuarine waters from Alaska to Baja California, Mexico. They are a year-round resident in the San Francisco Bay Area (Kopec 1999). They haul out on rocks, reefs, and beaches, and feed in marine, estuarine, and occasionally fresh waters (National Marine Mammal Laboratory 2021).

This widespread true seal is commonly found throughout much of San Francisco Bay. Harbor Seals use open water for feeding and travelling, and terrestrial substrates adjacent to water for hauling out (resting). A haul-out site is generally considered a rookery if there are pups present at the site. Harbor seals in San Francisco Bay also tend strongly towards use of established haul-out areas, as opposed to hauling out in new areas (Kopec 1999). Bair Island also contains known haul-out and rookery sites.

This species has been observed infrequently swimming up the San Joaquin River typically following salmon migrations. No barriers exist downstream of the Project area to prevent animals in San Pablo Bay from foraging up the San Joaquin River and through the Project area. The steep rip rap covered banks and lack of low docks eliminate potential use of the Project area as a haul-out location. Therefore, the species has a moderate potential to be observed swimming through, or foraging in open waters around the Project area.

California Sea Lion

California sea lions are found from Vancouver Island, British Columbia to the southern tip of Baja California in Mexico. They breed mainly on offshore islands, ranging from southern California's Channel Islands south to Mexico, although a few pups have been born on Año Nuevo and the Farallon Islands on the central Californian coast (The

Marine Mammal Center [TMMC] 2021). Sandy beaches are preferred for haul-out sites, although in California they haul-out on marina docks as well as jetties and buoys (TMMC 2021).

This species has been documented by the USFWS swimming up the San Joaquin River in the vicinity of the Project area (USFWS 2014). No low boat docks, floating structures, or suitable sandy beach habitat is present to support haul-outs for the species. Because this species has been observed in the area, but does not permanently occupy the area, this species has a moderate potential to occur within open waters of the Project area.

5.2.3 Migratory Birds

The Project area does not provide suitable nesting habitat for special-status birds or raptors; however, trees, shrubs, and wharf structures within the Project area could provide suitable nesting habitat for other migratory birds protected under the Migratory Bird Treaty Act (MBTA) or California FGC. Removal of trees or structures during the typical nesting season (February 15 through September 15) could have an impact to nesting migratory birds and would require preconstruction nesting bird surveys prior to the start of construction.

6.0 CONSTRAINTS ANALYSIS

This section lists recommended CEQA mitigation measures for impacts to potential waters of the U.S., special-status animal species, and migratory birds, as well as federal and state regulations and permits that are applicable to the Project.

6.1 RECOMMENDED MITIGATION MEASURES

<u>Mitigation Measure BIO-1: Fill Below the Water Line and Shading of Open Waters of the San Joaquin River</u>

The Project will mitigate for the lost aquatic resource function resulting from permanent fill consisting of new piles and shading of open waters in the San Joaquin River by purchasing shallow freshwater habitat credits from an agency-approved mitigation or conservation bank at a ratio of no less than 1:1. With the implementation of Mitigation Measure BIO-1, adverse effects due to permanent fill and shading of open waters in the San Joaquin River will be mitigated to less than significant.

<u>Mitigation Measure BIO-2: Fish – Pile Driving</u>

Prior to initiation of construction, the Project Applicant will consult with regulatory agencies with jurisdiction over the Project activities, such as CDFW, NMFS, and USFWS to obtain appropriate permits, recommendations for mitigation measures and habitat mitigation recommendations for Project impacts. This series of consultations will provide a comprehensive list of measures, which will be required to be implemented by the Project. Any such measures will be incorporated into the Project, but at minimum, the following measures will be implemented during the driving of all piles:

- Pile driving will be limited to the period between July 1 and November 1 for concrete and high density polyethylene (HDPE) piles, and from August 1 and November 30 for steel piles.
- A Worker Environmental Awareness Program will be developed which will inform project personnel about the ecology, and protection of special-status species, as well as any Project specific measures to be implemented for the protection of aquatic species.
- A spill prevention and control plan will be developed in advance of the Project initiation.
- Spill kits will be on hand for all work.
- Any equipment used will be maintained to be free of any leaks that might release toxic substances (I.e. fuel, oil or hydraulic fluid).
- Any wildlife encountered within the work area will be allowed to leave the area unharmed.

The following measures will also be included for times when work involves driving steel piles:

- To the extent feasible, pile driving for steel piles will be conducted with a vibratory hammer.
- When installation with an impact hammer is required for steel piles, the following additional measures will be employed:

- Underwater sound monitoring will be performed during pile driving activities, according to the details of a sound attenuation and monitoring plan accepted by the regulatory agencies.
- Use of a bubble curtain.
- Use of a slow start (gradually increasing energy and frequency).
- A biological monitor will be present to observe for marine mammals within 500 meters of the Project area, which is the safety zone established around the work area based on estimates of the potential hydroacoustic effects of pile driving. If the monitor observes a marine mammal within the 500 meter disturbance zone, they will direct work to halt until the animal has left the area on its own and passed beyond the zone of influence for acoustic impacts.

The following measures will also be included for general water quality:

- No debris, rubbish, creosote-treated wood, soil, silt, sand, cement, concrete, or washings thereof, or other construction-related materials or wastes, oil, or petroleum products would be allowed to enter into or placed where it would be subject to erosion by rain, wind, or waves and enter into jurisdictional waters.
- Protective measures would be utilized to prevent accidental discharges to waters during fueling, cleaning, and maintenance.
- Floating booms would be used to contain debris discharged into waters and any debris shall be removed as soon as possible, and no later than the end of each workday.
- Machinery or construction materials not essential for project improvements would not be allowed at any time in the intertidal zone. The construction contractors would be responsible for checking daily tide and current reports.
- A spill contingency plan for hazardous waste would be prepared.

With the implementation of Mitigation Measure BIO-2, it is anticipated that effects to fish from pile driving will be reduced to less than significant levels.

<u>Mitigation Measure BIO-3: Marine Mammals – Pile Driving</u>

Driving of piles with a vibratory hammer, or driving concrete piles is not likely to create sounds capable of causing post-traumatic stress to marine mammals.

To prevent impacts to marine mammals during the driving of steel piles which require use of an impact hammer, a biological monitor will be present to observe for marine mammals within 500 meters of the Project area, which is the safety zone established around the work area based on pile driving estimates. If the monitor observes a marine mammal within the 500-meter disturbance zone, they will direct work to halt until the animal has left the area on its own and passed beyond the zone of influence for acoustic impacts or 15 minutes has elapsed since the last sighting.

With the implementation of Mitigation Measure BIO-3, adverse effects to marine mammals by pile driving will be reduced to less than significant.

Mitigation Measure BIO-4: Migratory Nesting Birds

If initial construction activities commence during the nesting season (February 15 through September 15) a survey for active bird nests will be conducted by a qualified biologist no more than 5 days prior to the start of Project activities. The survey will be conducted to the extent feasible for all areas within 250 feet around the Project area in order to identify the location and status of any nests that could potentially be directly or indirectly affected by construction activities.

- If active nests of MBTA or FGC protected species are found within the Project area or close enough to the area to affect nesting success, a work exclusion zone will be established around each nest. Established exclusion zones will remain in place until all young in the nest have fledged or the nest otherwise becomes inactive (e.g. due to predation). Appropriate exclusion zone sizes vary dependent upon bird species, nest location, existing visual buffers, ambient sound levels, and other factors; an exclusion zone radius may be as small as 25 feet (for common, disturbance-adapted species) or as large as 250 feet or more for raptors.
- Exclusion zone size may also be reduced from established levels if supported by nest monitoring by a qualified biologist indicating that work activities are not adversely impacting the nest.

With the implementation of Mitigation Measure BIO-4, adverse effects to MBTA and FGC protected nesting birds will be mitigated to less than significant.

6.2 FEDERAL AND STATE REGULATIONS AND PERMITS

The following federal regulatory requirements and laws apply to the Project:

- Federal Endangered Species Act (FESA) (16 U.S.C. § 1531); Section 7 Consultation with USFWS and NMFS will be required for in-water work.
- Clean Water Act (CWA), Section 404 (U.S.C. § 1344)
- Rivers and Harbors Act of 1899 (RHA), Section 10 (33U.S.C. § 401 et seq.)
- Migratory Bird Treaty Act (MBTA) (16 U.S.C. §§ 703-712)
- Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. §§ 1801-1884)
- Marine Mammal Protection Act (16 U.S.C. §§ 361–1362, 1371-1389, 1401-1407, 1411- 1418, 1421-1421H, 1423-1423H)

The following state regulatory requirements and laws apply to the Project:

- CEQA (Public Resources Code, Division 13 § 21000 et seq.)
- California Endangered Species Act of 1984 (CESA) Fish and Game Code [F.G.C.] § 2050 et seq.
- CWA, Section 401 (33 U.S.C. § 1341)
- Protection of Migratory Birds (F.G.C. §§ 3503 and 3800)

The following federal permits may be required for this Project:

- USACE Section 404 Nationwide Permit

The following state permits may be required for this Project:

- RWQCB Section 401 Water Quality Certification
- CDFW Section 1602 Lake or Streambed Alteration Agreement
- CDFW Section 2081 Incidental Take Permit

7.0 REFERENCES

Baldwin, B. G., D. H. Goldman, D. J. Keil, R. Patterson, T. J. Rosatti, and D. H. Wilken, eds. 2012. The Jepson Manual: Vascular Plants of California. 2nd edition. University of California Press. Berkeley, California.

California Department of Fish and Wildlife (CDFW). 2014. California Wildlife Habitat Relationships (CWHR), Version 9.0 (personal computer program). California Department of Fish and Wildlife, California Interagency Wildlife Task Group. < https://www.wildlife.ca.gov/data/cwhr> Accessed March 2021.

CDFW. 2021a. Rarefind 5. California Natural Diversity Database (CNDDB). California Natural Communities List. Biogeographic Data Branch, California Department of Fish and Wildlife. < https://www.wildlife.ca.gov/Data/CNDDB/Maps-and-Data> Accessed March 2021.

CDFW. 2021b. Special Animals List. CDFW, CNDDB. Periodic Publication. 66 pp. Updated August 2018. <https://www.wildlife.ca.gov/Data/CNDDB/Plants-and-Animals>. Accessed March 2021.

CDFW. 2021c. State and Federally Listed Endangered and Threatened Animals of California. CDFW, Biogeographic Data Branch, CNDDB. Updated August 2019. <https://www.wildlife.ca.gov/Data/CNDDB/Plants-and-Animals>. Accessed March 2021.

CDFW. 2021d. State and Federally Listed Endangered, Threatened and Rare Plants of California. California Department of Fish and Wildlife, Biogeographic Data Branch, CNDDB. Updated October 2019. <https://www.wildlife.ca.gov/Data/CNDDB/Plants-and-Animals>. Accessed March 2021.

CDFW 2021e. Special Vascular Plants, Bryophytes, and Lichens List. CDFW, CNDDB. Periodic Publication. 127 pp. Updated October 2019. <https://www.wildlife.ca.gov/Data/CNDDB/Plants-and-Animals>. Accessed March 2021.

CDFW. 2021f. California Natural Communities List. Biogeographic Data Branch, California Department of Fish and Wildlife. < https://www.wildlife.ca.gov/Data/VegCAMP/Natural-Communities> Accessed March 2021.

CDFW. 2021g. California Department of Fish and Wildlife Studies: Smelt Larval Survey. <https://www.wildlife.ca.gov/Conservation/Delta/Smelt-Larva-Survey>. Accessed April 2021.

California Invasive Species Council (Cal-IPC). 2006. California Invasive Plant Inventory. Cal-IPC Publication 2006-02. Cal-IPC: Berkeley, California. <www.cal-ipc.org). Accessed May 2021.

Cal-IPC. 2021. California Invasive Plant Inventory. Cal-IPC Inventory Online. Cal-IPC: Berkeley, CA. <www.cal-ipc.org>. Accessed May 2021.

Calflora. 2021. Information on wild California plants. <https://www.calflora.org//>. Accessed March 2021.

California Native Plant Society (CNPS). 2021a. Inventory of Rare And Endangered Plants (Online Edition, V8-02). Sacramento, California. <http://www.rareplants.cnps.org>. Accessed March 2021.

Caywood, M.L. 1974. Contributions to the life history of the splittail *Pogonichthys macrolepidotus* (Ayres). M.S. Thesis. California State University, Sacramento. 77 pp.

CNPS. 2021b. A Manual of California Vegetation Online. <https://vegetation.cnps.org/>. Accessed March 2021.

Crain, P.K. and Moyle, P.B., 2011. Biology, history, status and conservation of Sacramento perch, *Archoplites interruptus*. San Francisco Estuary and Watershed Science, 9(1).

Daniels, R.A. and P.B. Moyle. 1983. Life history of splittail (*Cyprinidae: Pogonichthys macrolepidotus*) in the Sacramento-San Joaquin estuary. Fish. Bull. 84:105-117.

Emmett, R.L., S.L. Stone, S.A. Hinton, and M.E. Monaco. 1991. Distribution and abundance of fishes and invertebrates in West Coast estuaries, volume II. Species life history summaries. NOAA-NOS Strategic Environmental Assessments Division, ELMR Report Number 8, Rockville, Maryland.

Environmental Protection Information Center, Center for Biological Diversity, and Waterkeepers Northern California. 2001. Petition to list the North American green sturgeon (*Acipenser medirostris*) as an endangered or threatened species under the endangered species act. National Marine Fisheries Service.

Google Earth. 2021. Map showing the Project area. Google Earth, 2021. <earth.google.com/web/>. Accessed March 2021.

Jeffres, C.A., A.P. Klimley, J.E. Merz, and J.J. Cech. 2006. Movement of Sacramento sucker, *Catostomus occidentalis*, and hitch, *Lavinia exilicauda*, during a spring release of water from Camanche Dam in the Mokelumne River, California. Environmental Biology of Fishes 75:365-373.

Kopec, Diane. 1999. Harbor Seals in the Bay. Tideline Vol 19 No. 1 1-3.

Mayer, K.E., and W.F. Laudenslayer, Jr., eds. 1988. A Guide to Wildlife Habitats Of California. Sacramento: California Department of Forestry and Fire Protection (CAL FIRE).

Moyle, P.B., J.J. Smith, R.A. Daniels, and D.M. Baltz. 1982. Distribution and ecology of stream fishes of the Sacramento-San Joaquin Drainage System, California: a review. University of Calif. Publ. Zool. 115:225-256.

Moyle, P.B., P.J. Foley, and R.M. Yoshiyama. 1992. Status of green sturgeon, *Acipensermedirostris*, in California. Final Report submitted to National Marine Fisheries Service. 11 p. University of California, Davis, CA 95616.

Moyle, P.B. 2002. Inland Fishes of California. University of California Press, Berkeley, California.

Moyle, P.B., R. M. Quiñones, J. V. Katz and J. Weaver. 2015. Fish Species of Special Concern in California. Sacramento: California Department of Fish and Wildlife. <www.wildlife.ca.gov>. Accessed April 2021.

Myers, J.M., Kope, R.G., Bryant, G.J., Teel, D., Lierheimer, L.J., Wainwright, T.C., Grant, W.S., Waknitz, F.W., Neely, K., Lindley, S.T. and Waples, R.S., 1998. Status review of Chinook salmon from Washington, Idaho, Oregon, and California. NOAA Technical Memorandum NMFS-NWFSC, 35, p.443.

National Marine Fisheries Service (NMFS). 2014. Recovery Plan for the Evolutionarily Significant Units of Sacramento River Winter-run Chinook Salmon and Central Valley Spring-run Chinook Salmon and the Distinct Population Segment of California Central Valley Steelhead. California Central Valley Area Office. July 2014.

NMFS. 2016. California Species List Tool. West Coast Region. <https://archive.fisheries.noaa.gov/wcr/maps_data/california_species_list_tools.html>. Accessed March 2021.

National Marine Mammal Laboratory. 2021. NOAA Fisheries Alaska Science Center, Marine Mammal Laboratory. Species Profile. <https://www.afsc.noaa.gov/nmml/species/species_harbor.php>. Accessed May 2021.

Natural Resources Conservation Service (NRCS). 2021. AgACIS Climate Data for Antioch Pumping Plant #3. National Water and Climate Center. <http://agacis.rcc-acis.org/?fips=06013>. Accessed March 2021.

Pisces. 2021. Pisces Database website. <https://pisces.ucdavis.edu/fish>. Accessed May 2021.

Sawyer, J. O., T. Keeler-Wolf, and J. M. Evans. 2009. A Manual of California Vegetation, 2nd Edition. CNPS, Sacramento, California.

Sommer, T. and Mejia, F. 2013. A place to call home: a synthesis of Delta Smelt habitat in the upper San Francisco Estuary. San Francisco Estuary and Watershed Science, 11(2).

Spencer, W.D., P. Beier, K. Penrod, K. Winters, C. Paulman, H. Rustigian-Romsos, J. Strittholt, M. Parisi, and A. Pettler. 2010. California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California. Prepared for California Department of Transportation, California Department of Fish and Game, and Federal Highways Administration.

The Marine Mammal Center. 2021. Marine Mammal Information. <http://www.marinemammalcenter.org>. Accessed May 2021.

U.S. Fish and Wildlife Service (USFWS). 2014. San Joaquin River NWR: Young California Sea Lion visits the San Joaquin River NWR. <https://www.fws.gov/fieldnotes/regmap.cfm?arskey=34792>. Accessed May 2021.

USFWS. 2021a. Trust Resources Report. Information for Planning and Consultation (IPaC). <https://ecos.fws.gov/ipac/>. Accessed March 2021.

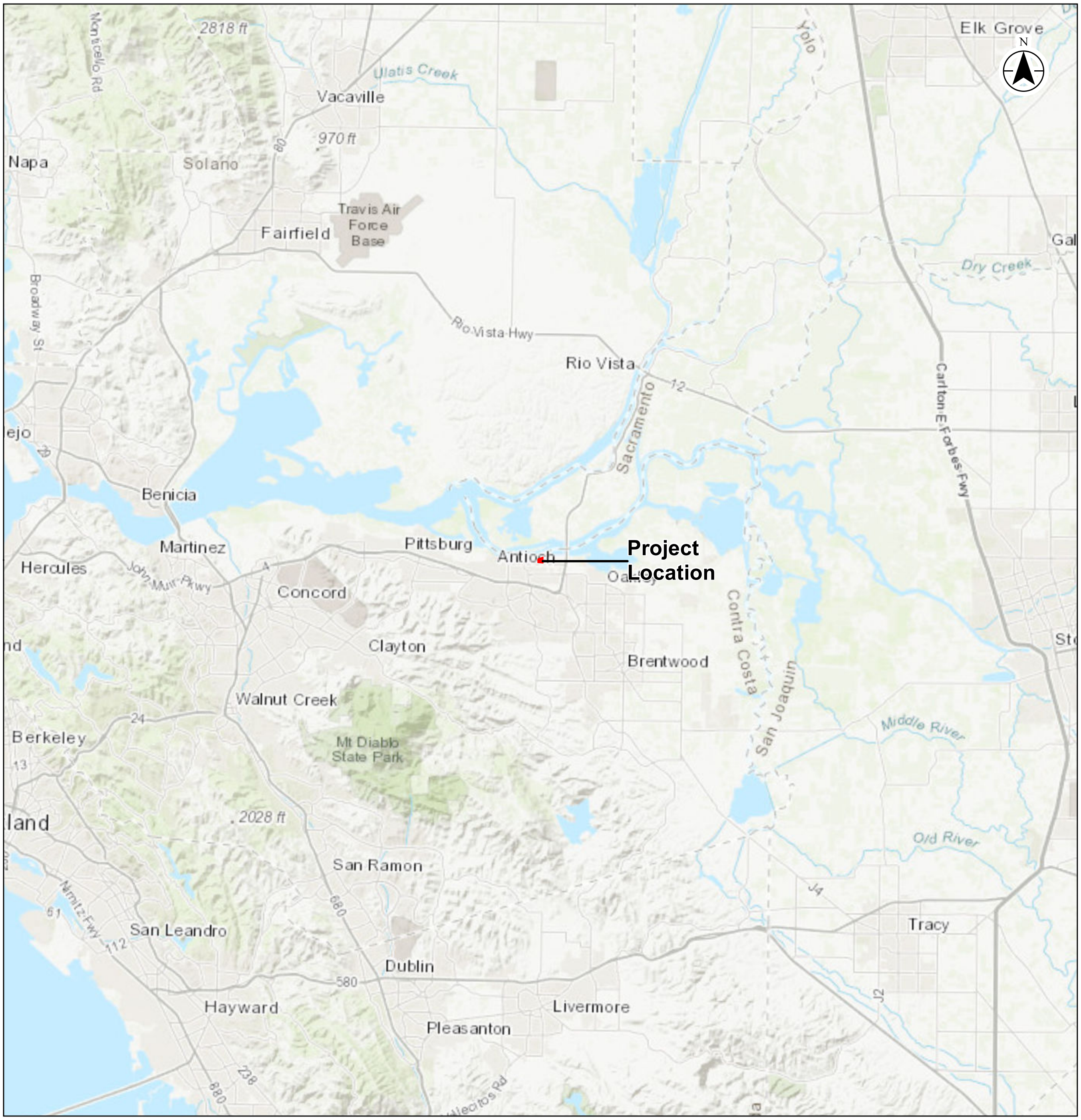
USFWS. 2020b. USFWS National Wetlands Inventory (NWI). < https://www.fws.gov/wetlands/>. Accessed March 2021.

University of California Agriculture and Natural Resources. 2021. California Fish Website. <http://calfish.ucdavis.edu/>. Accessed March 2021.

Western Regional Climate Center. 2021. Antioch Pump Plant 3, California (ID 040232), 1955 to 2016. National Oceanic and Atmospheric Administration Coop Stations. <https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca9219>. Accessed March 2021.

APPENDIX A

Figures



0 5 10 Miles

1:500,000 (at original document size of 8.5x11)

Stantec

Project Location
Antioch, California

Prepared by TM on 2021-03-16

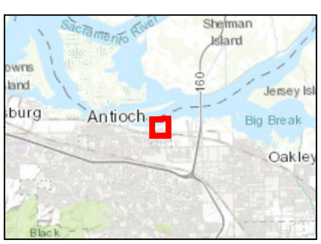
Client/Project
City of Antioch
Amports Antioch Vehicle Processing Facility Project

Figure No.
1

Title
Regional Overview

Notes
1. Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
2. Base Map: Esri World Topographic Map web mapping service

U:\185705365\03_data\gis_cad\gis\mxds\185705365_figure_1_Regional_Overview.mxd Revised: 2021-03-16 By: tmooney



Project Site

0 200 400
Feet
1:4,800 (at original document size of 8.5x11)

Notes
1. Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
2. Base Map: Esri World Imagery web mapping service

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

Stantec

Project Location
Antioch, California

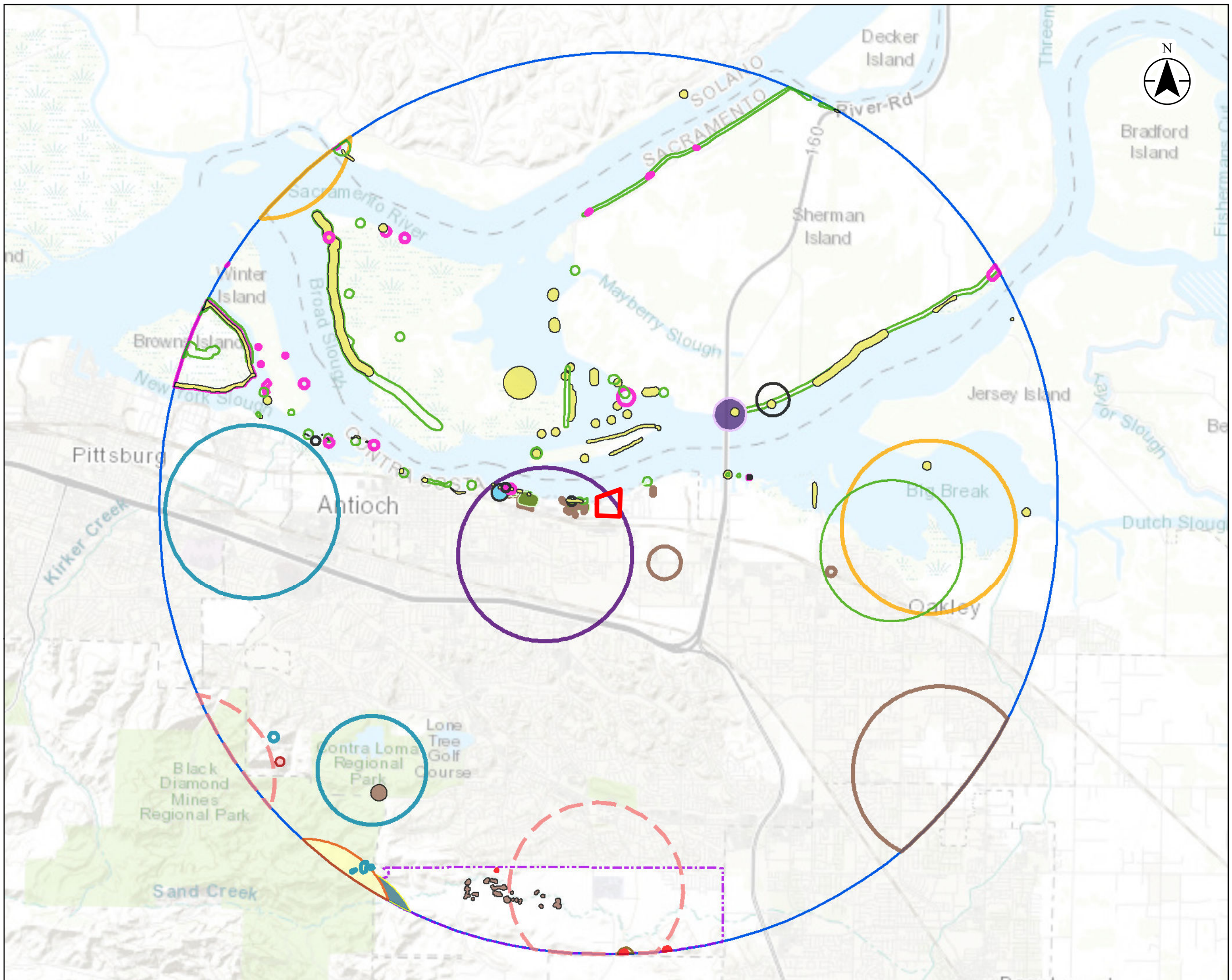
Prepared by TM on 2021-03-16

Client/Project
City of Antioch
Amports Antioch Vehicle Processing Facility Project

Figure No.
2

Title
Project Site Location

U:\185705365\03_data\gis_cad\gis\mxds\185705365_figure_2_Project_Site_Location.mxd Revised: 2021-03-16 By: tmooney



- Antioch Dunes buckwheat, Eriogonum nudum var. psychicola
- Antioch Dunes evening-primrose, Oenothera deltoides ssp. howellii
- Bolander's water-hemlock, Cicuta maculata var. bolanderi
- Brewer's western flax, Hesperolinon breweri
- Contra Costa wallflower, Erysimum capitatum var. angustatum
- Delta mudwort, Limosella australis
- Delta tule pea, Lathyrus jepsonii var. jepsonii
- Hoover's cryptantha, Cryptantha hooveri
- Mason's lilaeopsis, Lilaeopsis masonii
- Mt. Diablo buckwheat, Eriogonum truncatum
- Mt. Diablo manzanita, Arctostaphylos auriculata
- San Joaquin spearscale, Extriplex joaquinana
- Suisun Marsh aster, Symphyotrichum lentum
- big tarplant, Blepharizonia plumosa
- brittlescale, Atriplex depressa
- large-flowered fiddleneck, Amsinckia grandiflora
- shining navarretia, Navarretia nigelliformis ssp. radians
- showy golden madia, Madia radiata
- soft salty bird's-beak, Chloropyron molle ssp. molle

- Project Site
- Project Site 5-mile Buffer

0 1 2 Miles

1 inch = 2 miles (at original document size of 8.5x11)

Notes

1. Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
2. Base Map: Esri World Topographic Map web mapping service

Stantec

Project Location
Antioch, California

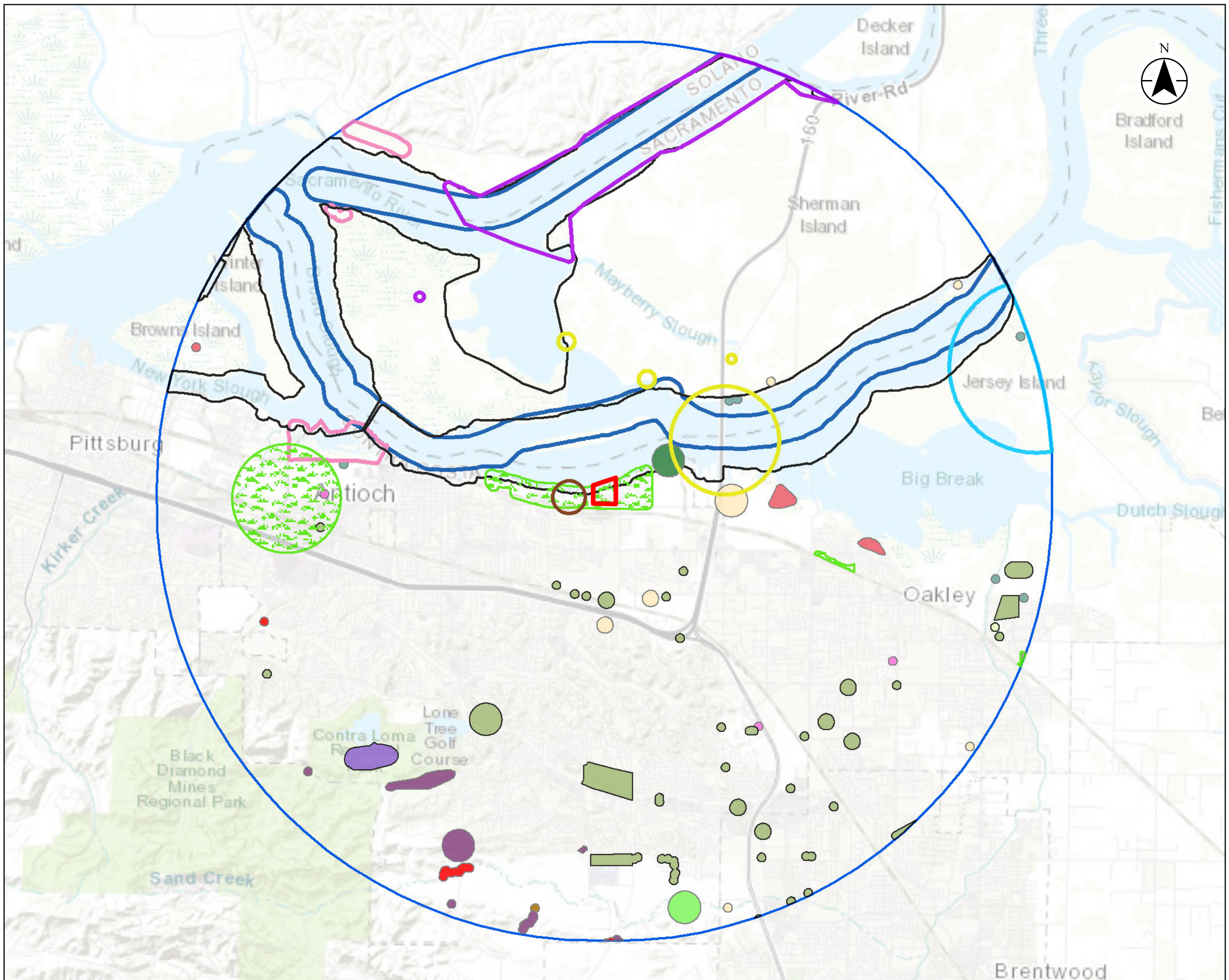
Prepared by TM on 2021-05-07

Client/Project
City of Antioch
Amports Antioch Vehicle Processing Facility Project

Figure No.
3

Title
CNDDB Special-Status Plant Occurrences

U:_tm\185705365_Antioch_Amports\03_data\gis_cad\gis\mxds\185705365_figure_1_cnddb_plants.mxd Revised: 2021-05-07 By: tmooney



American badger, Taxidea taxus	burrowing owl, Athene cunicularia
California black rail, Laterallus jamaicensis coturniculus	giant gartersnake, Thamnophis gigas
California glossy snake, Arizona elegans occidentalis	loggerhead shrike, Lanius ludovicianus
California red-legged frog, Rana draytonii	longfin smelt, Spirinchus thaleichthys
California tiger salamander, Ambystoma californiense	salt-marsh harvest mouse, Reithrodontomys raviventris
Delta smelt, Hypomesus transpacificus	song sparrow ("Modesto" population), Melospiza melodia
Northern California legless lizard, Anniella pulchra	steelhead - Central Valley DPS, Oncorhynchus mykiss irideus pop. 11
Sacramento perch, Archoplites interruptus	vernal pool fairy shrimp, Branchinecta lynchi
San Joaquin kit fox, Vulpes macrotis mutica	western pond turtle, Emys marmorata
Swainson's hawk, Buteo swainsoni	white-tailed kite, Elanus leucurus

Project Site

Project Site 5-mile Buffer

0 1 2 Miles

1 inch = 2 miles (at original document size of 8.5x11)

Stantec

Project Location
Antioch, California

Prepared by TM on 2021-05-07

Client/Project
City of Antioch
Amports Antioch Vehicle Processing Facility Project

Figure No.
4

Title
CNDDB Special-Status Animal Occurrences

Notes
1. Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
2. Base Map: Esri World Topographic Map web mapping service

U:_tm\185705365_Antioch_Amports\03_data\gis_cad\gis\mxds\185705365_figure_2_cnddb_animals.mxd Revised: 2021-05-07 By: tmooney

APPENDIX B

USFWS, NOAA, CNDDB and CNPS Database Results

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Antioch North (3812117) OR Antioch South (3712187) OR Jersey Island (3812116) OR Brentwood (3712186))
 AND Taxonomic Group IS (Fish OR Amphibians OR Reptiles OR Birds OR Mammals OR Mollusks OR Arachnids OR Crustaceans OR Insects)

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	Threatened	G1G2	S1S2	SSC
Ambystoma californiense California tiger salamander	AAAAA01180	Threatened	Threatened	G2G3	S2S3	WL
Andrena blennospermatis Blennosperma vernal pool andrenid bee	IIHYM35030	None	None	G2	S2	
Anniella pulchra Northern California legless lizard	ARACC01020	None	None	G3	S3	SSC
Anthicus antiochensis Antioch Dunes anthicid beetle	IICOL49020	None	None	G1	S1	
Antrozous pallidus pallid bat	AMACC10010	None	None	G4	S3	SSC
Apodemia mormo langei Lange's metalmark butterfly	IILEPH7012	Endangered	None	G5T1	S1	
Archoplites interruptus Sacramento perch	AFCQB07010	None	None	G2G3	S1	SSC
Ardea herodias great blue heron	ABNGA04010	None	None	G5	S4	
Arizona elegans occidentalis California glossy snake	ARADB01017	None	None	G5T2	S2	SSC
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S3	SSC
Bombus crotchii Crotch bumble bee	IIHYM24480	None	Candidate Endangered	G3G4	S1S2	
Bombus occidentalis western bumble bee	IIHYM24250	None	Candidate Endangered	G2G3	S1	
Branchinecta conservatio Conservancy fairy shrimp	ICBRA03010	Endangered	None	G2	S2	
Branchinecta lynchi vernal pool fairy shrimp	ICBRA03030	Threatened	None	G3	S3	
Branchinecta mesovallensis midvalley fairy shrimp	ICBRA03150	None	None	G2	S2S3	
Buteo swainsoni Swainson's hawk	ABNKC19070	None	Threatened	G5	S3	
Coelus gracilis San Joaquin dune beetle	IICOL4A020	None	None	G1	S1	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Efferia antiochi Antioch efferian robberfly	IIDIP07010	None	None	G1G2	S1S2	
Elanus leucurus white-tailed kite	ABNKC06010	None	None	G5	S3S4	FP
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Eucerceris ruficeps redheaded sphecid wasp	IIHYM18010	None	None	G1G3	S1S2	
Geothlypis trichas sinuosa saltmarsh common yellowthroat	ABPBX1201A	None	None	G5T3	S3	SSC
Gonidea angulata western ridged mussel	IMBIV19010	None	None	G3	S1S2	
Helminthoglypta nickliniana bridgesi Bridges' coast range shoulderband	IMGASC2362	None	None	G3T1	S1S2	
Hygrotus curvipes curved-foot hygrotus diving beetle	IICOL38030	None	None	G1	S1	
Hypomesus transpacificus Delta smelt	AFCHB01040	Threatened	Endangered	G1	S1	
Idiostatus middlekauffi Middlekauff's shieldback katydid	IIORT31010	None	None	G1G2	S1	
Lanius ludovicianus loggerhead shrike	ABPBR01030	None	None	G4	S4	SSC
Lasiurus blossevillii western red bat	AMACC05060	None	None	G4	S3	SSC
Lasiurus cinereus hoary bat	AMACC05030	None	None	G3G4	S4	
Laterallus jamaicensis coturniculus California black rail	ABNME03041	None	Threatened	G3G4T1	S1	FP
Lepidurus packardi vernal pool tadpole shrimp	ICBRA10010	Endangered	None	G4	S3S4	
Linderiella occidentalis California linderiella	ICBRA06010	None	None	G2G3	S2S3	
Lytta molesta molestan blister beetle	IICOL4C030	None	None	G2	S2	
Masticophis lateralis euryxanthus Alameda whipsnake	ARADB21031	Threatened	Threatened	G4T2	S2	
Melospiza melodia song sparrow ("Modesto" population)	ABPBXA3010	None	None	G5	S3?	SSC
Melospiza melodia maxillaris Suisun song sparrow	ABPBXA301K	None	None	G5T3	S3	SSC
Metapogon hurdi Hurd's metapogon robberfly	IIDIP08010	None	None	G1G2	S1S2	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Myrmosula pacifica Antioch multilid wasp	IIHYM15010	None	None	GH	SH	
Oncorhynchus mykiss irideus pop. 11 steelhead - Central Valley DPS	AFCHA0209K	Threatened	None	G5T2Q	S2	
Perdita scitula antiochensis Antioch andrenid bee	IIHYM01031	None	None	G1T1	S1	
Perognathus inornatus San Joaquin pocket mouse	AMAFD01060	None	None	G2G3	S2S3	
Phalacrocorax auritus double-crested cormorant	ABNFD01020	None	None	G5	S4	WL
Philanthus nasalis Antioch specid wasp	IIHYM20010	None	None	G1	S1	
Rana boylii foothill yellow-legged frog	AAABH01050	None	Endangered	G3	S3	SSC
Rana draytonii California red-legged frog	AAABH01022	Threatened	None	G2G3	S2S3	SSC
Reithrodontomys raviventris salt-marsh harvest mouse	AMAFF02040	Endangered	Endangered	G1G2	S1S2	FP
Riparia riparia bank swallow	ABPAU08010	None	Threatened	G5	S2	
Sphecodogastra antiochensis Antioch Dunes halcitid bee	IIHYM78010	None	None	G1	S1	
Spirinchus thaleichthys longfin smelt	AFCHB03010	Candidate	Threatened	G5	S1	
Taxidea taxus American badger	AMAJF04010	None	None	G5	S3	SSC
Thamnophis gigas giant gartersnake	ARADB36150	Threatened	Threatened	G2	S2	
Vulpes macrotis mutica San Joaquin kit fox	AMAJA03041	Endangered	Threatened	G4T2	S2	

Record Count: 54

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Antioch North (3812117) OR Antioch South (3712187) OR Jersey Island (3812116) OR Brentwood (3712186))
 AND Taxonomic Group IS (Ferns OR Gymnosperms OR Monocots OR Dicots OR Lichens OR Bryophytes)

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Amsinckia grandiflora large-flowered fiddleneck	PDBOR01050	Endangered	Endangered	G1	S1	1B.1
Anomobryum julaceum slender silver moss	NBMUS80010	None	None	G5?	S2	4.2
Arctostaphylos auriculata Mt. Diablo manzanita	PDERI04040	None	None	G2	S2	1B.3
Astragalus tener var. tener alkali milk-vetch	PDFAB0F8R1	None	None	G2T1	S1	1B.2
Atriplex depressa brittlescale	PDCHE042L0	None	None	G2	S2	1B.2
Blepharizonia plumosa big tarplant	PDAST1C011	None	None	G1G2	S1S2	1B.1
Calochortus pulchellus Mt. Diablo fairy-lantern	PMLIL0D160	None	None	G2	S2	1B.2
Centromadia parryi ssp. congdonii Congdon's tarplant	PDAST4R0P1	None	None	G3T1T2	S1S2	1B.1
Chloropyron molle ssp. molle soft salty bird's-beak	PDSCR0J0D2	Endangered	Rare	G2T1	S1	1B.2
Cicuta maculata var. bolanderi Bolander's water-hemlock	PDAPI0M051	None	None	G5T4T5	S2?	2B.1
Cryptantha hooveri Hoover's cryptantha	PDBOR0A190	None	None	GH	SH	1A
Downingia pusilla dwarf downingia	PDCAM060C0	None	None	GU	S2	2B.2
Eriogonum nudum var. psychicola Antioch Dunes buckwheat	PDPGN0849Q	None	None	G5T1	S1	1B.1
Eriogonum truncatum Mt. Diablo buckwheat	PDPGN085Z0	None	None	G1	S1	1B.1
Eryngium jepsonii Jepson's coyote-thistle	PDAPI0Z130	None	None	G2	S2	1B.2
Erysimum capitatum var. angustatum Contra Costa wallflower	PDBRA16052	Endangered	Endangered	G5T1	S1	1B.1
Eschscholzia rhombipetala diamond-petaled California poppy	PDPAP0A0D0	None	None	G1	S1	1B.1
Extriplex joaquinana San Joaquin spearscale	PDCHE041F3	None	None	G2	S2	1B.2

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Fritillaria agrestis stinkbells	PMLIL0V010	None	None	G3	S3	4.2
Fritillaria liliacea fragrant fritillary	PMLIL0V0C0	None	None	G2	S2	1B.2
Helianthella castanea Diablo helianthella	PDAST4M020	None	None	G2	S2	1B.2
Hesperolinon breweri Brewer's western flax	PDLIN01030	None	None	G2	S2	1B.2
Hibiscus lasiocarpos var. occidentalis woolly rose-mallow	PDMAL0H0R3	None	None	G5T3	S3	1B.2
Lasthenia conjugens Contra Costa goldfields	PDAST5L040	Endangered	None	G1	S1	1B.1
Lathyrus jepsonii var. jepsonii Delta tule pea	PDFAB250D2	None	None	G5T2	S2	1B.2
Lilaeopsis masonii Mason's lilaeopsis	PDAPI19030	None	Rare	G2	S2	1B.1
Limosella australis Delta mudwort	PDSCR10030	None	None	G4G5	S2	2B.1
Madia radiata showy golden madia	PDAST650E0	None	None	G3	S3	1B.1
Malacothamnus hallii Hall's bush-mallow	PDMAL0Q0F0	None	None	G2	S2	1B.2
Navarretia nigelliformis ssp. radians shining navarretia	PDPLM0C0J2	None	None	G4T2	S2	1B.2
Oenothera deltoides ssp. howellii Antioch Dunes evening-primrose	PDONA0C0B4	Endangered	Endangered	G5T1	S1	1B.1
Plagiobothrys hystriculus bearded popcornflower	PDBOR0V0H0	None	None	G2	S2	1B.1
Potamogeton zosteriformis eel-grass pondweed	PMPOT03160	None	None	G5	S3	2B.2
Senecio aphanactis chaparral ragwort	PDAST8H060	None	None	G3	S2	2B.2
Sidalcea keckii Keck's checkerbloom	PDMAL110D0	Endangered	None	G2	S2	1B.1
Symphyotrichum lentum Suisun Marsh aster	PDASTE8470	None	None	G2	S2	1B.2
Tropidocarpum capparideum caper-fruited tropidocarpum	PDBRA2R010	None	None	G1	S1	1B.1
Viburnum ellipticum oval-leaved viburnum	PDCPR07080	None	None	G4G5	S3?	2B.3

Record Count: 38

CNPS California Native Plant Society

Inventory of Rare and Endangered Plants

*The database used to provide updates to the Online Inventory is under construction. View updates and changes made since May 2019 here.

Plant List

38 matches found. *Click on scientific name for details*

Search Criteria

California Rare Plant Rank is one of [1A, 1B, 2A, 2B], Found in Quads 3812117, 3712187 3712186 and 3812116;

Modify Search Criteria Export to Excel Modify Columns Modify Sort Display Photos

Scientific Name	Common Name	Family	Lifeform	Blooming Period	CA Rare Plant Rank	State Rank	Global Rank
Amsinckia grandiflora	large-flowered fiddleneck	Boraginaceae	annual herb	(Mar)Apr-May	1B.1	S1	G1
Arctostaphylos auriculata	Mt. Diablo manzanita	Ericaceae	perennial evergreen shrub	Jan-Mar	1B.3	S2	G2
Arctostaphylos manzanita ssp. laevigata	Contra Costa manzanita	Ericaceae	perennial evergreen shrub	Jan-Mar(Apr)	1B.2	S2	G5T2
Astragalus tener var. tener	alkali milk-vetch	Fabaceae	annual herb	Mar-Jun	1B.2	S1	G2T1
Atriplex cordulata var. cordulata	heartscale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G3T2
Atriplex depressa	brittlescale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G2
Blepharizonia plumosa	big tarplant	Asteraceae	annual herb	Jul-Oct	1B.1	S1S2	G1G2
Calochortus pulchellus	Mt. Diablo fairy-lantern	Liliaceae	perennial bulbiferous herb	Apr-Jun	1B.2	S2	G2
Centromadia parryi ssp. congdonii	Congdon's tarplant	Asteraceae	annual herb	May-Oct(Nov)	1B.1	S1S2	G3T1T2
Chloropyron molle ssp. molle	soft bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	Jun-Nov	1B.2	S1	G2T1
Cicuta maculata var. bolanderi	Bolander's water-hemlock	Apiaceae	perennial herb	Jul-Sep	2B.1	S2?	G5T4T5
Cryptantha hooveri	Hoover's cryptantha	Boraginaceae	annual herb	Apr-May	1A	SH	GH
Downingia pusilla	dwarf downingia	Campanulaceae	annual herb	Mar-May	2B.2	S2	GU
Eriogonum nudum var. psychicola	Antioch Dunes buckwheat	Polygonaceae	perennial herb	Jul-Oct	1B.1	S1	G5T1
Eriogonum truncatum	Mt. Diablo buckwheat	Polygonaceae	annual herb	Apr-Sep(Nov-Dec)	1B.1	S1	G1
Eryngium jepsonii	Jepson's coyote thistle	Apiaceae	perennial herb	Apr-Aug	1B.2	S2?	G2?
Erysimum capitatum var. angustatum	Contra Costa wallflower	Brassicaceae	perennial herb	Mar-Jul	1B.1	S1	G5T1
Eschscholzia rhombipetala	diamond-petaled California poppy	Papaveraceae	annual herb	Mar-Apr	1B.1	S1	G1
Extriplex joaquinana	San Joaquin spearscale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G2
Fritillaria liliacea	fragrant fritillary	Liliaceae	perennial bulbiferous herb	Feb-Apr	1B.2	S2	G2
Helianthella castanea	Diablo helianthella	Asteraceae	perennial herb	Mar-Jun	1B.2	S2	G2
Hesperolinon breweri	Brewer's western flax	Linaceae	annual herb	May-Jul	1B.2	S2	G2
Hibiscus lasiocarpos var. occidentalis	woolly rose-mallow	Malvaceae	perennial rhizomatous herb (emergent)	Jun-Sep	1B.2	S3	G5T3
Isocoma arguta	Carquinez goldenbush	Asteraceae	perennial shrub	Aug-Dec	1B.1	S1	G1
Lasthenia conjugens	Contra Costa goldfields	Asteraceae	annual herb	Mar-Jun	1B.1	S1	G1

Lathyrus jepsonii var. jepsonii	Delta tule pea	Fabaceae	perennial herb	May-Jul(Aug-Sep)	1B.2	S2	G5T2
Lilaeopsis masonii	Mason's lilaeopsis	Apiaceae	perennial rhizomatous herb	Apr-Nov	1B.1	S2	G2
Limosella australis	Delta mudwort	Scrophulariaceae	perennial stoloniferous herb	May-Aug	2B.1	S2	G4G5
Madia radiata	showy golden madia	Asteraceae	annual herb	Mar-May	1B.1	S3	G3
Malacothamnus hallii	Hall's bush-mallow	Malvaceae	perennial evergreen shrub	(Apr)May-Sep(Oct)	1B.2	S2	G2
Navarretia nigelliformis ssp. radians	shining navarretia	Polemoniaceae	annual herb	(Mar)Apr-Jul	1B.2	S2	G4T2
Neostapfia colusana	Colusa grass	Poaceae	annual herb	May-Aug	1B.1	S1	G1
Oenothera deltoides ssp. howellii	Antioch Dunes evening-primrose	Onagraceae	perennial herb	Mar-Sep	1B.1	S1	G5T1
Plagiobothrys hystriculus	bearded popcornflower	Boraginaceae	annual herb	Apr-May	1B.1	S2	G2
Potamogeton zosteriformis	eel-grass pondweed	Potamogetonaceae	annual herb (aquatic)	Jun-Jul	2B.2	S3	G5
Senecio aphanactis	chaparral ragwort	Asteraceae	annual herb	Jan-Apr(May)	2B.2	S2	G3
Symphyotrichum lentum	Suisun Marsh aster	Asteraceae	perennial rhizomatous herb	(Apr)May-Nov	1B.2	S2	G2
Viburnum ellipticum	oval-leaved viburnum	Adoxaceae	perennial deciduous shrub	May-Jun	2B.3	S3?	G4G5

Suggested Citation

California Native Plant Society, Rare Plant Program. 2021. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website http://www.rareplants.cnps.org [accessed 10 March 2021].

United States Department of the Interior

FISH AND WILDLIFE SERVICE
San Francisco Bay-Delta Fish And Wildlife
650 Capitol Mall
Suite 8-300
Sacramento, CA 95814
Phone: (916) 930-5603 Fax: (916) 930-5654
http://kim_squires@fws.gov

In Reply Refer To: March 19, 2021
Consultation Code: 08FBDT00-2021-SLI-0115
Event Code: 08FBDT00-2021-E-00276
Project Name: Amports Antioch Vehicle Processing Facility Project

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

San Francisco Bay-Delta Fish And Wildlife
650 Capitol Mall
Suite 8-300
Sacramento, CA 95814
(916) 930-5603

This project's location is within the jurisdiction of multiple offices. Expect additional species list documents from the following office, and expect that the species and critical habitats in each document reflect only those that fall in the office's jurisdiction:

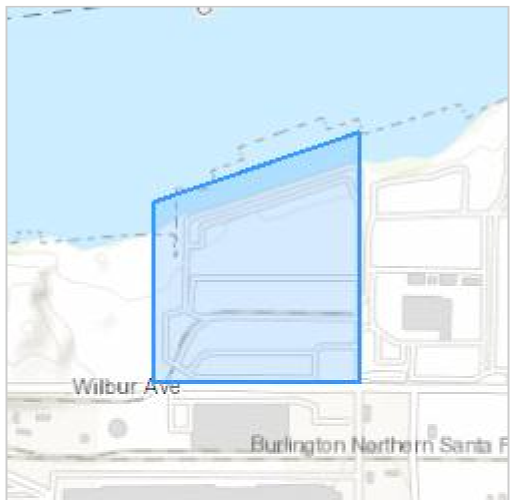
Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

Project Summary

Consultation Code: 08FBDT00-2021-SLI-0115
Event Code: 08FBDT00-2021-E-00276
Project Name: Amports Antioch Vehicle Processing Facility Project
Project Type: DEVELOPMENT
Project Description: AMPORTS is developing an automotive logistics and processing facility in Antioch, California. The site will be used for delivery and storage of vehicles and limited processing prior to distributions to dealerships.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@38.0145666,-121.77602563030568,14z



Counties: Contra Costa County, California

Endangered Species Act Species

There is a total of 20 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Salt Marsh Harvest Mouse *Reithrodontomys raviventris* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/613	Endangered
San Joaquin Kit Fox *Vulpes macrotis mutica* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2873	Endangered

Birds

NAME	STATUS
California Clapper Rail *Rallus longirostris obsoletus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4240	Endangered
California Least Tern *Sterna antillarum browni* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8104	Endangered

Reptiles

NAME	STATUS
Giant Garter Snake *Thamnophis gigas* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4482	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened
California Tiger Salamander *Ambystoma californiense* Population: U.S.A. (Central CA DPS) There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/2076	Threatened

Fishes

NAME	STATUS
Delta Smelt *Hypomesus transpacificus* There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/321	Threatened

Insects

NAME	STATUS
Delta Green Ground Beetle *Elaphrus viridis* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/2319	Threatened
Lange's Metalmark Butterfly *Apodemia mormo langei* There is **proposed** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/4382	Endangered
San Bruno Elfin Butterfly *Callophrys mossii bayensis* There is **proposed** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/3394	Endangered
Valley Elderberry Longhorn Beetle *Desmocerus californicus dimorphus* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/7850	Threatened

Crustaceans

NAME	STATUS
Vernal Pool Fairy Shrimp *Branchinecta lynchi* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/498	Threatened
Vernal Pool Tadpole Shrimp *Lepidurus packardi* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/2246	Endangered

Flowering Plants

NAME	STATUS
Antioch Dunes Evening-primrose *Oenothera deltoides ssp. howellii* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/5970	Endangered
Colusa Grass *Neostapfia colusana* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/5690	Threatened
Contra Costa Goldfields *Lasthenia conjugens* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/7058	Endangered
Contra Costa Wallflower *Erysimum capitatum var. angustatum* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/7601	Endangered
Keck's Checker-mallow *Sidalcea keckii* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/5704	Endangered
Soft Bird's-beak *Cordylanthus mollis ssp. mollis* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/8541	Endangered

Critical habitats

There is 1 critical habitat wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
Delta Smelt *Hypomesus transpacificus* https://ecos.fws.gov/ecp/species/321#crithab	Final

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To: March 19, 2021
Consultation Code: 08ESMF00-2021-SLI-1335
Event Code: 08ESMF00-2021-E-03839
Project Name: Amports Antioch Vehicle Processing Facility Project

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

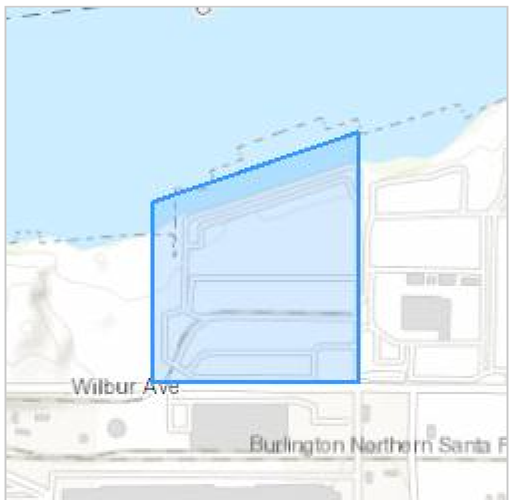
This project's location is within the jurisdiction of multiple offices. Expect additional species list documents from the following office, and expect that the species and critical habitats in each document reflect only those that fall in the office's jurisdiction:

San Francisco Bay-Delta Fish And Wildlife
650 Capitol Mall
Suite 8-300
Sacramento, CA 95814
(916) 930-5603

Project Summary

Consultation Code: 08ESMF00-2021-SLI-1335
Event Code: 08ESMF00-2021-E-03839
Project Name: Amports Antioch Vehicle Processing Facility Project
Project Type: DEVELOPMENT
Project Description: AMPORTS is developing an automotive logistics and processing facility in Antioch, California. The site will be used for delivery and storage of vehicles and limited processing prior to distributions to dealerships.
Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@38.0145666,-121.77602563030568,14z



Counties: Contra Costa County, California

Endangered Species Act Species

There is a total of 20 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Salt Marsh Harvest Mouse *Reithrodontomys raviventris* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/613	Endangered
San Joaquin Kit Fox *Vulpes macrotis mutica* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2873	Endangered

Birds

NAME	STATUS
California Clapper Rail *Rallus longirostris obsoletus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4240	Endangered
California Least Tern *Sterna antillarum browni* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8104	Endangered

Reptiles

NAME	STATUS
Giant Garter Snake *Thamnophis gigas* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4482	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened
California Tiger Salamander *Ambystoma californiense* Population: U.S.A. (Central CA DPS) There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/2076	Threatened

Fishes

NAME	STATUS
Delta Smelt *Hypomesus transpacificus* There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/321	Threatened

Insects

NAME	STATUS
Delta Green Ground Beetle *Elaphrus viridis* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/2319	Threatened
Lange's Metalmark Butterfly *Apodemia mormo langei* There is **proposed** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/4382	Endangered
San Bruno Elfin Butterfly *Callophrys mossii bayensis* There is **proposed** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/3394	Endangered
Valley Elderberry Longhorn Beetle *Desmocerus californicus dimorphus* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/7850	Threatened

Crustaceans

NAME	STATUS
Vernal Pool Fairy Shrimp *Branchinecta lynchi* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/498	Threatened
Vernal Pool Tadpole Shrimp *Lepidurus packardi* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/2246	Endangered

Flowering Plants

NAME	STATUS
Antioch Dunes Evening-primrose *Oenothera deltoides ssp. howellii* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/5970	Endangered
Colusa Grass *Neostapfia colusana* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/5690	Threatened
Contra Costa Goldfields *Lasthenia conjugens* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/7058	Endangered
Contra Costa Wallflower *Erysimum capitatum var. angustatum* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/7601	Endangered
Keck's Checker-mallow *Sidalcea keckii* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/5704	Endangered
Soft Bird's-beak *Cordylanthus mollis ssp. mollis* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/8541	Endangered

Critical habitats

There is 1 critical habitat wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
Delta Smelt *Hypomesus transpacificus* https://ecos.fws.gov/ecp/species/321#crithab	Final

NMFS Species List

Quad Name **Antioch North**
Quad Number **38121-A7**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) - **X**
SRWR Chinook Salmon ESU (E) - **X**
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) - **X**
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) - **X**
Eulachon (T) -
sDPS Green Sturgeon (T) - **X**

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat - **X**
SRWR Chinook Salmon Critical Habitat - **X**
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat -
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat - **X**
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat - **X**

ESA Marine Invertebrates

Range Black Abalone (E) -

Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH -	
Chinook Salmon EFH -	**X**
Groundfish EFH -	**X**
Coastal Pelagics EFH -	**X**
Highly Migratory Species EFH -	

Quad Name **Antioch South**
Quad Number **37121-H7**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) -
SRWR Chinook Salmon ESU (E) -
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) - **X**
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) - **X**
Eulachon (T) -
sDPS Green Sturgeon (T) -

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat -
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat -
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat -
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat -

ESA Marine Invertebrates

Range Black Abalone (E) -
Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH -
Chinook Salmon EFH - **X**
Groundfish EFH -
Coastal Pelagics EFH -
Highly Migratory Species EFH -

Quad Name **Jersey Island**
Quad Number **38121-A6**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) - **X**
SRWR Chinook Salmon ESU (E) - **X**
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) -
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) - **X**
Eulachon (T) -
sDPS Green Sturgeon (T) - **X**

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat - **X**
SRWR Chinook Salmon Critical Habitat - **X**
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat -
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat - **X**
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat - **X**

ESA Marine Invertebrates

Range Black Abalone (E) -
Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH -
Chinook Salmon EFH - **X**
Groundfish EFH - **X**
Coastal Pelagics EFH -
Highly Migratory Species EFH -

Quad Name **Brentwood**
Quad Number **37121-H6**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) -
SRWR Chinook Salmon ESU (E) -
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) -
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) - **X**
Eulachon (T) -
sDPS Green Sturgeon (T) -

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat -
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat -
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat -
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat -

ESA Marine Invertebrates

Range Black Abalone (E) -
Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH -
Chinook Salmon EFH - **X**
Groundfish EFH - **X**
Coastal Pelagics EFH -
Highly Migratory Species EFH -

APPENDIX B2

Stantec

Memo

To:	Zoe Merideth City of Antioch	From:	Elena Nuno Walnut Creek
File:	185705365	Date:	June 28, 2021

Reference: Biological Assessment Prepared for Department of Army – Corps of Engineers Section 7 Endangered Species Act Consultation AMPORTS Antioch Berth Rehabilitation Project, Contra Costa County, California

The Initial Study/Mitigated Negative Declaration (IS/MND) prepared for the AMPORTS Antioch Vehicle Processing Facility Project relied on the Biological Assessment prepared in December 2018 for a larger project. The 2018 Project contemplated using a larger land area for vehicle processing. The 2018 project contemplated using the land east of the project site for additional vehicle storage/processing. The wharf improvements contemplated under the 2018 project are consistent with the proposed improvements in the 2021 AMPORTS Antioch Vehicle Processing Facility Project. As such, the IS/MND for the 2021 AMPORTS Project has relied on previous findings related to acoustic impacts to aquatic species from the use of a vibratory hammer and impact hammer during in-water construction work.

The in-water work for the 2021 Project has been refined, therefore the summary of new and removed in-water piles and over-water structures should be based off the current 2021 Project Description. The in-water impacts evaluated in the 2018 report are within those evaluated in the 2021 Project.

Readers of this technical report should focus their attention to Section 5.0 of the 2018 Biological Assessment. Section 5.0 evaluates the way the construction of the project may affect species and critical habitat.

Stantec Consulting Services Inc.

Elena Nuno
Principal Planner/Air Quality Scientist
Phone: 559.355.0580
elena.nuno@stantec.com

Attachment: Biological Assessment Prepared for Department of Army – Corps of Engineers Section 7 Endangered Species Act Consultation AMPORTS Antioch Berth Rehabilitation Project, Contra Costa County, California.

Biological Assessment

Prepared for Department of Army - Corps of Engineers

Section 7 Endangered Species Act Consultation

AMPORTS Antioch Berth Rehabilitation Project, Contra Costa County, California

Prepared for:
AMPORTS
1997 Elm Street
Benicia, CA 94510Contact:
Contant: Jimmy Triplett

Prepared by:
WRA, Inc.
2169-G East Francisco Blvd
San Rafael, California 94901
Contact: Katie Fedeli
fedeli@wra-ca.com

WRA Project: 27327

Date: December 2018

ENVIRONMENTAL CONSULTANTS

TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

LIST OF ACCRONYMS AND ABBRIEVATIONS

Applicant	COWI North America, Inc.
BD	breasting dolphin
BMP	best management practice
°C	degrees Celsius
Caltrans	California Department of Transportation
CDFW	California Department of Fish and Wildlife
CNDDB	California Natural Diversity Database
CFR	Code of Federal Regulations
cm	centimeters
Corps	U.S. Army Corps of Engineers
dB	decibel
DPS	Distinct Population Segment
EFH	Essential Fish Habitat
ESA	Endangered Species Act
ESU	Evolutionary Significant Unit
ft	feet or foot
GP	Georgia-Pacific
HDPE	High-density polyethylene
MD	mooring dolphin
MLLW	Mean Low Low Water
m	meter or meters
mm	millimeter
NAVD88	North American Vertical Datum of 1988
µPa	micro Pascal
m	meters
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NTUs	nephelometric turbidity units
ppt	parts per thousand
RMS	root mean square
River	San Joaquin River
RoRo	roll on, roll off
SEL	sound exposure level
USFWS	US Fish and Wildlife Service
WEAP	worker environmental awareness program
WRA	WRA Inc.

DEFINITION OF TERMS SPECIFIC TO PROPOSED PROJECT

Action – Required activities undertaken for mooring and berthing upgrades and wharf repair, including avoidance and minimization proposed for unavoidable impacts.

Action Area – The regions where the Action will take place and additional areas that may be affected by the Action. The Action Area includes the AMPORTS wharf, adjacent upland staging, access, and work areas. The Action Area also includes areas outside the Project Area (see Section 3.0) to demonstrate potential acoustic effects of the Action.

Project Area – The areas where berth rehabilitation and improvements will take place. The Project Area includes the existing AMPORTS wharf structure, and the areas to be occupied by the replacement wharf structures, mooring dolphins, breasting dolphins, along with adjacent staging, access, and work areas.

1.0 INTRODUCTION

The purpose of this Biological Assessment is to describe the proposed construction activities associated with required upgrades at the AMPORTS Antioch Berth Rehabilitation Project (Action) located in Antioch, Contra Costa County, California (Action Area, Figure 1 and Figure 2) in sufficient detail to determine to what extent the proposed Action may affect any of the threatened, endangered, or candidate species (Appendix A) that are likely to be present in the Action Area, and any designated or proposed critical habitat in the Action Area.

On behalf of the Applicant (AMPORTS), WRA, Inc. (WRA) submits this Biological Assessment to the Sacramento U.S. Army Corps of Engineers (Corps) Regulatory Division to accompany the Request for a Nationwide Permit for the Action Reference. Activities entail repairs and upgrades of the existing wharf and berth to convert the wharf to a "Roll on Roll off" (RoRo) facility for loading and unloading cargo. Based upon the analysis included herein, avoidance and minimization measures are recommended to avoid and limit take or other impacts to the listed species and critical habitat that may be affected by the proposed Action. Of the many species with potential to occur in the general region, six threatened or endangered fish species have the potential to occur in the Action Area: Delta smelt (*Hypomesus transpacificus*; Federal Threatened), Central Valley steelhead (*Oncorhynchus mykiss*; Federal Threatened), Southern Distinct Population Segment (DPS) green sturgeon (*Acipenser medirostris*; Federal Threatened), Central Valley spring-run Chinook salmon (*O. tshawytscha*; Federally Threatened), Sacramento River winter-run Chinook salmon (*O. tshawytscha*; Federally Endangered), and longfin smelt (*Spirinchus thaleichthys*; Federal Candidate). The Action Area also includes critical habitat for green sturgeon, Central Valley steelhead, and Delta smelt. This Biological Assessment is prepared in accordance with legal requirements set forth under Section 7 of the Endangered Species Act (ESA) (16 U.S.C. 1536 (c)).

1.1 Federally Listed Species Considered (Including Candidate Species)

Species considered in this document are listed in Table 1. Any federal listed or proposed species recorded in the California Natural Diversity Database (CNDDB) within 5-miles of the Action Area are shown in Figures 3a and 3b. Primarily due to a lack of suitable habitat within the Action Area, or the Action Area being located outside of the current range of the species, it was determined that the proposed Action would have no effect on: salt-marsh harvest mouse, San Joaquin kit fox, American peregrine falcon, bald eagle, California brown pelican, California least tern, Ridgway's clapper rail, Western snowy plover, Alameda whipsnake, California red-legged frog, California tiger salamander, giant garter snake, Chinook salmon – Central California Coast, Coho salmon, Callippe silverspot butterfly, conservancy fairy shrimp, Delta green ground beetle, longhorn fairy shrimp, Lange's Metalmark Butterfly, San Bruno elfin butterfly, valley elderberry longhorn beetle, vernal pool fairy shrimp, vernal pool tadpole shrimp, Antioch Dunes evening primrose Colusa grass, Contra Costa goldfields Contra Costa wallflower, Keck's checker-mallow, large-flowered fiddleneck, or Soft bird's beak.

The Action is taking place in a fresh/brackish, deepwater, subtidal area in the San Joaquin River where no vegetation is present. The absence of vegetation such as salt marsh or habitat features such as tidal flats completely eliminates required habitat for species like salt marsh harvest mouse or California Ridgway's rail, and as such the aforementioned species have no potential to be present, or to be affected by the Action. Furthermore, areas adjacent to the Action do not support suitable habitats, or are outside of the area of influence for the Action. Further discussion of the lack of habitat, or absence of the species are discussed in Appendix A but these species are not considered further for this assessment.

Lange's metalmark butterfly (*Apodemia mormo langei*) is known to inhabit the Antioch Dunes Wildlife Refuge adjacent to the Action Area. However, the known habitats occupied by this species are more than 1,000 feet away from where work will occur. No host plants, suitable nectar plants or suitable natural upland habitats are present within the Action Area to support the species. No reasonably foreseen interrelated or interdependent activities associated with the wharf rehabilitation would result in potential indirect effects to the butterfly. Therefore while the species is known to occur in the vicinity, the species is unlikely to occur within the Action Area, or to be affected by operations within the Action Area.

Table 1. Federal listed and candidate species, critical habitat, and EFH considered in this document

Common name (Scientific name) Federal Status	**Effect Determination**
Wildlife	
Alameda whipsnake (*Masticophis lateralis euryxanthus*) T	No Effect
American peregrine falcon (*Falco peregrinus anatum*) D	No Effect
Bald eagle (*Haliaeetus leucocephalus*) D	No Effect
California brown pelican (*Pelecanus occidentalis californicus*) D	No Effect
California least tern (*Sternula antillarum* (=*Sterna, =albifrons*) *browni*) E	No Effect
California red-legged frog (*Rana aurora draytonii*) T	No Effect
California tiger salamander (*Ambystoma californiense*) T	No Effect
Callippe Silverspot Butterfly (*Speyeria callippe callippe*) E	No Effect
Chinook salmon - Central California Coast (*Oncorhynchus tshawytscha*)	No Effect
Chinook salmon - Central Valley Spring-run (*Oncorhynchus tshawytscha*) E	**Likely to Adversely Affect**
Chinook Salmon - Sacramento River Winter-run (*Oncorhynchus tshawytscha*) E	**Likely to Adversely Affect**
Coho salmon - Central California Coast (*Oncorhynchus kisutch*) E	No Effect
conservancy fairy shrimp (*Branchinecta conservation*) E	No Effect
Delta green ground beetle (*Elaphrus viridis*) T	No Effect
Delta smelt (*Hypomesus transpacificus*) T	**Likely to Adversely Affect**
giant garter snake (*Thamnophis gigas*) T	No Effect
green sturgeon – Southern DPS (*Acipenser medirostis*) T	**Likely to Adversely Affect**
Lange's Metalmark Butterfly (*Apodemia mormo langei*) E	No Effect
longfin smelt (*Spirinchus thaleichthys*) C	**Likely to Adversely Affect**
Ridgway's clapper Rail (*Rallus longirostris obsoletus*) E	No Effect
salt-marsh harvest mouse (*Reithrodontomys raviventris*) E	No Effect
San Bruno elfin butterfly (*Incisalia (=Callophrys) mossii bayensis*) E	No Effect

Table 1. Federal listed and candidate species, critical habitat, and EFH considered in this document

Common name (Scientific name) Federal Status	**Effect Determination**
San Joaquin kit fox (*Vulpes macrotis mutica*) E	No Effect
steelhead - California Central Valley (*Oncorhynchus mykiss*) T	**Likely to Adversely Affect**
steelhead - Central California Coastal (*Oncorhynchus mykiss*) T	No Effect
tidewater goby (*Eucyclogobius newberryi*) E	No Effect
valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) T	No Effect
vernal pool fairy shrimp (*Branchinecta lynchi*) T	No Effect
vernal pool tadpole shrimp (*Lepidurus packardi*) E	No Effect
western snowy plover (*Charadrius alexandrinus nivosus*) T	No Effect
Plants	**Effect Determination**
Antioch Dunes evening primrose (*Oenothera deltoides* ssp. *howellii*) E	No Effect
Contra Costa goldfields (*Lasthenia conjugens*) E	No Effect
Colusa grass (*Neostapfia colusana*) T	No Effect
Contra Costa wallflower (*Erysimum capitatum* ssp. *angustatum*) E	No Effect
Keck's checker-mallow (*Sidalcea keckii*)	No Effect
Large-flowered fiddleneck (*Amsinckia grandiflora*) E	No Effect
Soft bird's-beak (*Cordylanthus mollis* ssp. *mollis*) E	No Effect
Critical Habitat and Essential Fish Habitat	**Effect Determination**
Chinook Salmon - Spring-run	No Effect
Chinook Salmon - Winter-run	No Effect
Delta smelt	**Not Likely to Destroy or Adversely Modify**
green sturgeon – Southern DPS	**Not Likely to Destroy or Adversely Modify**
steelhead - Central California Coast	No Effect
Steelhead - Central Valley	**Not Likely to Destroy or Adversely Modify**
Chinook salmon EFH	**Not Likely to Destroy or Adversely Modify**
Coastal pelagic EFH	**Not Likely to Destroy or Adversely Modify**
Groundfish EFH	**Not Likely to Destroy or Adversely Modify**
Key to Listing Status: E – Endangered T – Threatened D – Delisted	

The analysis included herein concludes that the Action may adversely affect Delta smelt, Central Valley steelhead, Southern DPS green sturgeon, Central Valley spring-run Chinook salmon, Sacramento River winter-run Chinook salmon, and longfin smelt. The avoidance and minimization measures proposed by the Applicant will offset effects of the Action and avoid unnecessary take of these species. Also included with this Biological Assessment is an Assessment of Effects to Essential Fish Habitat (EFH), included as Appendix E.

1.2 Critical Habitat

Critical habitat is a term defined and used by the ESA as a specific geographic area that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection. The ESA requires federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) to conserve listed species on their lands and to ensure that any activities or projects they fund, authorize, or carry out will not jeopardize the survival of a threatened or endangered species.

Critical habitat is currently designated for Southern DPS green sturgeon, Delta smelt and Central Valley steelhead within the Action Area (Figure 4). Designated critical habitat for Southern DPS green sturgeon, Central Valley steelhead, and Delta smelt is likely to be adversely modified by the Action due to a small increase in shaded area. However, effects to the habitat will be fully mitigated by the purchase of off-site credits at an approved mitigation bank, or through the restoration of an appropriate amount of habitat at an offsite location.

1.3 Consultation to Date

No consultation has been initiated to date.

1.4 Summary of Proposed Action

The proposed Action consists of structural upgrades at the wharf, including adding, replacing, and removing pilings as well as decking in order to comply with engineering requirements and renewed use of the wharf. Potential impacts to federal listed species during construction will be minimized by the Action's design and implementation.

1.4.1 Action Agency

The Action Agency for the proposed Action is the Corps.

1.4.2 Applicant, Contacts, and Authorized Agent

AMPORTS is the Applicant and will be responsible for minimization and avoidance measures related to the Action. The address and telephone number for the Applicant is:

> AMPORTS
> 1997 Elm Street
> Benicia, CA 94510Contact: Jimmy Triplett, Senior Vice PresidentPhone: (707) 745-2394
> Email: JTriplett@amports.com

This Biological Assessment was prepared by WRA and serves as the Authorized Agent. Contact information for the Authorized Agent is:

WRA, Inc.
2169-G East Francisco Blvd.
San Rafael, California 94901
Contact: Katie Fedeli
(415) 524-7674

Additional information provided for the preparation of this document includes engineering design by the Applicant. The address and telephone number is:

Haze Rodgers COWI North America, Inc.
1300 Clay St.
7th Floor
Oakland, CA 94612

1.4.3 Purpose of Action

The purpose of the proposed Action is to convert the former Gaylord Paper facility pulp berth to a roll-on roll-off (RoRo) berth in order to accommodate vessels that will deliver and transfer cargo from the property to other locations. The proposed Action will include the demolition of treated timber structures such as wooden piles and planking, concrete repair, installation of new steel, and concrete piles, concrete deck installation, new breasting dolphin (BD) installation, and new mechanical and lighting components. The existing footprint of the wharf will remain primarily the same as existing conditions, with the exception of a new ramp to accommodate RoRo loading and unloading.

2.0 EXISTING CONDITIONS

2.1 Action Area Location and Site Description

The wharf and areas where new structures and work will occur (Project Area) is located offshore along the San Joaquin River (River) at 2301 Wilbur Avenue, in an unincorporated area of Contra Costa County, approximately 1.5 miles west of the Senator John A. Nejedly Bridge, and east of Suisun Bay (Figure 1). The existing wharf is situated approximately 60 feet (ft) off of the south shoreline and south of West Island. Industrial and commercial facilities are located immediately to the west, east and south of the Action Area. The Sardis Unit of the Antioch Dunes National Wildlife Refuge is located approximately 1,400 ft (0.26 mile) southwest of the Action Area.

2.2 Plant Communities

The majority of the Project Area is located in open water or consists of developed armored shoreline and paved parking lots. The River deposits in the area surrounding the Project Area generally consist of stiff to hard clays with medium dense to very dense sand with varying amounts of silt and clay. No rooted submerged aquatic vegetation is present within the Project Area.

The shoreline bordering the aquatic portion of the Project Area is a steep river bank armored with heavy rip rap and is mostly unvegetated. Small areas of ruderal vegetation occur along the top of the bank where a gap in the riprap allows a chain-link security fence to surround the upland portions of the AMPORTS facility. The adjacent uplands are fully developed as parking lots which have been either paved, or covered in gravel to allow easy movement of vehicles.

2.3 Surveys for Federal Listed Species and Habitat

WRA searched the California Department of Fish and Wildlife (CDFW) CNDDB for documented occurrences of federal listed species near the Action Area (CDFW 2018). Results are presented in Figure 3a and 3b.

2.4 Hydrography

The bathymetry in the Project Area tapers dramatically from the shoreline to the center of the River. Water depth at the wharf is approximately 4.7 meters (m) (15.5 ft) below Mean Low Low Water (MLLW) (COWI 2017). Depths along the south side (shore side) of the wharf are within this same range and vary from 2.9 m to 4.7 m (9.8 to 15.5 ft) below MLLW. Depths on the north side of the wharf (river side) quickly drop off to more than 9 m (29.7 ft) MLLW. Current speed based on the National Oceanic and Atmospheric Administration (NOAA) 2014 tidal predictions for the general Action Area are a maximum ebb current of approximately 1.2 knots, and a maximum flow current of 0.7 knots (BCG 2014).

2.5 Current Operations

The wharf is currently in an inoperable state and has not serviced vessels for several years. The unsafe structural condition of the wharf has led to general disuse until the financial means have come available to undergo upgrades and rehabilitation.

Currently the section of River surrounding the wharf is maintained as a commercial shipping channel and is dredged to accommodate large ocean-going cargo ships moving to and from the Port of Stockton.

Upland areas directly adjacent to the project site are currently used for the storage and movement of automobiles. These operational conditions are anticipated to remain unchanged following completion of the project.

3.0 DESCRIPTION OF THE ACTION TO BE CONSIDERED

3.1 Description of General Activities

General activities involve structural upgrades of the mooring and berthing system that are required to assure structural integrity, seismic stability and to accommodate ocean-going vessels which will be calling on the wharf.

3.2 Delineation of Action Area

An Action Area is defined in 50 Code of Federal Regulations (CFR) § 402.02 as, "all areas to be affected directly or indirectly by the Federal Action and not merely the immediate area involved in the action." The delineation of the Action Area accounts for effects associated with ground disturbance, changes to surface water and ground water quantity and quality, air quality effects, lighting effects, and noise disturbance.

For the six aquatic species, managed by NMFS and USFWS, the Action Area includes the Project Area (location of the wharf and areas occupied by equipment and wharf structures) as well as approximately 3,400 m[1] radius around the Project Area (Figure 5). It is anticipated that West Island would act as a barrier to underwater sound generated as a result of the Project, and would therefore prevent the southeast portion of Sherman Island from being affected. Table 2 provides the area for the aquatic Action Area, and more specific areas of activity within the aquatic environment.

Table 2. Action Area Details

Area	Radius (m)*	Description
Action Area	3,400	The anticipated maximum distance for 150 dB using attenuation; discussed in greater detail and shown on Fig 5 of the Biological Assessment.
Acoustic Impact Area	470	The anticipated maximum distance for cumulative SEL of 183 dB using attenuation; discussed in greater detail and shown on Fig 5.
*= Parts of a buffer that extends onto the shore (i.e. out of the channel) was not included in the area calculation as the impact to federal species is aquatic based		

Operational conditions following completion of the wharf rehabilitation are anticipated to remain unchanged from current conditions. Operations following the wharf upgrade will generally consist of the storage and movement of automobiles on existing paved and graveled areas. These operations are not reasonably foreseen to result in any direct or indirect effects to listed species. Therefore, areas upland of the project site are not considered to be part of the Action Area.

3.3 Action Description

3.3.1 Construction Schedule

Construction would take approximately five months to complete and is anticipated to occur as soon as documents and permits are obtained[2]. In-water work (including pile driving) would occur between July 1 and November 30 for concrete piles and August 1 and November 30 for steel piles to minimize impacts to sensitive fish species. The in-water work is anticipated to take approximately 8-14 weeks to complete. Work on structures raised above the water may occur outside of this window, supported by construction barges as-needed.

All work would occur between 7:00am and 6:00pm on weekdays and between 9:00am and 5:00pm on weekends and holidays.

---

[1] The NOAA Fisheries spreadsheet introduces the concept of "effective quiet." This concept assumes that energy from pile strikes that is less than 150 dB-SEL does not accumulate to cause injury. For any given condition, at some distance, sound attenuates to the level of effective quiet (i.e., 150 dB-SEL). The distance to a 150 dB-SEL for the largest pile being driven with the use of sound attenuation devices was assessed for a similar project in Illingworth & Rodkin, Inc. (2014) *Georgia-Pacific Antioch Terminal Breasting Dolphin Replacement Project Underwater Noise Assessment*. This distance is considered the full extent for potential impact of the proposed project.

[2] Specific construction dates are subject to change based on the timing of approvals from regulatory agencies.

3.3.2 Construction Equipment

The following large-scale construction equipment would be used to carry out the proposed Project.

- Derrick crane barges
- Material barges
- Tugboats
- Vibratory hammer
- Impact hammer

Additional details regarding the vibratory and impact hammers are included below.

<u>Vibratory Hammer</u>

A vibratory hammer would be used for both removal and installation of piles. For pile extraction, a vibratory hammer would be attached to the pile and then the pile would be pulled vertically with a crane. The vibratory hammer serves to break the seal or suction between the pile and the sediment holding the pile in place. Timber piles contained within the existing breasting dolphins will be broken off at the mudline to preserve the lateral soil capacities for the new steel piles to be placed nearby. For installation, the vibratory hammer would be used to sink any steel piles to the extent possible before installation is completed with the impact hammer. The vibratory hammer will also be used to install high density polyethylene (HDPE) fender piles.

<u>Impact Hammer</u>

A diesel impact hammer would be used to drive concrete piles required for construction, and to complete the installation of steel piles after the vibratory hammer has driven piles to refusal. The impact hammer would employ a hammer cushion and “soft-start” (slowly increasing the intensity of strikes). In addition, a bubble curtain system would be deployed when installing steel piles to reduce underwater noise levels.

3.3.3 Construction Activities

Construction activities, including areas left in place, areas to be demolished and not replaced, areas to be demolished and replaced, and new construction and repairs, are outlined below. Table 3 outlines the summary of volume of material to be demolished replaced below the waterline. Table 4 outlines the summary of surface area of new and removed over-water structures.

All existing timber is treated with creosote and will be disposed of at an upland facility. New breasting dolphin caps will be precast on land, then placed on top of the steel piles in-water.

<u>Existing Structures to Remain in Place</u>

There are four existing mooring dolphins (MD-1 through MD-4). These four mooring dolphins will remain in place.

The majority of the existing wharf will remain in place, with some small portions demolished and some structural and safety/operational repairs made as described below. An existing, isolated pier is located to the east of the main wharf facilities which will remain in place to allow operations and maintenance access to and egress from the easternmost mooring dolphins. There are two existing pipeways/timber walkways and an existing concrete ramp that connect the existing wharf facilities to the shoreline, which will remain in place to allow wharf access from the landside. These pipes were previously used for the pulp conveyance, and will be left abandoned in place.

Structural and Operational Safety Repairs and Improvements

Structural and operational safety repairs and improvements include the following:

- Concrete spall repairs: Loose material will be removed and replaced with new concrete.
- Existing steel support beam repairs: Surface materials (oil, grease, dirt, etc.) will be removed and coated with new epoxy based paint.
- Pile sleeve repairs: Up to five existing corroded steel piles will be repaired using fiberglass pile sleeves. Corroded portions of piles will be removed, fiberglass pile sleeves will be installed, and a fully contained grout mixture will be injected into the pile sleeves.
- 55 steel H-piles will have their original epoxy coating repaired above mean lower low water.
- Damaged wood on existing retained walkways will be replaced in-kind.
- Decking and railing: Minor repairs will be conducted on existing decking and railing of walkways, such as adding a raised safety rail to existing decking.
- Fender pile repairs: New HDPE fender piles and blocking will be installed to replace damaged, missing, and removed existing creosote treated fender piles and blocking as needed.

Table 3. Summary of New and Removed In-Water Piles

Structure Type	# Piles Removed	# New Piles	Removed In-Water Volume (yd^3)	Added In-Water Volume (yd^3)	Removed In-Water Surface Area (ft^2)	Added In-Water Surface Area (ft^2)
Breasting Dolphins (BD-1, BD-2, BD-3, BD-4, BD-5) [Remove 16 -12" creosote piles, ea, BD 1-4, Replace with 1-72" pile ea, BD 1-5]	64	5	71	190	50	141
Decking and Framing (including walkway between MD-1 & MD-2) [Remove 12" and 15" creosote piles]	56	--	79	--	65	--
East Pier Pile Clusters [Remove 12" creosote piles]	8	--	7	--	6	--
Stern Ramp Fender System [13" HDPE piles]	--	29	--	38	--	26
Stern Ramp and Walkway [24" concrete piles]	--	47	--	127	--	155
Mooring Dolphin (MD-5) [72" steel pile]	--	1	--	22	--	28
Totals	**128**	**82**	**157**	**377**	**121**	**350**
Net Change	**- 46**		**+ 220**		**+ 229**	

Table 4. Summary of New and Removed Over-Water Structures

Structure Type	Solid / Grated Cover	Removed Over-Water Solid Surface Area (ft^2)	Added Over-Water Surface Area (ft^2)
Breasting Dolphins [BD-1, BD-2, BD-3, BD-4, BD-5]	Solid Cover	601	794
Existing Wharf Decking and Framing	Solid Cover	590	--
Stern Ramp and Fender System	Solid Cover	--	10,213
Mooring Dolphin [MD-5]	Solid Cover	--	186
Stairs, walkways	Removed Solid Cover New Grated Cover	1,441	667
	Total	**2,632**	**11,860**
	Summary	**9,228 ft^2 Total Net New Over-Water Cover (Including 667 ft^2 of Grated Cover)**	

Repairs to the existing piles would be performed concurrently with demolition and/or construction activities within the in-water work window, and would be performed from a barge moored alongside the wharf, small work skiffs, and work floats.

Demolition of Structures without Replacement

Demolition of structures not to be replaced are outlined below.

Decking and Framing

Selected reaches of the existing concrete and timber decking and framing along the northern and western margins of the existing wharf will be demolished and not replaced. This will result in a reduction of approximately 0.01 acre (590 sq. ft.) of solid over-water cover and removal of 56 creosote piles. Less than 0.01 acre (65 sq. ft.) of pile related fill will be removed. The decking will be removed by a combination of work on the wharf and by barge. Materials will be transported by barge to an approved disposal location.

East Pier Pile Clusters

Two clusters of existing creosote piles (eight total) will be demolished immediately north of the pier and will not be replaced. This will result in the removal of less than 0.01 acre (6 sq. ft.) of pile related fill. A barge would be used to remove the timber creosote pilings by using one or a combination of the following methods:

- **Vertical Pulling**: Involves gripping the pile with a chain, cable or collar and pulling up vertically with a cable or hydraulic crane. Vertical pulling is the preferred method of removal and will be attempted before other methods are employed.
- **Vibratory Extraction:** Vibratory extraction involves attaching a vibratory hammer to the pile and pulling vertically with a crane or excavator, as described above.

- **Horizontal Snapping and Breaking:** This method does not completely remove the pile, and would be employed only if complete removal was infeasible or if the piles break during the removal process due to deterioration. It typically involves pushing or pulling the pile laterally to break the pile off near the mudline. Snapping typically breaks the pile at the weakest point near the mudline which is typically one to three feet below the mudline, but this technique can leave part of the pile above mudline particularly if the pile is highly degraded, which increases the likelihood of a navigation or safety hazard. Snapping may result in more sunken or floating broken debris than pulling or cutting particularly for degraded piles. In the event a pile breaks during removal, a clamshell and/or chain would be used to grip the remaining broken piece and complete the removal process.

The pilings and/or piling remnants would be loaded onto a barge and removed from the Project area to an approved disposal facility. As described above, equipment would include a derrick barge, a tug, a material barge to hold the removed piles and debris and one or more smaller craft to move workers, supplies, anchors and other equipment.

Demolition and Replacement of Existing Structures

Existing Breasting Dolphins

All of the four existing breasting dolphins (BD-1 through BD-4) have failed, either structurally, geotechnically, or both. The existing breasting dolphins will be demolished and replaced with new dolphins equipped with energy absorbing fenders. This includes removing a total of 64 timber creosote piles, 16 12” piles per breasting dolphin, to the mudline, using the pile removal method described above. The new breasting dolphins will provide berthing capabilities to vessels along the face of the wharf. These four existing breasting dolphins would each be replaced with a single 72” steel pile outfitted with an energy-absorbing fender. Approximately 0.01 acre (601 sq. ft.) of existing solid over water cover will be demolished and removed and less than 0.01 acre (600 sq. ft.) of new solid over-water cover will be installed during construction. This will result in less than 0.01 acre (50 sq. ft.) of pile related fill to be removed and less than 0.01 acre (113 sq. ft.) of pile related fill to be replaced.

Western Walkway

The portion of the western walkway from the existing wharf to Mooring Dolphin 2 (MD-2) will be demolished and replaced with a new grated decking walkway. Wherever feasible, the project has been designed to incorporate grated decking into areas being replaced. Approximately 0.03 acre (1,441 sq. ft.) of solid over-water cover will be demolished and removed as a result of construction, and replaced with approximately 0.01 acre (approximately 667 sq. ft.) of grated decking material associated with the new stern ramp deck described below.

Existing Creosote Treated Fender Piles

Approximately 26 to 30 existing creosote treated, 12-14” diameter, timber fender piles at the existing wharf will be removed and replaced by 13” diameter HDPE fender piles with no net change in volume or area. Some associated creosote treated blocking between the piles at the approximate deck elevation will also be replaced with HDPE lumber with no net change in cover area.

New Construction and Repairs

New Breasting and Mooring Dolphins

One completely new breasting dolphin (BD-5), consisting of one new 72” pile and an energy-absorbing fender with new mooring hardware, will be constructed and one completely new mooring dolphin (MD-5), consisting of one new 72” pile with new mooring hardware, will be constructed in order to accommodate larger vessels. This will result in less than 0.01 acre (approximately 186 sq. ft.) of new solid over-water cover. This will result in less than 0.01 acre (28 sq. ft.) of new pile related fill. Less than 0.01 acre (380 sq. ft) of new solid deck area will also be installed.

Stern Ramp Deck and Fender System

A new stern ramp deck will be installed in the area between the existing Mooring Dolphin 1 (MD-1) and Mooring Dolphin 2 (MD-2). The existing walkway between MD-1 and MD-2, including 8 timber creosote piles will be demolished to accommodate the new stern ramp. The new stern ramp will consist of an approximately 0.23 acre (10,213 sq. ft.) of concrete slab over water supported by 47 new 24” octagonal concrete piles. The stern ramp will be bordered around the northern margin and portions of the western and eastern faces by a fender pile system consisting of 29 new 13” diameter HDPE piles. The concrete deck slab for the stern ramp will be cast-in-place after the concrete piles are installed. The stern ramp will be connected to MD-2 by a new grated tread steel staircase.

New Grated Cover Walkways and Stairs

Grated walkways will be designed to provide pedestrian access along the wharf facility. Less than 0.01 acre (354 sq. ft.) of new grated over-water cover will be constructed. Details are included below on these new structures:

- One grated deck steel walkway will be constructed between the existing wharf and breasting dolphin (BD-5) and will include less than 0.01 acre (12 sq. ft.) of new grated over-water cover.
- One aluminum grated walkway will be constructed from Mooring Dolphin 4 (MD-4) to Mooring Dolphin 5 (MD-5). A smaller, separate grated deck steel walkway will also provide access between MD-5 and the existing east pier, for a combined less than 0.01 acre (approximately 342 sq. ft.) of new grated over-water cover.

All existing timber is treated with creosote and will be disposed of at an upland facility. New breasting dolphin caps will be precast concrete on land, then placed on top of the steel piles in-water. No creosote treated timber will be used in the construction of new wharf features.

3.4 Pile Driving Activities

The contractor and Applicant’s engineer anticipate using vibratory and impact hammers to drive the piles. Using data from previous projects in the vicinity, it is estimated that each steel shell pile will require approximately 30 minutes of vibratory driving, and 600 to 1,700 blows with an impact hammer to drive the piles to their final elevation, depending on the diameter of the piles (Illingworth & Rodkin 2017). It is anticipated that a vibratory hammer and a diesel impact hammer would be required to drive the 72-inch piles. Concrete piles used for the stern ramp and fender will be driven using a diesel impact hammer as driving concrete piles requires the use of an impact hammer.

Each steel pile is estimated to be driven to the majority of its required depth during the estimated 30 minute driving period. Once the pile reaches refusal, impact hammer driving would then be used until the pile reaches its required depth. The Action is anticipated to install one (1) steel pile per day (72-inch), and up to three (3) concrete piles per day. It is estimated that in-water construction will take 56 to 98 days. The high variability in work period is primarily related to the number of concrete piles that will be able to be driven per day by the contractor and varies based on weather conditions and conditions within the River. All pile driving activities are anticipated to occur between July 1 and November 30. A description of the type of pile to be driven and their location is provided in Table 3 and Appendix C.

3.5 Avoidance and Minimization Measures

The Applicant proposes a number of avoidance and minimization measures to reduce the potential for take of listed fish species. Prior to construction, a worker environmental awareness program (WEAP) will be conducted to discuss potential listed species on the site. At minimum, the WEAP will consist of a brief presentation by persons knowledgeable in listed species biology and legislative protection to those personnel performing in-water work within the Action Area. Contractors, their employees, and agency personnel will undergo WEAP training prior to involvement with construction activities in the Action Area. The WEAP will include the following:

- A description of the species and their habitat needs,
- Reports of occurrences in the Action Area,
- An explanation of the status of each listed species and their protection under the ESA, and
- A list of measures being taken to reduce potential effects to the species during construction and implementation.

Fact sheets conveying this information will be prepared for distribution to the above-mentioned people and anyone else involved with in-water work activities in the Action Area. Records of sensitive species training will be retained by the approved biologist.

For all work being performed:

1) Standard construction best management practices (BMPs) will be implemented during demolition and construction. BMPs used on site will include:
    a) A Spill Prevention and Control Plan will be developed and will contain measures to prevent and control potential spills of hazardous materials associated with mechanical equipment (oil, gas, hydraulics, etc.), as well as measures to minimize contact with the stream bed, such as work pads. The Spill Prevention and Control Plan and materials necessary to implement it will be accessible on site;
    b) A debris containment boom will be installed around the work area. Any debris discharged into water will be recovered immediately.

Measures proposed for use during in-water construction for the avoidance and minimization of potential hydroacoustic effects to fish include:

1) All in-water work shall be performed within the environmental work windows: between July 1 - November 30 for driving concrete piles, and from August 1 - November 30 for steel piles.
2) A vibratory hammer will be used to start the installation of each steel pile, and will continue as long as geotechnical conditions permit.

3) When installation with a vibratory hammer is no longer possible (i.e. the pile has reached refusal), an impact hammer will be used to complete installation and drive the pile to its final elevation.
4) Underwater sound monitoring will be performed during impact hammer driving of steel piles and for the first five (5) concrete piles. Underwater sound reduction measures will include one or more of the following:
    a) use of impact hammers only during daylight hours;
    b) use of a soft start. This method entails gradually increasing energy and frequency of impacts to permit wildlife to vacate the surrounding area,
    c) use of a bubble curtain during pile driving operations that use an impact hammer for driving steel piles, and
    d) impact hammers may also employ a metallic or other such cushion block. Wood cushion blocks will not be deployed to avoid fire danger.
    e) If an exceedance of the 187 dB SEL at 840 feet occurs, incidental take may be exceeded. At that time additional measures shall be reviewed for implementation by NMFS and the Applicant.
5) Concrete piles may be installed without the use of a bubble curtain or attenuation devices as they are not expected to surpass 206 decibel (dB) at any distance.
6) All water quality protection requirements identified in the 401 certification for the Project will be followed.

4.0 STATUS OF THE SPECIES AND CRITICAL HABITAT IN THE AREA

The life history information presented below is largely taken from the *Supplemental Biological Opinion for the Completion of Pile Driving and Other Remaining Activities* (NMFS 2009) and further informed by the Services Reinitiation of Formal Endangered Species Consultation and Amendment to the Biological Opinion (File # 1-1-96-F-40) for the New Benicia Martinez Bridge Project (January 9, 2001), the 2008 Formal ESA Consultation on the Proposed Coordinated Operations of the Central Valley Project and State Water Project, and the 2001 NMFS Biological Opinion for the San Francisco-Oakland Bay Bridge East Span Seismic Project (NMFS 2001).

4.1 General Life History for Green Sturgeon

The Southern DPS of green sturgeon was listed as threatened by the NMFS on April 7, 2006 (71 FR 17757). Critical habitat for the species was designated on October 9, 2009 (74 FR 52300). A 5-year status review of green sturgeon was completed on October 24, 2012; that review affirmed the need to retain green sturgeon as a threatened species.

Like all sturgeon, North American Green sturgeon are anadromous, long-lived, and a slow growing species (Adams et al. 2002). Along the Pacific Coast, North American Green sturgeon have been documented offshore from Ensenada, Mexico to the Bering Sea, Alaska and found in freshwater rivers from the Sacramento River to British Columbia (Moyle 2002). Two DPS of green sturgeon have been identified along the western coast of North America, and are known to occur in near shore marine waters, and are commonly observed in coastal bays, estuaries, and coastal marine waters from southern California to Alaska (Lindley et. al. 2008). Of the two DPS, only the southern DPS is listed as a threatened species under the ESA. The southern DPS is designated as populations originating from coastal watersheds south of the Eel River where the only known spawning population is in the Sacramento River (50 CFR part 226).

The life cycle of southern DPS green sturgeon can be broken into four distinct phases based on developmental stage and habitat use: (1) larvae and post-larvae less than 10 months of age; (2)

juveniles less than or equal to three or four years of age; (3) coastal migrant females between three or four and thirteen, and males between three or four and nine years of age; and (4) adult females greater than or equal to thirteen years of age and males greater than or equal to nine years of age (Nakamoto et. al. 1995).

Confirmed spawning populations of North American green sturgeon currently are found in only three river systems, the Sacramento and Klamath Rivers in California, and the Rogue River in southern Oregon (Erickson et. al. 2002, Farr and Kern, 2005). During the late summer and early fall, sub-adults and non-spawning adult Green sturgeon frequently can be found aggregating in estuaries along the Pacific coast (Emmett et. al. 1991). Relatively large concentrations occur in the Columbia River estuary, Willapa Bay and Grays Harbor, with smaller aggregations in San Francisco Estuary (Emmett et. al. 1991, Moyle et. al. 1992).

Green sturgeon may migrate long distances upstream to reach spawning habitat. Southern DPS green sturgeon adults typically begin their upstream spawning migrations into the San Francisco Bay by late February to early March, reach Knights Landing by April, and spawn between March and July (Heublein 2006). Peak spawning is believed to occur between mid-April to mid-June and thought to occur in deep, fast water (> 3 m), of large rivers (Emmett et. al. 1991, Adams et. al. 2002). Recent data regarding adult southern DPS green sturgeon has been collected from monitors located from the Golden Gate Bridge to the upper Sacramento River. Some fish that entered the estuary continued to the Sacramento River to spawn. Spawning has been documented on the mainstem over 240 miles upstream, both upstream and downstream of the Red Bluff Diversion Dam (Brown 2007). Based on the distribution of sturgeon eggs, larvae, and juveniles in the Sacramento River, CDFG (2002) indicated that southern DPS green sturgeon spawn in late spring and early summer above Hamilton City possibly to Keswick Dam.

Adults captured in the Sacramento-San Joaquin Delta are known to feed on invertebrates such as shrimp, mollusks, amphipods, and additionally upon small fish (Adams et. al. 2002). Juvenile green sturgeon in the San Francisco Estuary have been shown to feed on opossum shrimp (*Neomysis mercedie*) and amphipods (*Corophium spp*.) (Moyle 2002). Juvenile distribution and habitat use is still largely unknown, and juveniles are presumed present year round in all parts of the San Francisco Bay Estuary (Israel and Klimley 2008).

Waters within the Action Area provide a migratory corridor, and rearing habitat for this species. Spawning habitat is not supported in the vicinity; however, the species may still occur at any time of year while juveniles are foraging. Additionally, the Action Area contains critical habitat for this species.

4.2 General Life History for Chinook Salmon

There are two Evolutionarily Significant Units (ESU) of Chinook salmon designated for protection under the ESA. The Sacramento River winter-run Chinook salmon was reclassified from threatened to endangered by NMFS on January 4, 1994 (59 FR 440) and was reaffirmed as endangered on June 28, 2005 (70 FR 37160). Critical habitat for the species was originally designated on June 16, 1993 (58 FR 33212). The Central Valley spring-run Chinook salmon was listed as threatened by NMFS on September 16, 1999 (64 FR 50394) and was reaffirmed on June 28, 2005 (70 FR 37160). Critical habitat for spring-run Chinook salmon was designated on September 2, 2005 (70 FR 52488).

Chinook salmon runs are designated on the basis of adult migration timing; however, distinct runs also differ in the degree of maturation at the time of river entry, thermal regime and flow characteristics of their spawning site, and actual time of spawning (Myers et al. 1998). Both winter-run and spring-run Chinook salmon tend to enter freshwater as immature fish, migrate far upriver, and delay spawning for weeks or months. For comparison, fall-run Chinook salmon enter freshwater at an advanced stage of maturity, move rapidly to their spawning areas on the mainstem or lower tributaries of rivers, and spawn within a few days or weeks of freshwater entry (Healey 1991). Adult Sacramento River winter-run Chinook salmon enter San Francisco Bay from November through June (Hallock and Fisher 1985), and delay spawning until spring or early summer. Adult Central Valley spring-run Chinook salmon enter the Sacramento Delta beginning in January and enter natal streams from March to July (Myers et. al. 1998). Central Valley spring-run Chinook salmon adults enter freshwater in the spring, hold over summer, and spawn in the fall. Central Valley spring-run Chinook salmon juveniles typically spend a year or more in freshwater before migrating toward the ocean. Adequate in-stream flows and cool water temperatures are more critical for the survival of Central Valley spring-run Chinook salmon due to over-summering by adults and/or juveniles.

Sacramento River winter-run Chinook salmon spawn primarily from mid-April to mid-August, peaking in May and June, in the Sacramento River reach between Keswick Dam and the Red Bluff Diversion Dam. Central Valley spring-run Chinook salmon typically spawn between September and October depending on water temperatures. Chinook salmon generally spawn in gravel beds that are located at the tails of holding pools (USFWS 1995). Eggs are deposited within the gravel where incubation, hatching, and subsequent emergence take place. The length of time required for eggs to develop and hatch is dependent on water temperature, and quite variable. Sacramento River winter-run Chinook salmon fry (newly emerged juveniles) begin to emerge from the gravel in late June to early July and continue through October (Fisher 1994). Central Valley spring-run Chinook salmon fry emerge from November to March and spend about 3 to 15 months in freshwater prior to migrating towards the ocean (Keljson et al. 1981). Post-emergent fry seek out shallow, near shore areas with slow current and good cover, and begin feeding on small terrestrial and aquatic insects and crustaceans.

In the Sacramento River and other tributaries, juveniles often migrate downstream from December through March (Moyle 2002). Fry may spend time rearing within riverine and/or estuarine habitats including natal tributaries, the Sacramento River, non-natal tributaries to the Sacramento River, and the Delta. Within estuarine habitat, juvenile Chinook salmon movements are generally dictated by tidal cycles, following the rising tide into shallow water habitats from the deeper main channels, and returning to the main channels when the tide recedes (Levy and Northcote 1982; Levings 1982; Healey 1991). Juvenile Chinook salmon forage in shallow areas with protective cover, such as intertidal and subtidal mudflats, marshes, channels and sloughs (Dunford 1975).

As juvenile Chinook salmon increase in length, they tend to school in the surface waters of the main and secondary channels and sloughs, following the tides into shallow water habitats to feed (Allen and Hassler 1986). Keljson et al. (1981) reported that juvenile Chinook salmon demonstrated a diel migration pattern, orienting themselves to near shore cover and structure during the day, but moving into more open, offshore waters at night. The fish also distributed themselves vertically in relation to ambient light. During the night, juveniles were distributed randomly in the water column, but would school up during the day into the upper 3 m of the water column. Juvenile Sacramento River winter-run Chinook salmon migrate to the sea after only rearing in freshwater for four to seven months, and occur in the delta from October through early May (CDFG 1998). Most Central Valley spring-run Chinook salmon smolts are present in the delta from mid-March through mid-May depending on flow conditions (CDFG 2000).

Waters of the Action Area provide a migratory corridor and juvenile rearing/foraging habitat for spring-run and winter-run Chinook salmon. Spawning habitat is not supported in the vicinity;

however, each species may still occur seasonally. The Action Area does not contain critical habitat for either ESU of this species.

4.3 General Life History for Steelhead

The Central Valley steelhead was originally designated as threatened by NMFS on March 19, 1998 (63 FR 13347) and was reaffirmed on January 5, 2006 (71 FR 834). Critical habitat for the species was designated on September 2, 2005 (70 FR 52488).

Steelhead are an anadromous form of *Oncorhynchus mykiss*, spending some time in both freshwater and saltwater. The older juvenile and adult life stages occur in the ocean, until the adults ascend freshwater streams to spawn. Unlike Pacific salmon, steelhead are iteroparous, or capable of spawning more than once before death (Busby et al. 1996). Eggs (laid in gravel nests called redds), alevins (gravel dwelling hatchlings), fry (juveniles newly emerged from stream gravels), and young juveniles, remain in freshwater until they become large enough to migrate to the ocean to finish rearing and maturing to adults. General reviews for steelhead in California document much variation in life history (Barnhart 1986, Busby et. al. 1996, McEwan 2001). Although variation occurs, steelhead usually live in freshwater for two years, then spend one or two years in the ocean before returning to their natal stream to spawn.

Steelhead from the tributaries of San Francisco Bay, typically migrate to freshwater between November and April, peaking in January and February. They migrate to the ocean as juveniles from March through June, with peak migration occurring in April and May (Fukushima and Lesh 1998). Steelhead fry generally rear in edgewater habitats and move gradually into pools and riffles as they grow larger. Cover is an important habitat component for juvenile steelhead, both as a velocity refuge and as a means of avoiding predation (Shirvell 1990, Meehan and Bjorn 1991). Steelhead, however, tend to use riffles and other habitats not strongly associated with cover during summer rearing more than other salmonids. Young steelhead feed on a wide variety of aquatic and terrestrial insects, and emerging fry are sometimes preyed upon by older juveniles. Rearing steelhead juveniles prefer water temperatures of 7.2-14.4 degrees Celsius (°C) and have an upper lethal limit of 23.9 °C (Barnhart 1986, Moyle 2002). They can survive in water up to 27 °C with saturated dissolved oxygen conditions and a plentiful food supply. Fluctuating diurnal water temperatures also aid in survivability of salmonids (Busby et. al. 1996).

Juvenile steelhead emigrate episodically from natal streams during fall, winter, and spring high flows. Emigrating Central Valley steelhead use the lower reaches of the Sacramento-San Joaquin Rivers and the Delta for rearing and as a migration corridor to the ocean. Barnhart (1986) reported that steelhead smolts in California range in size from 140 to 210 millimeter (mm) fork length. Juvenile steelhead in the Sacramento River Basin migrate downstream during most months of the year, but the peak period of emigration occurs in the spring, with a much smaller peak in the fall.

Waters of the Action Area provide a migratory corridor as well as juvenile rearing and foraging habitat for this species. Spawning habitat is not supported in the area; however, the species may still occur seasonally. Additionally, the Action Area contains critical habitat for this species.

4.4 General Life History for Delta Smelt

The USFWS proposed to list the Delta smelt as threatened with proposed critical habitat on October 3, 1991 (56 FR 50075). The USFWS listed the Delta smelt as threatened on March 5, 1993 (58 FR 12854), and designated critical habitat for this species on December 19, 1994 (59 FR 65256). The Delta smelt was one of eight fish species addressed in the Recovery Plan for the Sacramento–San Joaquin Delta Native Fishes (USFWS 1995). A 5-year status review of the Delta smelt was completed on March 31, 2004; that review affirmed the need to retain the Delta smelt as a threatened species.

The Delta smelt is a member of the Osmeridae family (northern smelts) (Moyle 2002) and is one of six species currently recognized in the Hypomesus genus (Bennett 2005). The Delta smelt is endemic to the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta) in California, and is restricted to the area from San Pablo Bay upstream through the Delta in Contra Costa, Sacramento, San Joaquin, Solano, and Yolo counties (Moyle 2002). Their range extends from San Pablo Bay upstream to Verona on the Sacramento River and Mossdale on the San Joaquin River. The Delta smelt was formerly considered to be one of the most common pelagic fish in the upper Sacramento- San Joaquin Estuary. While aspects of this species life history are known, certain key components of wild fish, such as spawning habitat requirements and locations are less well known and often inferred by laboratory observations, trawl and sample catch locations of spent females and young larvae, and comparisons with similar species (USFWS 2008).

Delta smelt are euryhaline species that generally occur in water with less than 10-12 parts per thousand (ppt) salinity, although they have been collected in San Pablo Bay at 18.5 ppt and in the Carquinez Strait at 13.8 ppt. Collection activities tend to indicate that Delta smelt can spawn in temperatures ranging from 7 to 22 degrees Celsius. Delta smelt tend to be concentrated near the zone where out flowing fresh water and incoming salt water mix (mixing zone). The species inhabit open surface waters of the Delta and Suisun Bay. Delta smelt are found at all life stages in greatest abundance in the top 2 m of the water column and usually not in close association with the shoreline (USFWS 2004). Delta smelt usually aggregate but do not appear to be a strongly schooling species. Genetic analyses have confirmed that *H. transpacificus* presently exists as a single intermixing population (Trenham et al. 1998).

Spawning occurs in shallow water habitats in the Delta. Adult smelt migrate upstream from brackish water habitat associated with the mixing zone before spawning to disperse into river channels and tidally influenced backwater sloughs. The spawning season varies from year to year, between late winter (December) to early summer (July). Laboratory observations have indicated that Delta smelt are broadcast spawners with sinking (demersal) eggs with adhesive properties. It is postulated that the eggs sink and attach to substrates like tules, tree roots and other submerged vegetation in shallow waters (USFWS 2004). Newly hatched and juvenile Delta smelt forage in shallow waters until they reach 16 to 18 millimeter (mm) in length. Once they develop a swim bladder, they rise up higher into the water column and are washed downstream into the mixing zone. By August juvenile smelt are typically 40-50 mm (USFWS 2004).

Delta smelt feed on planktonic copepods, small crustaceans, amphipods, and to a lesser extent insect larvae. They are fed upon by subadult striped bass (*Morone saxatilis*) and have been found in the stomach contents of black crappie (*Pomoxis nigromaculatus*) and white catfish (*Ameiurus catus*) (USFWS 2004).

This species is known to occur in waters of the Action Area; however, shallow water spawning habitat does not occur in or adjacent to the Action Area. Water depths at the wharf range between 2.9 m (9.8 ft) to more than 9 m (29.7 ft), with the majority of the project site being approximately 4.7 m (15.5 ft) below MLLW (COWI 2017). Similar and deeper water depths are present throughout the Action Area, with no substantial shallow water spawning habitat know to be present. The Action Area provides foraging habitat for adult and juvenile Delta smelt. Additionally, the Action Area contains critical habitat for this species.

4.5 General Life History for Longfin Smelt

On August 8, 2007 the USFWS was petitioned to add the longfin smelt to the list of Threatened and Endangered Species. During the most recent review by the USFWS it was determined that the San Francisco Bay-Delta DPS of longfin smelt warranted protection under the Endangered Species Act. However, the USFWS has not yet listed the species, and it remains a candidate species at the federal level (USFWS 2013).

The longfin smelt is an anadromous fish found in California's bay, estuary, and nearshore coastal environments. The range of longfin smelt extends along the Pacific coast of North America from the Sacramento-San Joaquin estuary in California, north to the Gulf of Alaska. Outside of California the species primarily exists in scattered and isolated bays or estuaries (Moyle 2002). The San Francisco Estuary supports the southern-most longfin smelt population, and the largest population in California (Moyle 2002). Longfin smelt are known to inhabit the entire San Francisco Estuary, including portions of the Napa River, Suisun and Napa marshes, and the Sacramento-San Joaquin Delta (CDFW 2009).

This species is a member of the Osmeridae family (Moyle 2002). Most notably, they are distinguished from other smelts by the large pectoral fins for which they are named. Lifespan of the species is generally two years, but three-years-old smelt have been observed (CDFW 2009). Longfin smelt reach 6-7 centimeter (cm) in the first 9-10 months of life. Growth is minimal during their first winter, but the growth rate increases again in their second summer and fall when they reach 9-11 cm. The largest members of the species are female fish that may reach up to 15 cm in their third year (Calfish 2018).

The species can tolerate salinities ranging from freshwater to nearly pure seawater. Most longfin smelt occupy the middle or bottom of a water column and tend to favor temperatures in the range of 16-18°C and salinities ranging from 15-30 ppt (Calfish 2018). While longfin smelt encounter a wide variety of water temperatures, and salinities during their life cycle, they are rarely found in water temperatures greater than 22°C (CDFW 2009). Their spatial distribution within a bay or estuary is seasonally variable based on these temperature and salinity tolerances. Longfin smelt can also make daily migrations; remaining deep during the day and rising to the surface at night. Avoiding surface waters during the day helps them avoid predation from birds, marine mammals, and other fish (Calfish 2018). Generally speaking longfin smelt are found closer to the ocean during summer and move into streams during winter months for spawning (Baxter 1999).

Spawning occurs between February and April when fish move into freshwater streams and rivers (Calfish 2018). Spawning areas are generally gravel or sandy substrate where rocks and aquatic plants are present. Spawning occurs at night, and after fertilization, the eggs adhere to plants and gravel in the area. Eggs typically hatch at around 40 days. Winter and spring outflows transport recently hatched larvae downstream to Suisun Bay, San Pablo Bay, and San Francisco (Baxter 1999).

As juveniles longfin smelt feed on copepods and cladocerans. With subsequent growth their diet expands to include mysids and amphipods (CDFW 2009). Longfin smelt are an important prey species and are fed upon by many species of predatory fish. However, striped bass (*Morone saxatilis*) are a dominant predator of longfin smelt in the San Francisco Bay area (CDFW 2009). The other primary threats to the San Francisco Bay population are due mainly to the effects of water diversions from the Delta (Moyle 2002).

This species is known to occur in waters of the Action Area; however, sandy shallow water spawning habitat does not occur in or adjacent to the Action Area. The Action Area provides habitat for juvenile rearing and adult migration. Critical habitat for this species has not been designated.

5.0 MANNER IN WHICH ACTION MAY AFFECT SPECIES AND CRITICAL HABITAT

The proposed Action is likely to adversely affect listed species that may be within the Action Area. The proposed Action is not likely to destroy or adversely modify critical habitat within the Action Area.

5.1 Analysis of Effects to Listed and Candidate Species

The following section provides an analysis of potential effects from the proposed Action on listed and candidate species.

5.1.1 Analysis of Direct Effects to Fish

Direct effects are those effects caused directly by the proposed Action that occur on-site within the Action Area and during Action implementation, i.e., disturbance within the Action Area.

Pile driving produces underwater noise, which manifests as pressure waves in the aquatic environment. In order to evaluate the potential effect to fishes exposed to elevated levels of underwater sound produced during pile driving, WRA analyzed data from a nearby pile driving project which installed similar size piles, as well as incorporating results of measurements from similar projects elsewhere, along with the thresholds established by California Department of Transportation (Caltrans) and NMFS.

This assessment estimates the levels of underwater sound (peak, root mean square [RMS] pressure, and accumulated SEL) received by fishes that are exposed to elevated levels of underwater sound produced during pile driving. Distance from each pile that the sound attenuates to threshold levels was determined, and the sound impact was used to compute effects to fish species that are presumed stationary. Sound levels for attenuated steel piles, and unattenuated concrete piles are addressed below, along with specific distances within which specific thresholds are exceeded. Based on past projects, it is estimated that sound levels can be reduced up to 10 dB using a properly deployed bubble curtain device (Illingworth & Rodkin 2014). Effects are addressed as a condition where fish are assumed to be stationary relative to the pile driving.

In general, species of herring, croakers, and shad are hearing specialists while most other fish are hearing generalists (ICF Jones and Stokes, and Illingworth and Rodkin, Inc., 2009). Sound specialists are likely to be affected by sound to a greater degree than sound generalists, and smaller fish are generally more susceptible to injury from sound than larger fish (ICF Jones and Stokes, and Illingworth and Rodkin, Inc. 2009). As such, the effects that are presented in this section are presumably higher than those that will actually occur during Action activities because:

a) impact calculations were determined using small and stationary fish in order to calculate a maximum potential impact area;
b) several of the listed fish species that may occur in the Action Area use the waters seasonally as a migratory corridor or for rearing habitat and not spawning (i.e. not stationary); and
c) currents and flow within the Action Area are not conducive to fish remaining stationary where accumulated sound effects can readily injure or stun fish.

The criteria used for the onset of physical injury and adverse behavioral effects are listed in Table 5. The onset of physical injury uses dual criteria - peak pressure and SEL. The onset of physical injury is expected if either of these criteria are exceeded. The criterion for accumulated SEL is based upon the mass of the fishes under consideration. Because Delta smelt and longfin smelt are known to occur within the Action Area, the more conservative 183 dB SEL criterion, which applies when fish smaller than 2 grams are present, may be required.

Table 5. Fish Impact Criteria

Effect	Metric	Fish mass (grams)	Threshold
Onset of physical injury	Peak pressure	N/A	206 dB (re: 1 µPa)
	Accumulated SEL	≥ 2 g	187 dB (re: 1µPa^2•sec)
		< 2 g	183 dB (re: 1µPa^2•sec)
Adverse behavioral effects	RMS	N/A	150 dB (re: 1 µPa)

The extent of sound levels anticipated for the Action are expected to be similar to those measured at the Georgia Pacific (GP) Antioch Wharf Replacement Project, located approximately 1-mile west of the Project Area within the same section of the River (Illingworth and Rodkins 2017). Results of acoustic monitoring for impact hammer driving of piles of equal size to those used for this Action are listed below in Table 6.

In addition to six steel shell piles, the Action will drive 47, 24 inch octagonal concrete piles to support the RoRo ramp and associated fenders. Data for 24 inch concrete piles is presented below in Table 7 and was obtained from the Caltrans Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish (Caltrans 2015). Data shown below in Table 7 is for unattenuated driving (i.e. no bubble curtain or other sound dampening devices were used).

Table 6. Measured Sound Pressure Levels from Impact Driving of Steel Shell Piles at the GP Antioch Wharf Project

Pile Size	Pile Strikes	Distance (Meters)	Peak (Maximum)	RMS (Average)	SEL (Cumulative)
72 inch steel shell	1,649	10	205*	189	211
		260	184	168	194
72 inch steel shell	1,389	10	206*	189	209
		300	-[1]	-[1]	-[1]
72 inch steel shell	1,621	10	203*	185	208
		150	188	171	191
72 inch steel shell	1,015	10	204*	188	207
		200	185	168	186

* - Measurements collected while driving with a bubble curtain.
[1] – Hydrophone inoperable

Table 7. Measured Sound for Projects Driving Various 24-inch Concrete Piles

Pile Type	Project	Peak (10 m)	RMS (10 m)	SEL (10 m)
24-inch octagonal concrete	Port of Oakland Berth 22	188	176	-A
24-inch octagonal concrete	Port of Oakland Berth 22	187	174	165
24-inch octagonal concrete	Port of Oakland Berth 22	186	175	164
24-inch octagonal concrete	Port of Oakland Berth 22	188	176	166
24-inch octagonal concrete	Port of Oakland Berth 32	185	173	162
24-inch octagonal concrete	Port of Oakland Berth 32	185	173	163
24-inch octagonal concrete	Port of Oakland Berth 32	184	174	161
24-inch octagonal concrete	Port of Oakland Berth 32	185	173	163
24-inch octagonal concrete	Port of Oakland Berth 32	185	173	161

A- Single strike SEL's below 150 dB do not accumulate to cause injury to fish.

Using the above information, the following estimates of distance to the accumulated 187 dB and 183 dB SEL level are provided in Table 8.

Table 8. Sound Levels at 10 meters and Distances to the 187 dB and 183 dB Cumulative SEL Criterion for Pile Driving [3].

Pile Size and Type	Estimated Strikes	Attenuation	Single Strike Peak*	Single Strike RMS*	Single Strike SEL*	Cumulative SEL (dB) at 10 m	Distance to 187 dB Cumulative SEL (m)	Distance to 183 dB Cumulative SEL (m)
72-inch steel shell pile	1,600	bubble curtain, metal cushion block	206	188	176	208	253	470
24-inch octagonal concrete	500	Unattenuated	187	175	165	190	16	29
*= measurements at 10 m.								

The Peak values observed at 10 m for a single strike on the GP Antioch Wharf Project while driving 72-inch steel shell piles, did not surpass the 206 dB threshold except during adjustments to the bubble curtain when driving the first pile. Once adjustments were satisfactory, impact hammer driving of 72-inch steel piles produced Peak sounds at 203-206 dB (Illingworth and Rodkin 2017). Therefore, direct mortality to fish from pile driving is not anticipated from a single blow as long as the bubble curtain is deployed and operational. Cumulative SEL at 10 m for 72-inch piles was between 207 and 211 dB (Table 7, Illingworth and Rodkin 2017). Given the values observed at the Antioch Wharf project, cumulative SEL at 10 m will surpass the 183 dB injury threshold for fish under 2 grams, potentially causing mortality to fish within that range. However, prior to beginning pile driving with impact hammers on 72-inch steel piles, a prolonged period of use with a vibratory hammer (approximately 30 minutes), as well as a soft start will be employed to allow fish an opportunity to escape the immediate surrounds of the pile, thereby minimizing potential for mortality. Additionally, it is unlikely that a stunned fish would remain stationary and subject to the full breadth of sound pressure accumulation effects, given the swift currents within the Action Area.

Using data for the 72-inch steel shell piles at the GP Antioch wharf project (driven with the use of a bubble curtain), and assuming the maximum number of strikes by an impact hammer to drive a pile on that project (1,600 strikes), the 183 dB Cumulative SEL was estimated at 470 m (1,542 ft) using the NMFS pile driving calculator (Appendix D). Observed values at the GP Antioch wharf project shown in Table 5 reported cumulative SEL at various distances. The furthest cumulative SEL reading was at a distance of 260 m (853 ft) and registered at 194 dB. Given the 260 m distance is only 10 dB above the 183 dB threshold, it is assumed that the 470 m distance to the 183 dB threshold is appropriate. The 470 m distance represents an Acoustic Impact Area (Figure 5). Any fish within that area would be subject to direct effects, or cumulative SEL impacts, of between 183 and 187 dB. Using the NMFS pile driving calculator, the distance to where adverse behavioral effects may occur would extend 3,400 m from the largest piles being driven. The 3,400 meter range represents the full extent of the Acoustic Action Area, as fish outside of this range are not anticipated to be effected in any way.

In addition to the sound attention devices (bubble curtain) for the driving of steel piles, a soft start will be used at the start of each day when pile driving occurs or following a break of one

[3] Calculated using the NMFS Pile Driving Calculator. Worksheets for calculations are included in Appendix D.

hour or longer in pile driving. The soft start involves the gradual increase of energy and frequency of impacts to permit wildlife to vacate the surrounding area. Because special-status fish within the Action Area will be mobile juveniles or adults (as opposed to eggs or larvae, which tend to be subject to drift and are not freely mobile), they will have the opportunity to vacate the Acoustic Impact Area before peak sound levels occur.

Utilizing the outlined avoidance and minimization levels is anticipated to reduce sound levels during impact driving of 72-inch steel piles to levels at or below the 206 dB peak criteria for the majority of work. However, the 206 dB threshold may be surpassed within 10 m of 72-inch piles, or during installation of the first pile as adjustments are made to the bubble curtain and the hammer. The cumulative SEL is also anticipated to exceed the 183 and 187 dB criteria. These effects are primarily focused on the installation of 72-inch steel piles. To reduce the effect of any exceedance the cumulative SEL will have, installation of 72-inch steel shell piles shall be restricted to an environmental work window of August 1 to November 30. The work window is informed by NMFS, USFWS, and CDFW recommendations for avoidance of potential impacts to fish species in this region of the San Francisco Bay Delta. In-water work conducted within the work window will minimize the possibility that work activities will affect fish as listed fish species are less likely to utilize the Action Area for rearing or migration during this period, and are also unlikely to occur in a more sensitive life stage (i.e. egg or larvae). Additionally, hydroacoustic monitoring will be conducted during pile driving activity to identify any exceedance in threshold levels potentially affecting listed fish. Direct biological observation during pile driving is not practical for this location. If any fish are directly impacted by pile driving, the currents would carry injured or dead fish away from the injury location in a swift an unpredictable manner, and it is extraordinarily unlikely that a stationary biological monitor would be able to observe the injured or dead fish. Mobile methods for directly assessing fish injury and mortality as a result of pile driving (e.g., trawl surveys) are more likely to result in direct effects to captured fish that exceed the effects that they would otherwise be exposed to absent the implementation of that monitoring. Mobile methods may have greater coverage, but are also not guaranteed to capture potentially injured or dead fish.

For the installation of concrete piles the analysis shows that 24-inch concrete piles are not expected to create sound levels in excess of 206 dB either through a single strike, or through cumulative SEL. Additionally, concrete piles are only expected to produce a maximum of 187 dB Peak sound during installation. This sound level would be attenuated to 183 dB or less within 29 m (94 ft). The area affected by such sound levels falls within the shadow of the derrick barge performing the work. Typical derrick barges measure 145 to 250 ft in length, and 60 to 100 feet in width (Manson Construction Company 2018). Because sound pressure levels for mortality will never be reached, and SEL levels sufficient to potentially cause injury are less then the area occupied by the barge doing the work, driving concrete piles is unlikely to cause injury to protected fish. Therefore, an extended work window for driving concrete piles from July 1 – November 30 is not likely to cause additional impacts to protected fish.

Based on the hydroacoustic assessment, and the minimization measures, temporary direct effects to listed fish are estimated from the **maximum** hydroacoustic impact (using highest sound pressure levels) as follows:

- Fish within 3,400 m (Action Area) would be exposed to RMS sound levels of 150 dB.
- Any fish in the Acoustic Impact Area of 470 m (1,527 ft) will be subject to direct effects, or cumulative SEL impacts at or above 183 dB when driving 72-inch steel piles.
- Fish within 29 m (94 ft) will be subject to cumulative SEL impacts at or above 183 dB when driving 24-inch concrete piles.

- Fish within 10 m (33 ft) of pile driving for 72-inch steel piles may be exposed to peak sound levels above 206 dB.

These direct effects from pile driving activity are anticipated to be temporary, and no ongoing or permanent adverse effects are anticipated.

Additional in-water work for the removal of existing piles, along with the deployment of spuds from the barge, may contribute to increased water turbidity and mobilization of substrate. Elevated turbidity can impair gill function, reduce oxygen availability in the water column, decrease physiological capabilities, and increase stress in fish (Heath 1995). The increase in turbidity is anticipated to be localized and dissipate quickly due to tidal currents and river flow conditions. Activities that may result in temporary increases in turbidity are likely to occur with other forms of disturbance or sound generation, such as the movement of tugs and barges. These disturbances are likely to cause fish to move away from the areas where increases in turbidity would occur, prior to directly being exposed to the turbidity.

While turbidity can impact sensitive life stages of fish, elevated turbidity alone does not represent a uniform impact to protected fish species. Delta smelt distribution has been correlated with turbidity which can help increase foraging efficiency and decrease predation threat (Interagency Ecological Program 2015). Within the Delta, turbidity is generally between 20-40 nephelometric turbidity units (NTUs), and can increase to as high as 250-500 NTUs during high river flows (California Department of Water Resources 2013). The actual distance suspended sediment caused by the Project would move is dependent upon multiple factors (i.e. tide, river flow, wind condition, etc.) and turbidity from pile removal and vibratory driving is anticipated to be confined within 45.7 m (150 ft) of the pile and would likely dissipate within five minutes (USFWS 2013). For much more sediment intensive activities, like clamshell dredging, turbidity generally extends a maximum of 304 m (1,000 ft) at the surface and 457 m (1,500 ft) near the substrate when using ineffective equipment (Long Term Management Strategy 2009). Turbidity from such activities also typically dissipates into background levels within a single tidal cycle (Long Term Management Strategy 2009). Any area of potential turbidity increase is well within the 3,400 m Action Area, and is anticipated to occur within less than 10% of the area identified with the 470 m Acoustic Impact Area (Figure 5). Turbidity may result in areas such as the shallow water habitat between the wharf and the shoreline, being temporarily unsuitable for fish. Restricting in-water work to the approved work window will reduce the potential for sensitive life stages of listed fish to occur or be affected by Project generated turbidity. Additionally, all water quality protection requirements identified by the Regional Water Quality Control Board in the 401 certification for the Project will be followed.

Above-water work for the demolition and construction of the wharf will involve welding, drilling, and associated construction related activity. Such activities are expected to contribute minimally to hydroacoustic direct effects. The sound produced by this type of activity is likely to be deadened as the sources will be out of the water, and is typically not a high pressure sound wave such as those produced by an impact hammer. To minimize potential adverse effects from demolition and construction, worker environmental awareness training and BMPs including a debris containment boom and spill prevention kits will be used. Above-water work will be temporary, and is not anticipated to result in any adverse effects to listed fish.

5.1.2 Analysis of Indirect Effects to Fish

Indirect effects are those caused by or those that will result from the proposed Action later in time and outside the Action Area, but are still reasonably certain to occur.

The Action will result in a change in wharf size and use, but no barriers to fish migration will be created, and no toxic effects to waterways are anticipated. The wharf design will use steel or concrete piles to support the structures, avoiding use of any toxic materials. Additionally, any impacts to foraging efficiency by various species in the vicinity due to increased shading will be offset by the purchase of mitigation credits, removal of toxic (creosote) piles that currently occur in the Project Area, and by the addition of grated walkways and surfaces that will allow previously shaded areas to be illuminated. Therefore, because of these design features, no indirect effects are anticipated by the Action.

5.1.3 Analysis of Interrelated and Interdependent Effects to Fish

Interrelated actions are those actions that are part of the primary action and dependent upon that primary action for their justification.

In its current state, the wharf is unusable. General degradation of the structure over time does not allow for safe berthing of ships, and as such, use of the wharf has not been possible for several years. Once the wharf is rehabilitated, it will go back into regular service as ship traffic will be able to safely berth at the wharf again. Ships which will use the wharf are of similar size to those currently using the San Joaquin River or Sacramento River in route to the Ports of Stockton and Sacramento. Ships are anticipated to vary in length from 550 to 650-feet with a 90 to 110-foot wide beam, and up to a 30-foot draft. Because the adjacent San Joaquin River is maintained as a commercial channel for the Port of Stockton, this limits the draft for vessels that can access the area. No increase in dredging depth is anticipated to occur as a result of the Action as the ships calling on the berth are of similar size to those that already call upon ports upstream. Additionally, maintenance dredging is not anticipated to be required as depths are already sufficient to handle any anticipated ships calling on the wharf. Uplands within the Action Area are currently being used as storage for large numbers of vehicles which are parked, and operated on gravel or blacktop lots throughout the Action Area. These vehicles are continually being moved, maintained and shipped out according to varying needs. The presence of several thousand automobiles being parked, and operated provides a nearly continual source of anthropogenic disturbance throughout the uplands. Because this type of disturbance is already present throughout the uplands, any future use of the upland portions of the site would be expected to maintain a similar level of activity causing similar conditions (e.g. dust, or noise) to those that currently exist. Because additional effects due to dredging are not anticipated and extant disturbance within the uplands is extensive, interrelated or interdependent effects to these areas are not expected to change as a result of the Action. The only anticipated interrelated action will be an increase in vessel traffic.

The Port of Stockton services approximately 275 ships per year and is currently the fourth largest port in California (Port of Stockton 2018). Additionally, the junction of the Sacramento River which services the Port of Sacramento is located approximately 6-river miles west of the Action Area (downstream). The Port of Sacramento services an additional 60 to 80 vessels per year (Port of Sacramento 2018). Given the level of traffic at these two ports, it is not anticipated that ships using the AMPORTS facility will add significantly to the number of ships using the area. During high volume periods when multiple or large contracts are active it is anticipated that as many as six to eight ships per month may use the wharf. Ships are anticipated to be at the berth for approximately 24-hours and would then depart the area. Given the already high volume of ships moving both upstream, and downstream of the Action Area, the level of traffic is not anticipated to add significantly to the general commercial traffic in the vicinity.

Interdependent actions are those actions that have no independent utility apart from the primary action. Construction, maintenance, and use of a road required to access a site is an example of an interdependent effect. Increased boat traffic around the wharf will result as part of the Action during construction. Work boats and material barges will be used to perform the Action. Effects from the use of work boats and material barges will last for the duration of the Action. Acoustic effects from the use of work boats and material barges are anticipated to be minimal, and are adequately captured in the Action Area as depicted. No additional interdependent effects are expected as a result of the Project because all construction and activities are considered under the primary Action.

5.1.4 Analysis of Cumulative Effects to Fish

Cumulative effects are those effects of future state or private activities, not involving federal activities, that are reasonably certain to occur within the action area of the federal action subject to consultation {50 CFR §402.02}. Future dredging or new dock projects would be considered cumulative effects.

Following rehabilitation of the wharf, the number of vessels using the wharf is anticipated to increase, however this effect has been analyzed as an interrelated effect because it is dependent upon the primary action for justification. No additional dredging is required as waters along the berth side of the wharf are of sufficient depth to accommodate the anticipated ships. There are also no currently proposed non-federal actions in the Action Area. Therefore, no cumulative effects are anticipated to occur.

5.2 Analysis of Effects to Critical Habitat

The following section provides an analysis of potential effects from the proposed Action on critical habitat.

5.2.1 Analysis of Direct Effects

Direct effects are those effects caused directly by the proposed Action that occur on-site within the Action Area and during Action implementation, i.e., ground disturbance within the Action Area. The proposed Action will affect critical habitat for green sturgeon, Central Valley steelhead, and Delta smelt.

The proposed Action will require the removal of 128 existing creosote treated piles and replacement with 82 HDPE, steel, and concrete piles. The new piles will result in a net decrease of 46 piles and removal of any exposed creosote piles from the wharf. However, the new piles will result in an increase of 220 cubic yards of fill (Table 7). In addition, the construction of the RoRo ramp, walkways and extension will result in an increase in shading of 9,228 square feet (Table 8). This impact will result in the loss or reduction in one or more Physical and Biological Elements of critical habitat for all three species. This Action will not result in impact to spawning habitat for these species as not suitable spawning habitat for any species is present.

Removal of the 128 timber piles will benefit critical habitat as removing these piles will reduce the amount of creosote leaching into San Joaquin River and the downstream San Francisco Bay-Delta (Werme et al 2010). During the construction process, sections of solid decking currently in existence will be removed and replaced with light penetrating surfaces (grated cover) totaling 667 square feet. Following the completion of the Project, and addition of proposed structures such as the RoRo ramp, the Action will result in a net increase in shading of 9,228 sq. feet (0.20 acres). To offset impacts for shading, the Applicant will purchase 0.20 acre of mitigation at an approved bank (e.g. Liberty Island or other such appropriate bank). Following purchase of credits at an approved mitigation bank, removal of creosote piles from the

San Joaquin River, and addition of light penetrating surfaces, the Action will mitigate all direct effects on critical habitat for green sturgeon, steelhead and Delta smelt.

5.2.2 Analysis of Indirect Effects

Indirect effects are those caused by or those that will result from the proposed Action later in time or outside the Action Area, but are still reasonably certain to occur.

No creosote or other toxic substances will be introduced as part of the new wharf components. Any steel components within the splash zone of the wharf will have coatings or galvanization to protect them from corrosion. Indirect effects will not adversely affect critical habitat as a result of the Action.

5.2.3 Analysis of Interrelated and Interdependent Effects

Interrelated actions are those actions that are part of the primary action and dependent upon that primary action for their justification. The only interrelated effect anticipated would be an increase in ship traffic following completion of the wharf.

In its current state the wharf is unusable. Once the wharf is rehabilitated, it will go back into regular service. Ships which will use the wharf are of similar size to those currently traveling through the area in route to the Ports of Stockton and Sacramento. Because the San Joaquin River is already maintained as a commercial channel for the Port of Stockton, and depths are sufficient to handle the ships anticipated to call on the wharf, dredging is not anticipated to be required as a result of the Action. Therefore, it is anticipated that the only interrelated effect will be an increase in vessel traffic. The combined traffic for the Port of Stockton and Port of Sacramento is estimated to be around 350 ships per year. The number of ships estimated to use the wharf is anticipated to peak at eight vessels per month. The number of vessels already using the two major ports far exceeds the numbers of ships expected to use the wharf. Additionally multiple marinas in the vicinity harbor several hundred personal watercraft which travel through the area daily. Therefore, given the number of heavy ships entering the Port of Stockton via the San Joaquin River, and the high number of personal watercraft harbored in the vicinity, it is not anticipated that the numbers of ships using the AMPORTS facility, even at full capacity would add significantly to disturbance in the vicinity.

Interdependent actions are those actions that have no independent utility apart from the primary action. Construction, maintenance, and use of a road required to access a site is an example of an interdependent effect.

Increased boat traffic around the wharf will result as part of the Action during construction. Work boats and material barges will be used to perform the Action. Effects from the use of work boats and material barges will last for the duration of the Action. Acoustic effects from the use of work boats and material barges are anticipated to be minimal, and are adequately captured in the Action Area as depicted. No interdependent effects are expected as a result of the Action because all construction and activities are considered under the primary Action.

5.2.4 Analysis of Cumulative Effects

Cumulative effects are those effects of future state or private activities, not involving federal activities, that are reasonably certain to occur within the action area of the federal action subject to consultation {50 CFR §402.02}. Future dredging or new dock projects would be considered cumulative effects.

Following rehabilitation of the wharf, the number of vessels using the wharf is anticipated to increase, however this effect has been analyzed as an interrelated effect because it is dependent upon that primary action for justification. No additional dredging is required as waters along the berth side of the wharf are already sufficient depth to support berthing by large ships. There are also no currently proposed non-federal actions in the Action Area. Therefore, no cumulative effects are anticipated to occur.

6.0 DETERMINATION OF EFFECT

The cumulative SEL arising from the construction aspects of the Action is anticipated to exceed the 183 and 187 dB criteria and as such could result in harm to fish species within the Action Area. Through an analysis of the biological resources within the Action Area, the Applicant has developed avoidance and minimization measures for the Action that minimize impacts to federally-listed fish species within the Action Area. These species include: Central Valley steelhead, winter and spring-run Chinook salmon, green sturgeon, delta smelt and longfin smelt. Numerous protection measures have been incorporated into the proposed Project design. Thus, while the proposed Action may affect and is likely to adversely affect listed fish species in the Action Area, the implementation of the proposed measures described above will greatly minimize the potential impacts, including the potential for take occurring.

The Action will result in an increase in shade by 9,228 square feet and will add 220 cubic yards of in-water fill. Through the removal of creosote treated piles, use of work windows and purchase of mitigation credits, impacts to critical habitat for Central Valley steelhead, southern DPS green sturgeon, and Delta smelt are not likely to adversely modify or destroy critical habitat for these species.

Due to several factors including a lack of suitable habitat within the Action Area, it was determined that the proposed Project would not affect salt-marsh harvest mouse, San Joaquin kit fox, American peregrine falcon, bald eagle, California brown pelican, California least tern, California Ridgway's rail, Western snowy plover, Alameda whipsnake, California red-legged frog, California tiger salamander, giant garter snake, Chinook salmon – Central California Coast, Coho salmon, Callippe silverspot butterfly, conservancy fairy shrimp, Delta green ground beetle, longhorn fairy shrimp, Lange's Metalmark Butterfly, San Bruno elfin butterfly, valley elderberry longhorn beetle, vernal pool fairy shrimp, vernal pool tadpole shrimp, Antioch Dunes evening primrose Colusa grass, Contra Costa goldfields Contra Costa wallflower, Keck's checker-mallow, large-flowered fiddleneck, or. Soft bird's beak.

7.0 REFERENCES

Adams, PB, CB Grimes, ST Lindley, and ML Moser. 2002. Status review for North American green sturgeon, *Acipenser medirostris*. NOAA, National Marine Fisheries Service. Southwest Fisheries Science Center, Santa Cruz, CA. 50 pp.

Allen, MA, and TJ Hassler. 1986. Species Profiles: Life Histories and Environmental Requirements of Coastal Fishers and Invertebrates (Pacific Southwest), Chinook salmon. U.S. Fish and Wildlife Service. BiotogiClll Report 82 (11.49).

Barnhart, RA. 1986. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (pacific Southwest), steelhead. United States Fish and Wildlife Service Biological Report 82 (11.60).

Baxter, RD. 1999. Osmeridae. Pages 179-216 in J. Orsi, editor. Report on the 1980-1995 fish, shrimp and crab sampling in the San Francisco Estuary. Interagency Ecological Program for the Sacramento-San Joaquin Estuary Technical Report 63.

[BCG] Ben C. Gerwick, Inc. 2014. Breasting Dolphin Replacement Project Basis of Design. Oakland, California.

Bennett, WA. 2005. Critical assessment of the Delta smelt population in the San Francisco Estuary, California. San Francisco Estuary and Watershed Science [Internet] 3(2) Available at: http://repositories.cdlib.org/jmie/sfews/vol3/iss2/art1. Accessed: June 2018.

Brown, K. 2007. Evidence of spawning by green sturgeon, *Acipenser medirostris*, in the upper Sacramento River, California. Environmental Biology of Fishes 79:297-303.

Busby, PJ, TC Wainwright, GJ Bryant, LJ Lierheimer, RS Waples, FW Waknitz, and IV Lagomarsino. 1996. Status Review ofWest Coast Steelhead from Washington, Idaho, Oregon, and California. National Marine Fisheries Service, August 1996. NOAA Technical Memorandum, National Marine Fisheries Service-NWFSC-27.

Calfish. 2018. California Fish Species: Longfin Smelt *Spirinchus thaleichthys*. Available at: http://calfish.ucdavis.edu/species/?ds=241&uid=48. Accessed: August 2018.

[CDFG] California Department of Fish and Game. 1998. A report to the Fish and Game Commission: A status review of the spring-run Chinook (*Oncorhynchus tshawytscha*) in the Sacramento River drainage. Candidate Species Status Report 98-01. June 1998.

CDFG. 2000. Spring-run Chinook salmon annual report. Prepared for the California Fish and Game Commission. Habitat Conservation Division, Native Anadromous Fish and Watershed Branch. Sacramento, 19 pages.

CDFG. 2002. California Department of Fish and Game comments to NMFS regarding green sturgeon listing.

[CDFW] California Department of Fish and Wildlife. 2009. A status review of the longfin smelt (*Spirinchus thaleichthys*) in California. Available at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=10263. Accessed: July 1, 2018.

CDFW. 2018. California Natural Diversity Database. Wildlife and Habitat Data Analysis Branch. Sacramento, CA. Accessed: June 2018.

California Department of Transportation. 2015. Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish. November. Available at: http://www.dot.ca.gov/hq/env/bio/files/bio_tech_guidance_hydroacoustic_effects_110215.pdf. Accessed: June 2018.

California Department of Water Resources. 2013. Appendix 5H – Aquatic Construction and Maintenance Effects. Bay Delta Conservation Plan. Public Draft. November. Sacramento, CA. Prepared by ICF International (ICF 00343.12). Sacramento, CA.

California Laboratory Services. 2018. AMPORTS Antioch sampling results memorandum. May 16.

[COWI] AMPORTS, Antioch California Multibeam Survey. 2017. COWI Marine Bathymetric Survey Results. Oakland California.

Dunford, WE. 1975. Space and food utilization by salmonids in marsh habitats in the Fraser River Estuary. M.S. Thesis. University of British Colombia, Vancouver, B.C.. 81 pp.

Emmett, RL, SA Hinton, SL Stone, and ME Moncao. 1991. Distribution and abundance of fishes and invertebrates in West Coast estuaries, Volume Il: Species life history summaries. ELMR Report NO.8. NOAAlNOS Strategic Environmental Assessments Division, Rockville, MD. 329pp.

Erickson, DL, JA North, JE Hightower, J Weber, and L Lauck. 2002. Movement and habitat use of green sturgeon Acipenser medirostris in the Rogue River, Oregon, USA. Journal of Applied Icthyology 18:565~569.

Farr, R.A, and JC Kern. 2005. Green sturgeon population characteristics in Oregon. Final progress report. Sport Fish Restoration Project F-178-R, Oregon Department of Fish and Wildlife, Portland, Oregon. 73 pp.

Fisher, FW. 1994. Past and Present Status of Central Valley Chinook salmon. Conservation Biology 8(3):870-873.

Fukushima L, and EW Lesh. 1998. Adult and juvenile anadromous salmonid migration timing in California streams. California Department of Fish and Game 84(3): 133-145.

Hallock, RJ and FW Fisher. 1985. Status of Winter-run Chinook salmon, Oncorhynchus tshawytscha, in the Sacramento River. Anadromous Fisheries Branch, California Department of Fish and Game. January 25, 1985.

Healey, MC. 1991. The life history of Chinook salmon (Oncorhynchus tshawytscha). Pages 311393 In: C. Groot and L. Margolis (eds.), Life history of Pacific salmon. University of British Columbia Press, Vancouver, British Columbia.

Heath, AG. 1995. Water pollution and fish physiology. Second Edition. CRC Press Inc. Boca Raton, Florida.

Heublin, J.C. 2006. Migration of Green sturgeon (Acipenser mediroSlris) in the Sacramento River. Masters Thesis. San Francisco State University. 63 pp.

ICF Jones and Stokes, and Illingworth and Rodkin, Inc. 2009. Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish.

Illingworth & Rodkin, Inc. 2014. Georgia-Pacific Antioch Terminal Breasting Dolphin Replacement Project Underwater Noise Assessment. Marysville, California.

Illingworth & Rodkin, Inc. 2017. Final Report: Pile-Driving Noise Measurements at Georgia Pacific Antioch Breasting Dolphin Replacement Project: 02 October 2017–10 October 2017.

Interagency Ecological Program. 2015. An updated conceptual model of Delta smelt biology: our evolving understanding of an estuarine fish. Technical Report 90.

Israel, JA, and AP Klimley. 2008. Life History Conceptual Model for North American green Sturgeon (Acipenser medirostris). University of California, Davis.

Keljson, MA, PF Raquel, and FW Fisher. 1981. Life history of fall-run juvenile Chinook salmon (Oncorhynchus tshawytscha) in the Sacramento-San Joaquin Estuary. In R.D. Cross and D.L. Williams (editors), Proceedings of the National Symposium on Freshwater Inflow to Estuaries, pages 88-108. U.S. Fish and Wildlife Service, FWSIOBS-81-04.

Levings, CD. 1982. Short term use of low-tide refugia in a sand flat by juvenile chinook, (Oncorhynchus Ishawylscha), Fraser River estuary. Canadian Technical Reports of Fisheries and Aquatic Sciences, Number 1111. 7 pages.

Levy, DA, and TG. Northcote. 1982. Juvenile salmon residency in Il marsh area of the Fraser River estuary. Canadian Journal of Fisheries and Aquatic Sciences 39:270-276.

Lindley, ST, ML Moser, DL Erickson, M Belchik, DW Welch, E Rechisky, JT Kelly, JC Hublein, and AP Klimley. 2008. Marine migration of North American green sturgeon.

Long Term Management Strategy. 2009. Programmatic Essential Fish Habitat (EFH) Assessment for the Long-Term Management Strategy for the Placement of Dredged Material in the San Francisco Bay Region. San Francisco, California.

Manson Construction Company. 2018. Fleet Specifications for derrick barges. Available at: http://www.mansonconstruction.com. Accessed: October 2018.

McEwan, D. 2001. Central Valley steelhead. Pages 1-44 in R.L. Brown, editor. Contributions to the Biology of Central Valley Salmonids. Volume 1. California Department of Fish and Game Bulletin 179.

Meehan, WR, and TC Bjorn. 1991. Salmonid distribution and life histories. Pages 47- 82 in Influences of Forest and Rangeland Management on Salmonid Fishes and Their Habitats. W.R. Meehan, editor. American Fisheries Society Special Publication 19. American Fisheries Society. Bethesda, Maryland.

Moyle PB, PI Foley, and RM Yoshiyama. 1992. Status of green sturgeon, Acipenser medirostris, in California. Final Report submitted to the National Marine Fisheries Service, University of California, Davis, 11 pp.

Moyle, PB. 2002. Inland fishes of California, 2nd edition. University of California Press, Berkeley and Los Angeles, CA. 502 pp.

Myers, JM, RG Kope, GJ Bryant, D Teel, LJ Lierheimer, TC Wainwright, WS Grant, FW Waknitz, K Neely, ST Lindley, and RS Waples. 1998. Status review of Chinook salmon from Washington, Idaho, Oregon, and California. U.S. Dept. OfCommer., NOAA Tech. Memo. NMFS-NWFSC-35. 443 pages.

Nakamoto, R.I., T.T. Kisanuki, and G. H. Gold5mith.1995. Age growth of Klamath River green sturgeon (*Acipenser medirostris*). U.S. Fish and Wildlife Service Project 93-FP-13, Yreka, CA, 20 pp.

[NMFS] National Marine Fisheries Service. 2001. Biological Opinion San Francisco-Oakland Bay Bridge East Span Seismic Safety Project. NMFS File No. 151422SWR99SR190. Dated: October 30, 2001.

NMFS. 2009. Supplemental Biological Opinion for the Completion of Pile Driving and Other Remaining Activities. San Francisco-Oakland Bay Bridge. NMFS File No. 151422SWR99SR190. Dated: August 21, 2009.

Port of Sacramento. 2018. City of West Sacramento, Port of Sacramento. Available at: https://www.cityofwestsacramento.org/business/economic-development-housing/port-of-west-sacramento . Accessed June 2018.

Port of Stockton. 2018. Port of Stockton Facts and Figures. Available at: https://www.portofstockton.com/port-facts-figures. Accessed June 2018.

Shirvell, e.s. 1990. Role of instrearn rootwads as juvenile coho salmon (Oncorhynchus kisutch) and steelhead trout (O. mykiss) cover habitat under varying stream flows. Canadian Journal of Fisheries and Aquatic Sciences 47:852-860.

Trenham, PC, HB Shaffer and PB Moyle. 1998. Biochemical identification and assessment of population subdivision in morphometrically similar native and invading smelt species (Hypomesus) in the Sacramento-San Joaquin Estuary, California. T. Am. Fish. Soc. 127: 417-424

[USFWS] United States Fish and Wildlife Service. 1995. Sacramento-San Joaquin Delta Native Fishes Recovery Plan. U.S. Fish and Wildlife Service, Portland, Oregon.

USFWS. 2004. Formal Programmatic Consultation on the Issuance of Section 10 and 404 Permits for Projects with Relatively Small Effects on the Delta smelt (Hypomesus transpacificus) and its critical habitat within the jurisdiction of the Sacramento Field Office of the U.S. fish and Wildlife Service, California. December.

USFWS. 2008. Formal Endangered Species Act Consultation on the Proposed Coordinated Operation of the Central Valley Project and State Water Project. BO: 81420-2008-F-1481-5. Sacramento, California.

USFWS. 2013. Endangered and Threatened Wildlife and Plants; 12-month Finding on a Petition to List the San Francisco Bay-Delta Population of the Longfin Smelt as Endangered or Threatened. Docket No. FWS-R8-ES-2008-0045. Bay Delta Fish & Wildlife Office. Available at: http://www.fws.gov/sfbaydelta/species/longfin_smelt.cfm. Accessed: August 2018.

Werme, C, J Hunt, E Beller, K Cayce, M Klatt, A Melwani, E Polson, and R Grossinger. 2010. Removal of Creosote-Treated Pilings and Structures from San Francisco Bay. Prepared for California State Coastal Conservancy. Contribution No. 605. San Francisco Estuary Institute, Oakland, California.

Appendix A

Table of Federally-Listed Species for the Area

Appendix A. Potential for special-status plant and wildlife species to occur in the Action Area. List compiled from the California Natural Diversity Database (CDFW 2018), U.S. Fish and Wildlife Service Species Lists (2018), and California Native Plant Society Rare and Endangered Plant Inventory (CNPS 2018) database searches for the Antioch North, Antioch South, Jersey Island and Brentwood USGS 7.5-minute quadrangles.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**
Wildlife			
Mammals			
California sea lion *Zalophus californianus*	MMPA	Range from central Mexico to British Columbia, Canada. Feeds on various fish and squid. Primary breeding range is from the Channel Islands in California to Southern Mexico.	**Present.** This species is known to seasonally travel up and down the portion of San Joaquin River where the Action Area is located.
harbor Seal *Phoca vitulina*	MMPA	Broadly distributed in coastal areas of the northern hemisphere. Most significant haul-out site in south San Francisco Bay is at Mowry Slough. Pups are born in March and April in Northern California.	**Present.** This species is known to seasonally travel up and down the portion of San Joaquin River where the Action Area is located.
salt-marsh harvest mouse *Reithrodontomys raviventris*	FE	Found only in the saline emergent wetlands of San Francisco Bay and its tributaries. Pickleweed is primary habitat. Do not burrow, build loosely organized nests. Require higher areas for flood escape.	**Not Present.** No pickleweed marsh or suitable undeveloped grasslands are present to support this species.
San Joaquin kit fox *Vulpes macrotis mutica*	FE	Annual grasslands or grassy open stages with scattered shrubby vegetation. Need loose-textured sandy soils for burrowing, and suitable prey base.	**Not Present.** No grassland or other suitable open habitat is present to support this species.
Birds			
American peregrine falcon *Falco peregrinus anatum*	FD	Largely resident. Requires protected cliffs, ledges or tall manmade structures for nesting. Often associated with coasts, bays, marshes and other open expanses of water. Preys primarily upon waterbirds; forages widely.	**Unlikely.** Suitable nesting structures including high transmission towers are present in the local area. However, none of those structures are within 500 feet of the Action Area. Eucalyptus trees near the eastern edge of the Action Area are not typically used by this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**
bald eagle *Haliaeetus leucocephalus*	FD	Occurs year-round in California, but primarily a winter visitor. Nests in large trees in the vicinity of larger lakes, reservoirs and rivers. Wintering habitat somewhat more variable but usually features large concentrations of waterfowl or fish.	**Not Present.** No suitable large trees are present within the Action Area or surrounds to support nesting by this species.
California brown pelican *Pelecanus occidentalis californicus*	FD	(Nesting colony) colonial nester on coastal islands just outside the surf line. Nests on coastal islands of small to moderate size which afford immunity from attack by ground-dwelling predators.	**Not Present.** This species nests on remote and unpopulated small islands. No islands or other such offshore habitat occur within the Action Area.
California least tern *Sterna antillarum browni*	FE	Nests along the coast from San Francisco bay south to northern Baja California. Colonial breeder on bare or sparsely vegetated, flat substrates: sand beaches, alkali flats, landfills, or paved areas.	**Not Present.** No suitable sand or gravel bars are present to support nesting by this species. This species is know to nest in the vicinity and as a result may be seen foraging in waters adjacent to the Action Area.
Ridgeway's clapper rail *Rallus longirostris obsoletus*	FE	Associated with tidal salt marsh and brackish marshes supporting emergent vegetation, upland refugia, and incised tidal channels.	**Not Present.** No suitable saltmarsh or tidal marsh habitat is present to support nesting by the species.
western snowy plover *Charadrius nivosus (alexandrines) nivosus*	FT, RP	Federal listing applies only to the Pacific coastal population. Year-round resident and winter visitor. Occurs on sandy beaches, salt pond levees, and the shores of large alkali lakes. Nests on the ground, requiring sandy, gravelly or friable soils.	**Not Present.** No suitable beach or shoreline habitat is present to support nesting by this species.
Reptiles and Amphibians			
Alameda whipsnake *Masticophis lateralis euryxanthus*	FT	Inhabits chaparral and foothill-hardwood habitats in the eastern Bay Area. Prefers south-facing slopes and ravines with rock outcroppings where shrubs form a vegetative mosaic with oak trees and grasses and small mammal burrows provide basking and refuge.	**Not Present.** The Action Area is comprised of developed uplands, or open waters. No chaparral or foothill woodland is present to support this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**
California red-legged frog *Rana aurora draytonii*	FT	Associated with quiet perennial to intermittent ponds, stream pools, and wetlands. Prefers shorelines with extensive vegetation. Documented to disperse through upland habitats after rains.	**Not Present.** No suitable freshwater marsh, ponds, or other such features are present within the local area to support breeding by this species.
California tiger salamander *Ambystoma californiense*	FT	Populations in Santa Barbara and Sonoma counties currently listed as endangered; threatened in remainder of range. Inhabits grassland, oak woodland, ruderal and seasonal pool habitats. Adults are fossorial and utilize mammal burrows and other subterranean refugia. Breeding occurs primarily in vernal pools and other seasonal water features.	**Not Present.** No suitable vernal pools, stock ponds, or other such features are present within the local area to support breeding by this species. Undeveloped uplands with burrows or other suitable aestivation habitat, which is also connected to breeding habitat, is not present.
giant garter snake *Thamnophis gigas*	FT	Prefers freshwater marsh and low gradient streams. Has adapted to drainage canals and irrigation ditches. This is the most aquatic of the garter snakes in California.	**Unlikely.** No freshwater marsh, low gradient streams, vegetated canals or irrigation ditches are present to provide both aquatic habitat and thick vegetative cover.
Fish			
Chinook Salmon - California coastal ESU *Oncorhynchus tshawytscha*	FT NMFS	California Coastal Chinook Salmon ESU includes all naturally spawned populations of Chinook salmon from rivers and streams south of the Klamath River (exclusive) to the Russian River (inclusive). Adult numbers depend on pool depth and volume, amount of cover, and proximity to gravel. Water temps >27 degrees C lethal to adults.	**Not Present**. Action Area is outside of the known range for this species.
Chinook salmon - central valley spring-run ESU *Oncorhynchus tshawytscha*	FT	Occurs in the Feather River and the Sacramento River and its tributaries, including Butte, Mill, Deer, Antelope and Beegum Creeks. Adults enter the Sacramento River from late March through September. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams from mid-August through early October. Juveniles migrate	**Present.** This species is known to occur in the waters adjacent to the Project Area, and the Action Area is located within designated critical habitat for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**
		soon after emergence as young-of-the-year, or remain in freshwater and migrate as yearlings.	
Chinook salmon – Sacramento winter-run ESU *Oncorhynchus tshawytscha*	FE NMFS	Occurs in the Sacramento River below Keswick Dam. Spawns in the Sacramento River but not in tributary streams. Requires clean, cold water over gravel beds with water temperatures between 6 and 14 degrees C for spawning. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams. Juveniles typically migrate to the ocean soon after emergence from the gravel.	**Present.** This species is known to occur in the waters adjacent to the Project Area.
coho salmon- central California coast ESU *Oncorhynchus kisutch*	FE NMFS	Federal listing includes populations between Punta Gorda and San Lorenzo River. State listing includes populations south of San Francisco Bay only. Occurs inland and in coastal marine waters. Requires beds of loose, silt-free, coarse gravel for spawning. Also needs cover, cool water, and sufficient dissolved oxygen.	**Not Present.** This species is considered extirpated from San Francisco Bay and San Joaquin River basin.
Delta smelt *Hypomesus transpacificus*	FT	Endemic to the Sacramento-San Joaquin delta area; found in areas where salt and freshwater systems meet. It occurs seasonally in Suisun Bay, Carquinez Strait and San Pablo Bay.	**Present.** This species is known to occur in waters surrounding the Action Area (CDFW 2018b). Waters of the Action Area are also designated as critical habitat for this species.
green sturgeon *Acipenser medirostris*	FT NMFS	Anadromous. Spawns in the Sacramento and Klamath River systems. Lingering transients may be found throughout the San Francisco Bay Estuary, particularly juveniles.	**Present.** This species is known to occur in waters surrounding the Action Area. Waters of the Action Area are within the species designated critical habitat.
longfin smelt *Spirinchus thaleichthys*	FC	Found in open waters of estuaries, mostly in the middle or bottom of the water column. This species prefers salinities of 15 to 30 ppt, but can be found in completely freshwater to almost pure seawater.	**Present.** This species is known to occur in waters surrounding the Action Area (CDFW 2018b).
steelhead - central CA coast DPS	FT	Occurs from the Russian River south to Soquel Creek and Pajaro River. Also in San Francisco and San Pablo Bay Basins. Adults migrate	**Unlikely.** This species range is generally only considered to extend through San Pablo Bay (2006, 71 FR 834 - 861). Upstream of San Pablo Bay and

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**
Oncorhynchus mykiss irideus		upstream to spawn in cool, clear, well-oxygenated streams. Juveniles remain in fresh water for 1 or more years before migrating downstream to the ocean.	into the San Joaquin River steelhead are classified as the Central Valley DPS. Therefore, the range of this species is outside of the Action Area.
steelhead - central valley DPS *Oncorhynchus mykiss irideus*	FT NMFS	Includes all naturally spawned populations (and their progeny) in the Sacramento and San Joaquin Rivers and their tributaries, excluding San Francisco and San Pablo bays and their tributaries. Preferred spawning habitat is in cool to cold perennial streams with high dissolved oxygen levels and fast flowing water. Abundant riffle areas for spawning and deeper pools with sufficient riparian cover for rearing are necessary for successful breeding.	**Present.** This species is known to occur in the waters of the Project Area, and the Action Area is located within designated critical habitat for this species.
tidewater goby *Eucyclogobius newberryi*	FE	Found in the brackish waters of coastal lagoons, marshes, creeks, and estuaries. Unique among fishes of the Pacific coast, gobies are restricted to waters of low salinity in coastal wetlands. They feed along the bottom, preferring clean, shallow, slow-moving waters	**Not Present.** This species is not known to occur near the Action Area, and is considered extirpated from San Francisco Bay.
Invertebrates			
Callippe silverspot butterfly *Speyeria callippe callippe*	FE	Two populations in San Bruno mountain and the Cordelia Hills are recognized. Hostplant is Viola pedunculata, which is found on serpentine soils. Most adults found on east-facing slopes; males congregate on hilltops in search of females.	**Not Present.** No potential host plants or suitable grassland habitats are present to support the species.
conservancy fairy shrimp *Branchinecta conservatio*	FE	Endemic to the grasslands of the northern two-thirds of the Central Valley; found in large, turbid pools. Inhabit astatic pools located in swales formed by old, braided alluvium; filled by winter/spring rains, last until June.	**Not Present.** No vernal pools are present within the Action Area to support this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**
Delta green ground beetle *Elaphrus viridis*	FT	Restricted to the margins of vernal pools in the grassland area between Jepson Prairie and Travis Air Force Base. Prefers the sandy mud substrate where it slopes gently into the water, with low-growing vegetation, 25 to100% cover.	**Not Present.** No vernal pools, grasslands or other suitable natural upland habitats are present within the Action Area to support this species.
Lange's metalmark butterfly *Apodemia mormo langei*	FE	Inhabits stabilized dunes along the San Joaquin River. Endemic to Antioch Dunes, Contra Costa County. Primary host plant is *Eriogonum nudum var. auriculatum*; feeds on nectar of other wildflowers, as well as host plant.	**Present.** This species is known to inhabit the Antioch Dunes Wildlife Refuge adjacent to the Action Area. However, the known habitats occupied by this species are approximately 500 feet outside of the Action Area. In addition, no host plants, suitable nectar plants or suitable natural upland habitats are present to support the species. No reasonably foreseen interrelated or interdependent activities associated with the wharf rehabilitation would result in potential indirect effects to the butterfly. The type of operations at the site would remain largely unchanged prior to and after wharf rehabilitation. Therefore the species is unlikely to occur within the Action Area, or to be affected by operations within the Action Area, but is present in the vicinity.
longhorn fairy shrimp *Branchinecta longiantenna*	FE	Endemic to the eastern margin of the central coast mountains in seasonally astatic grassland vernal pools. Inhabit small, clear-water depressions in sandstone and clear-to-turbid clay/grass-bottomed pools in shallow swales.	**Not Present.** The Action Area is outside of the known range for this species.
San Bruno elfin butterfly *Incisalia (=Callophrys) mossii bayensis*	FE	Limited to the vicinity of San Bruno Mountain, San Mateo County. Colonies are located on in rocky outcrops and cliffs in coastal scrub habitat on steep, north-facing slopes within the fog belt. Species range is tied to the distribution of the larval host plant, Sedum spathulifolium.	**Not Present.** The Action Area is outside of the limited known distribution for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**
valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	FT	Occurs only in the central valley of California, in association with blue elderberry (*Sambucus* spp.). Prefers to lay eggs in elderberrry 2 to 8 inches in diameter; some preference shown for "stressed" elderberry.	**Not Present.** The host plant for this species is not present within the Action Area.
vernal pool fairy shrimp *Branchinecta lynchi*	FT	Endemic to the grasslands of the Central Valley, central coast mountains, and south coast mountains, in astatic rain-filled pools. Inhabit small, clear-water sandstone-depression pools and grassed swale, earth slump, or basalt-flow depression pools.	**Not Present.** No vernal pools are present within the Action Area to support this species.
vernal pool tadpole shrimp *Lepidurus packardi*	FE	Inhabits vernal pools and swales in the Sacramento Valley containing clear to highly turbid water. Pools commonly found in grass bottomed swales of unplowed grasslands. Some pools are mud-bottomed and highly turbid.	**Not Present.** No vernal pools are present within the Action Area to support this species.
Plants			
Antioch Dunes evening-primrose *Oenothera deltoides ssp. howellii*	FE	Inland dunes. Elevation ranges from 0 to 100 feet (0 to 30 meters). Blooms Mar-Sep.	**Not Present.** The Action Area is highly developed with little exposed ground or shoreline. No suitable habitat is present for this species.
Colusa grass *Neostapfia colusana*	FT	Vernal pools (adobe, large). Elevation ranges from 15 to 655 feet (5 to 200 meters). Blooms May-Aug.	**Not Present**. The Action Area is highly developed with little exposed ground or shoreline. No suitable habitat is present for this species.
Contra Costa goldfields *Lasthenia conjugens*	FE	Cismontane woodland, playas (alkaline), valley and foothill grassland, vernal pools. Elevation ranges from 0 to 1540 feet (0 to 470 meters). Blooms Mar-Jun.	**Not Present**. The Action Area is highly developed with little exposed ground or shoreline. No suitable habitat is present for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE**
Contra Costa wallflower *Erysimum capitatum var. angustatum*	FE	Inland dunes. Elevation ranges from 5 to 65 feet (3 to 20 meters). Blooms Mar-Jul.	**Not Present**. The Action Area is highly developed with little exposed ground or shoreline. No suitable habitat is present for this species.
Keck's checker-mallow *Sidalcea keckii*	FE	Endemic to California and grows in relatively open areas on grassy slopes of the Sierra foothills.	**Not Present.** The Action Area is highly developed with little exposed ground or shoreline. No suitable habitat is present for this species.
large-flowered fiddleneck *Amsinckia grandiflora*	FE	Cismontane woodland, valley and foothill grassland. Elevation ranges from 885 to 1805 feet (270 to 550 meters). Blooms (Mar)Apr-May.	**Not Present**. The Action Area is highly developed with little exposed ground or shoreline. No suitable habitat is present for this species.
soft bird's-beak *Chloropyron molle ssp. molle*	FE	Marshes and swamps (coastal salt). Elevation ranges from 0 to 10 feet (0 to 3 meters). Blooms Jun-Nov.	**Not Present**. The Action Area is highly developed with little exposed ground or shoreline. No suitable habitat is present for this species.

*** Key to status codes:**

FE	Federal Endangered
FT	Federal Threatened
FD	Federal Delisted
NMFS	National Marine Fisheries Service - Species of Concern

****Potential species occurrence definitions:**

Present: Species is observed on the site or has been recorded (i.e., CNDDB, other reports) on the site recently.

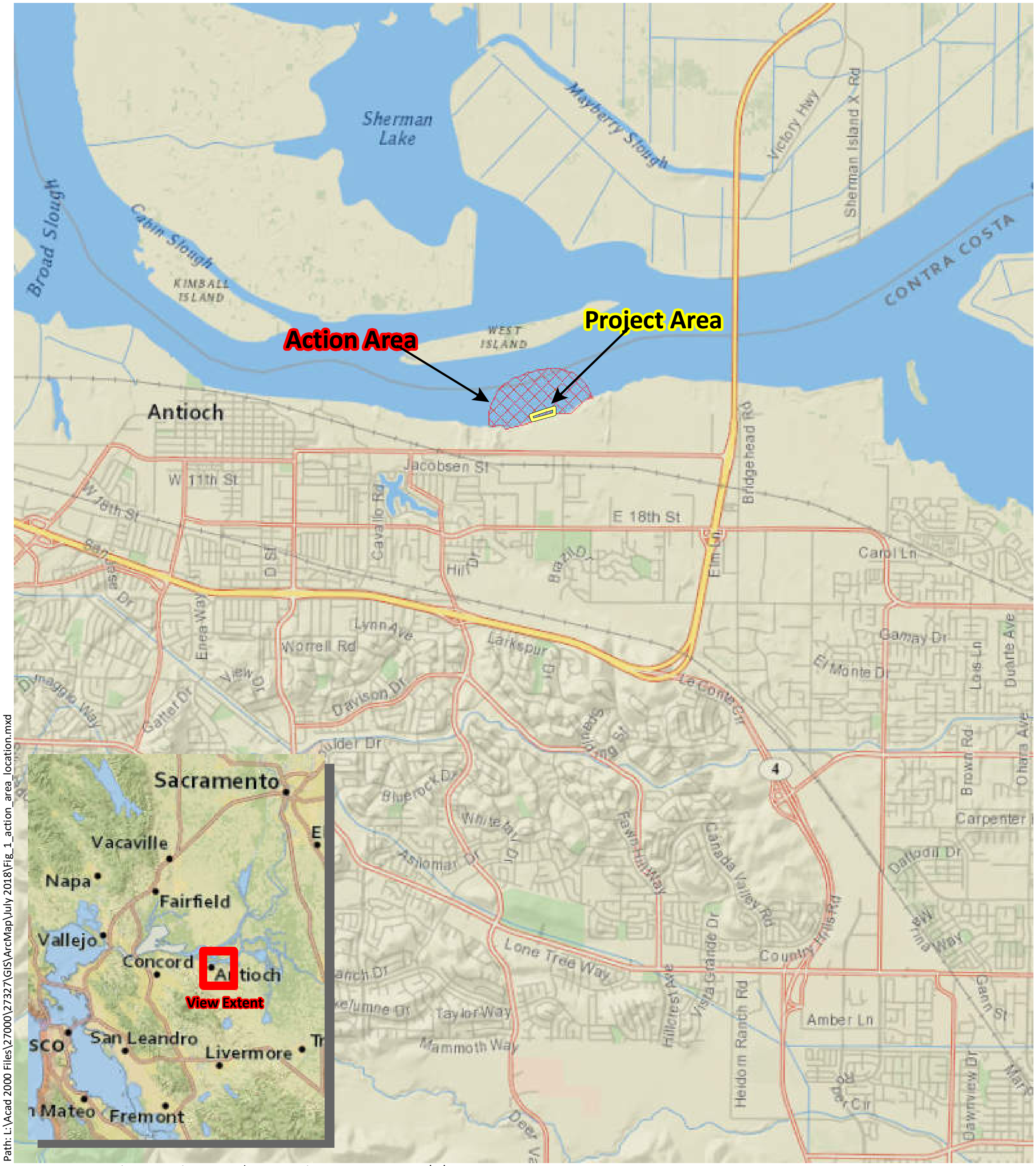
Not Present. Habitat on and adjacent to the site is clearly unsuitable for the species requirements (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).

Unlikely. Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species has a low probability of being found on the site.

Appendix B

Figures

Path: L:\Acad 2000 Files\27000\27327\GIS\ArcMap\July 2018\Fig_1_action_area_location.mxd



Sources: National Geographic, WRA | Prepared By: smortensen, 8/3/2018

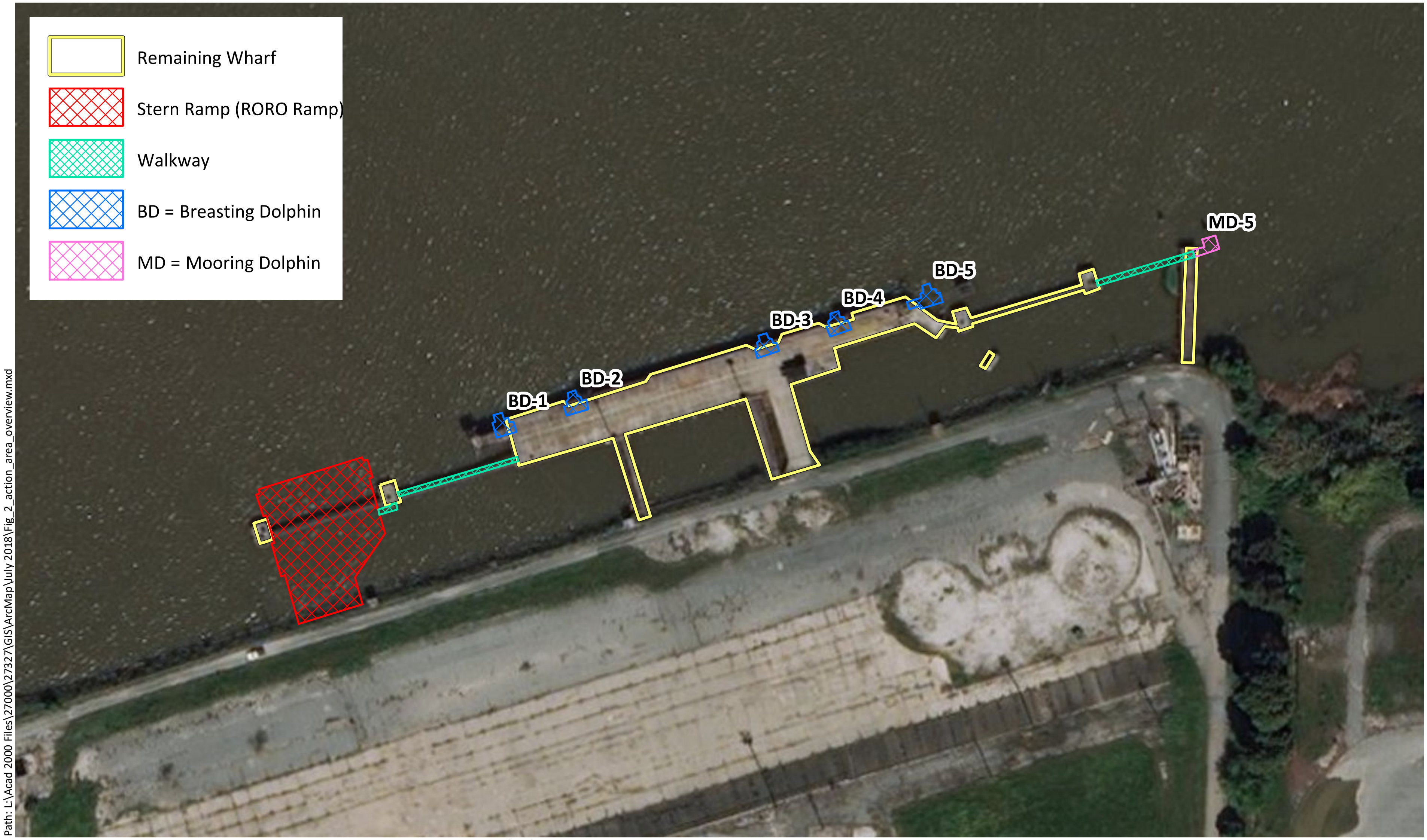
Figure 1. Action Area Location

AMPORTS Berth Rehabilitation
Contra Costa County, California

0 1 2 Miles

N

wra
ENVIRONMENTAL CONSULTANTS



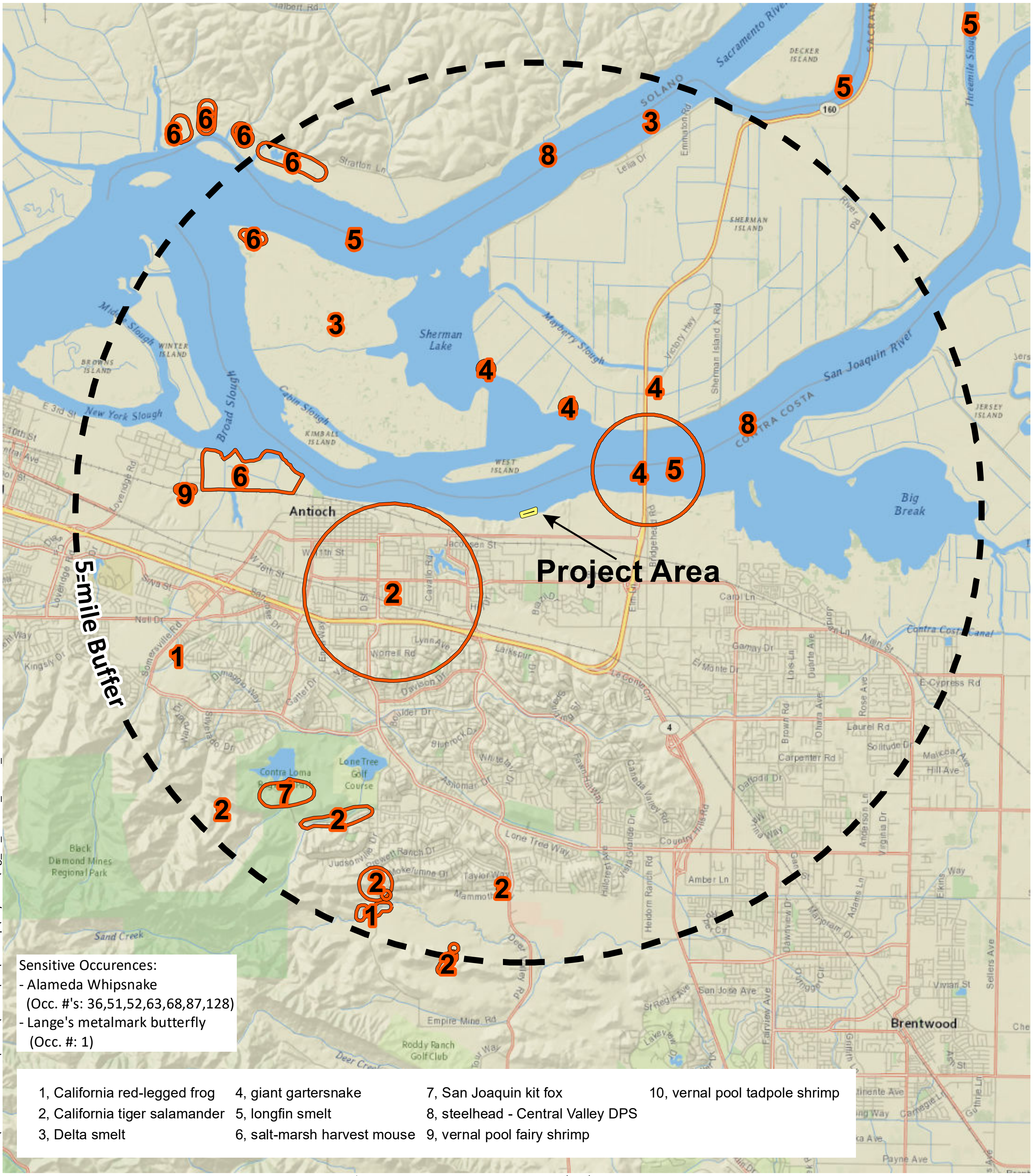
Path: L:\Acad 2000 Files\27000\27327\GIS\ArcMap\July 2018\Fig_2_action_area_overview.mxd

Sources: Esri Streaming - NAIP 2016, WRA | Prepared By: mweidenbach, 11/30/2018

Figure 2. Project Overview

Fassier Avenue Residential Project
Supplemental Environmental Impact Report
Pacifica, California

wra ENVIRONMENTAL CONSULTANTS



Path: L:\Acad 2000 Files\27000\27327\GIS\ArcMap\July 2018\Fig_3a_CNDDB_results_wildlife.mxd

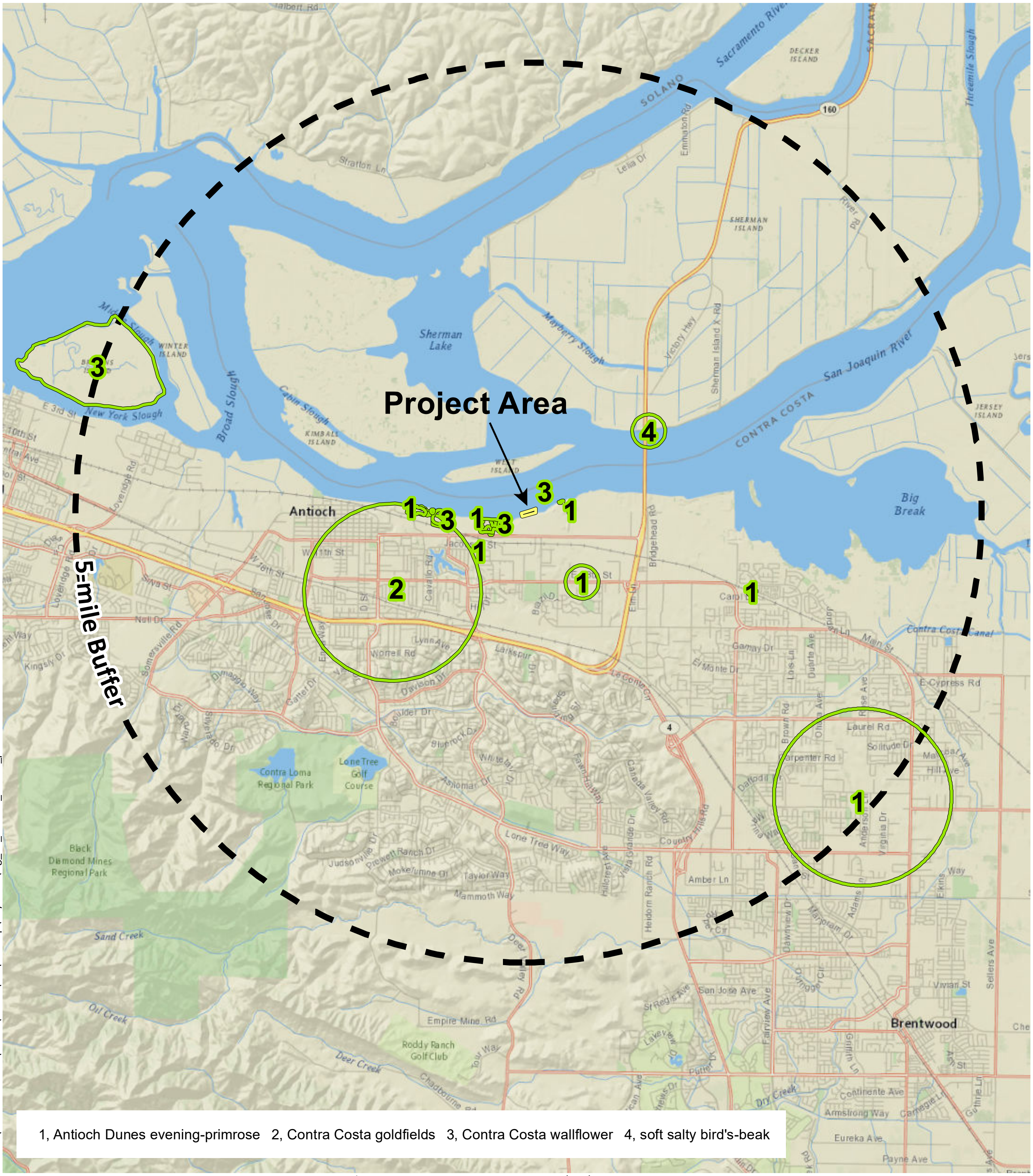
Sources: National Geographic, CNDDB July 2018, WRA | Prepared By: mweidenbach, 11/30/2018

Figure 3a. California Natural Diversity Database Results Wildlife

AMPORTS Wharf Replacement
Contra Costa County, California

0 1 2 Miles
N

WRA ENVIRONMENTAL CONSULTANTS



Path: L:\Acad 2000 Files\27000\27327\GIS\ArcMap\July 2018\Fig_3b_CNDDB_results_plants.mxd

Sources: National Geographic, CNDDB July 2018, WRA | Prepared By: mweidenbach, 11/30/2018

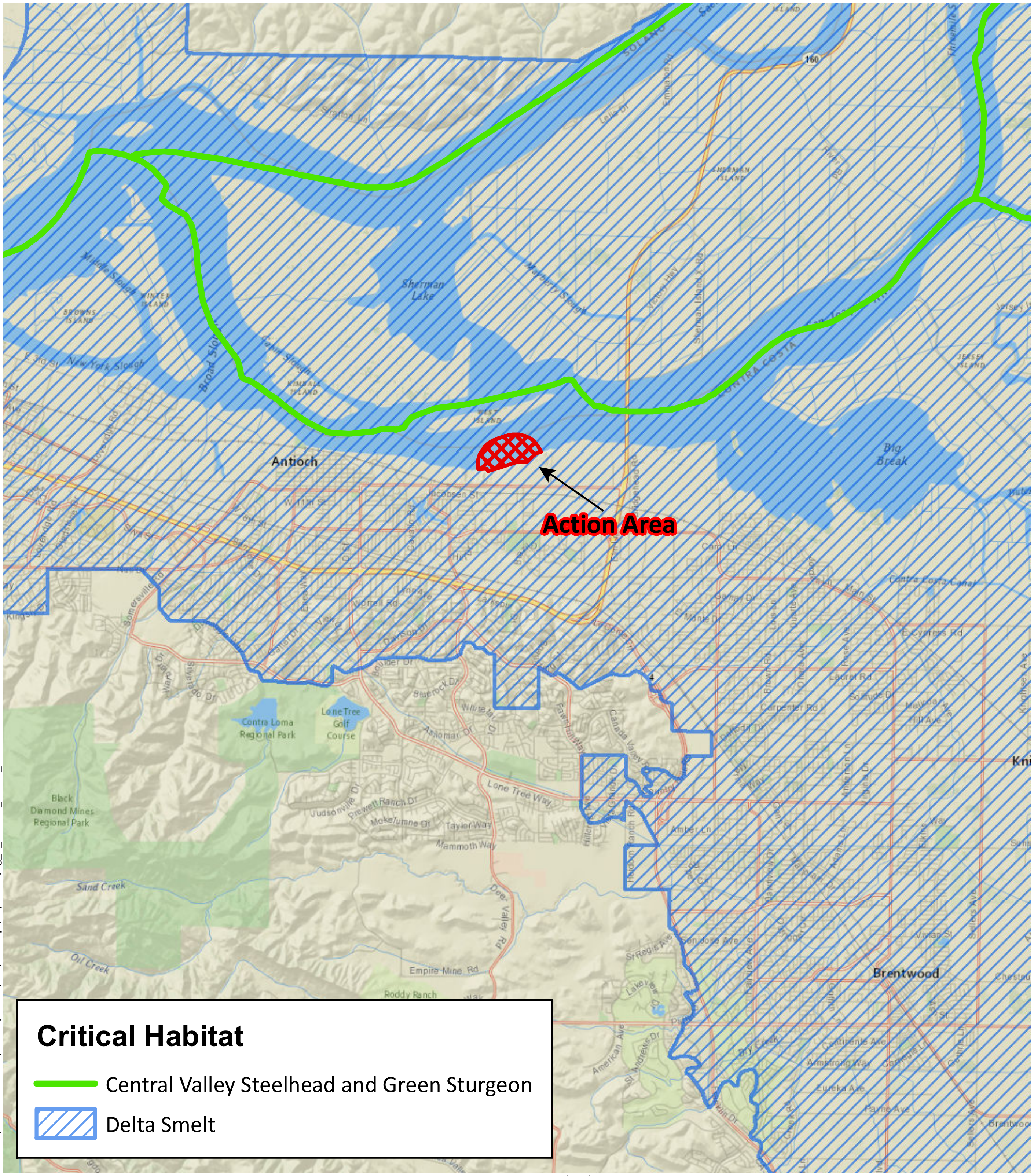
Figure 3b. California Natural Diversity Database Results Plants

AMPORTS Wharf Replacement
Contra Costa County, California

0 1 2 Miles

N

wra ENVIRONMENTAL CONSULTANTS



Path: L:\Acad 2000 Files\27000\27327\GIS\ArcMap\July 2018\Fig_5_CNDDB_critical_habitat.mxd

Sources: National Geographic, CNDDB July 2018, WRA | Prepared By: mweidenbach, 11/30/2018

Figure 4. Critical Habitat within the Action Area

AMPORTS Wharf Replacement
Contra Costa County, California

0 1 2 Miles

N

wra ENVIRONMENTAL CONSULTANTS

Path: L:\Acad 2000 Files\27000\27327\GIS\ArcMap\July 2018\Fig_5_hydroacoustic_action_area.mxd

Sources: National Geographic, CNDDB July 2018, WRA | Prepared By: mweidenbach, 12/2/2018

Figure 5. Hydroacoustic Action Area

AMPORTS Wharf Replacement
Contra Costa County, California

0 0.5 1 Miles

N

WRA ENVIRONMENTAL CONSULTANTS

Appendix C

Plans Plans

AMPORTS

2301 - 2603 WILBUR AVENUE
ANTIOCH, CA 94509

ANTIOCH WHARF - PULP TO RORO BERTH CONVERSION PROJECT

DRAWING LIST

DRAWING NUMBER	DATE	DESCRIPTION
S-00	2-05-18	TITLE SHEET, DRAWING LIST
S-01	2-05-18	VICINITY MAP
S-02	2-05-18	USGS TOPOGRAPHIC MAP
S-03	2-05-18	OVERALL SITE PLAN WITH MAJOR FEATURES (EXISTING)
S-04	2-05-18	WHARF DEMOLITION DRAWING
S-05	2-05-18	OVERALL SITE PLAN WITH NEW FEATURES
S-06	2-05-18	NEW PILE PLAN
S-07	2-05-18	STERN RAMP SECTION
S-08	2-05-18	BREASTING DOLPHIN S1,2,3 AND 4
S-09	2-05-18	BREASTING DOLPHIN 5
S-10	2-05-18	MOORING DOLPHIN
S-11	2-05-18	WALKWAY SECTION
S-12	2-05-18	WALKWAY SECTION
S-13	2-05-18	WALKWAY ELEVATION
S-14	2-05-18	STRUCTURAL REPAIRS PILE SLEEVE

FILE LOCATION: O:\A100000\A104430\CAD\TASK 300\A104430-PERMIT SET\A104430-AMPORTS-S-00-S-02 PERMIT.DWGDATE: 2/5/2018 1:09:31 PM DRAFTSPERSON: JULIUS BACINILLO

DRAWING BY: COWI
1300 Clay Street, 7th Floor
Oakland, CA 94612
Tel.: 510.839.8972
Fax: 510.839.9715
Website: www.cowi-na.com

CONTACT: JAMES KEARNEY, PE
(510)267-7170

DATUM: MLLW

TITLE SHEET AND DRAWING LIST

NOT TO SCALE

AMPORTS
2301-2603 WILBUR AVENUE
ANTIOCH, CA 94509

ANTIOCH WHARF - PULP TO RORO BERTH CONVERSION PROJECT

SHEET S-00 DATE: 2-05-18

DRAWING BY: COWI

1300 Clay Street, 7th Floor
Oakland, CA 94612
Tel.: 510.839.8972
Fax: 510.839.9715
Website: www.cowi-na.com

CONTACT: JAMES KEARNEY, PE
(510)267-7170

DATUM: MLLW

VICINITY MAP

SCALE: 1"=12000'

AMPORTS

2301-2603 WILBUR AVENUE
ANTIOCH, CA 94509

ANTIOCH WHARF - PULP TO RORO BERTH CONVERSION PROJECT

SHEET S-01

DATE: 2-05-18

DRAWING BY: COWI 1300 Clay Street, 7th Floor Oakland, CA 94612 Tel.: 510.839.8972 Fax: 510.839.9715 Website: www.cowi-na.com

CONTACT: JAMES KEARNEY, PE (510)267-7170

DATUM: MLLW

USGS TOPOGRAPHIC MAP

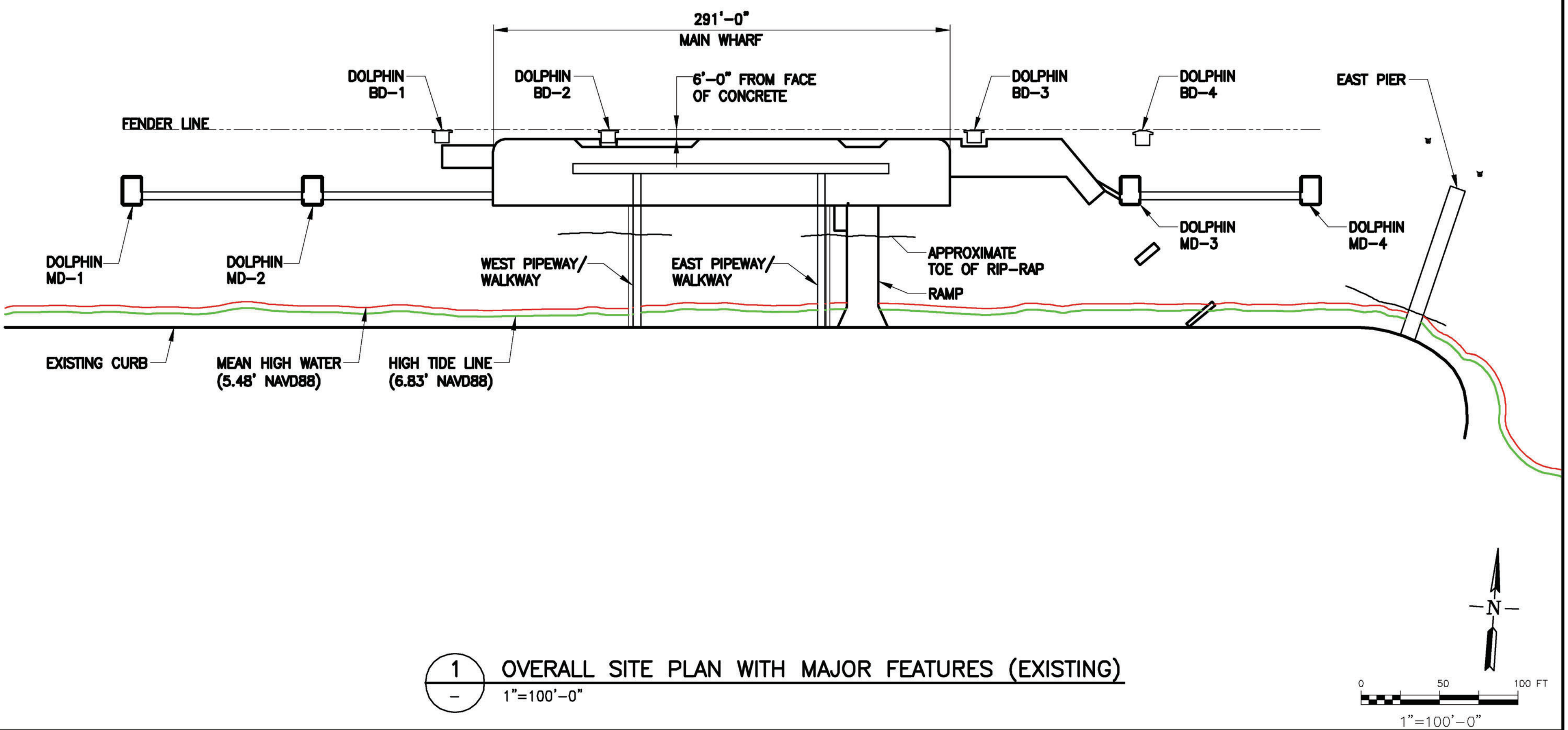
AS SHOWN

AMPORTS
2301-2603 WILBUR AVENUE
ANTIOCH, CA 94509

ANTIOCH WHARF - PULP TO RORO BERTH CONVERSION PROJECT

SHEET **S-02**

DATE: **2-05-18**



1 – OVERALL SITE PLAN WITH MAJOR FEATURES (EXISTING)
1"=100'-0"

DRAWING BY: COWI

1300 Clay Street, 7th Floor
Oakland, CA 94612
Tel.: 510.839.8972
Fax: 510.839.9715
Website: www.cowi-na.com

CONTACT: JAMES KEARNEY, PE
(510)267-7170

DATUM: MLLW

OVERALL SITE PLAN WITH MAJOR FEATURES (EXISTING)

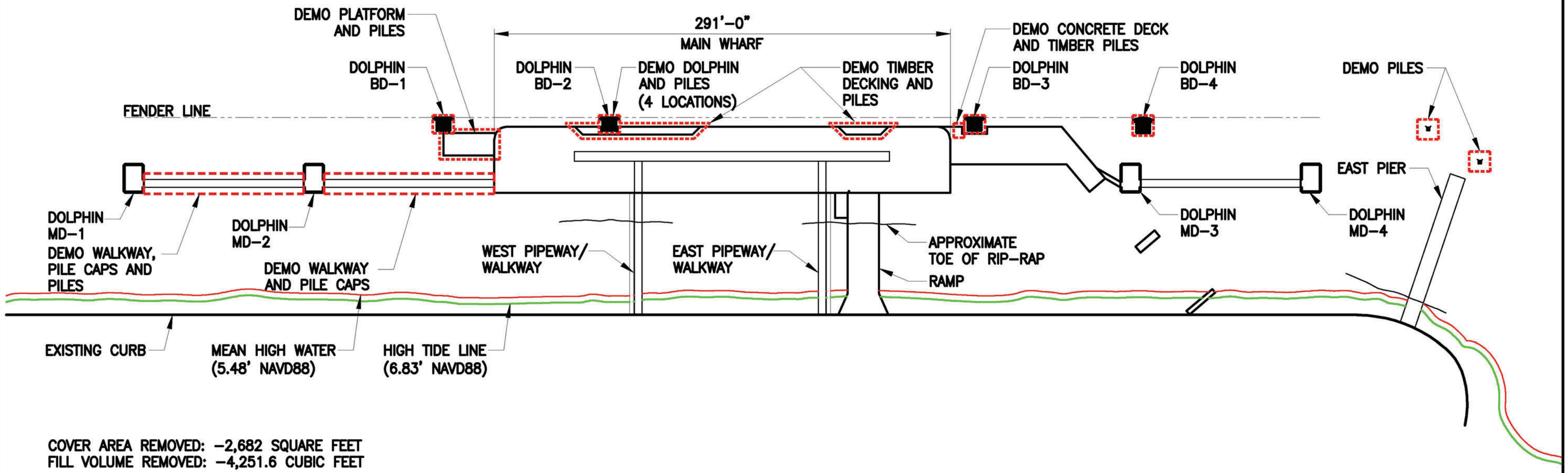
SCALE: 1"=100'

AMPORTS
2301-2603 WILBUR AVENUE
ANTIOCH, CA 94509

ANTIOCH WHARF - PULP TO RORO BERTH CONVERSION PROJECT

SHEET	S-03	DATE:	2-05-18

FILE LOCATION: O:\A100000\A104430\CAD\TASK 300\A104430-PERMIT SET\A104430-AMPORTS-S-03 PERMIT.DWGDATE: 2/6/2018 8:00:22 AM DRAFTSPERSON: JULIUS BACINILLO



COVER AREA REMOVED: –2,682 SQUARE FEET
FILL VOLUME REMOVED: –4,251.6 CUBIC FEET

SEE NEXT SHEET, S–05, FOR NEW COVER, FILL AND NET CHANGES.

1 – WHARF DEMOLITION PLAN
1"=100'–0"

0 50 100 FT
1"=100'–0"

DRAWING BY: COWI
1300 Clay Street, 7th Floor
Oakland, CA 94612
Tel.: 510.839.8972
Fax: 510.839.9715
Website: www.cowi-na.com

CONTACT: JAMES KEARNEY, PE
(510)267–7170

DATUM: MLLW

WHARF DEMOLITION DRAWING

SCALE: 1"=100'

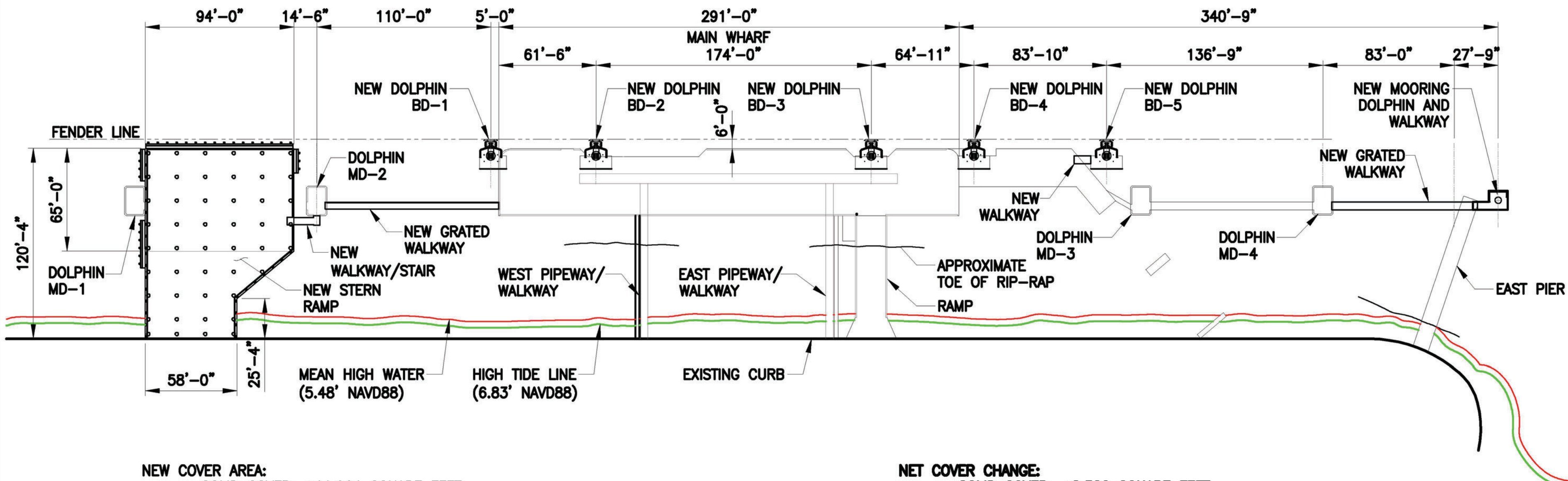
AMPORTS
2301-2603 WILBUR AVENUE
ANTIOCH, CA 94509

ANTIOCH WHARF - PULP TO RORO BERTH CONVERSION PROJECT

SHEET S–04

DATE: 2–05–18

FILE LOCATION: \\COWI.NET\PROJECTS\A100000\A104430\CAD\TASK 300\A104430-PERMIT SET\A104430-AMPORTS-S-03_PERMIT.DWGDATE: 2/6/2018 11:34:01 AM DRAFTSPERSON: JIM KEARNEY



NEW COVER AREA:
SOLID COVER: +11,064 SQUARE FEET
GRATING COVER: +557 SQUARE FEET

NEW FILL VOLUME: +10,090 CUBIC FEET

NET COVER CHANGE:
SOLID COVER: +8,382 SQUARE FEET
GRATING COVER: +557 SQUARE FEET

NET FILL CHANGE: +5,838 CUBIC FEET

N

0 50 100 FT
1"=100'-0"

1 – OVERALL SITE PLAN WITH NEW FEATURES
1"=100'-0"

DRAWING BY: COWI

1300 Clay Street, 7th Floor
Oakland, CA 94612
Tel.: 510.839.8972
Fax: 510.839.9715
Website: www.cowi-na.com

CONTACT: JAMES KEARNEY, PE
(510)267-7170

DATUM: MLLW

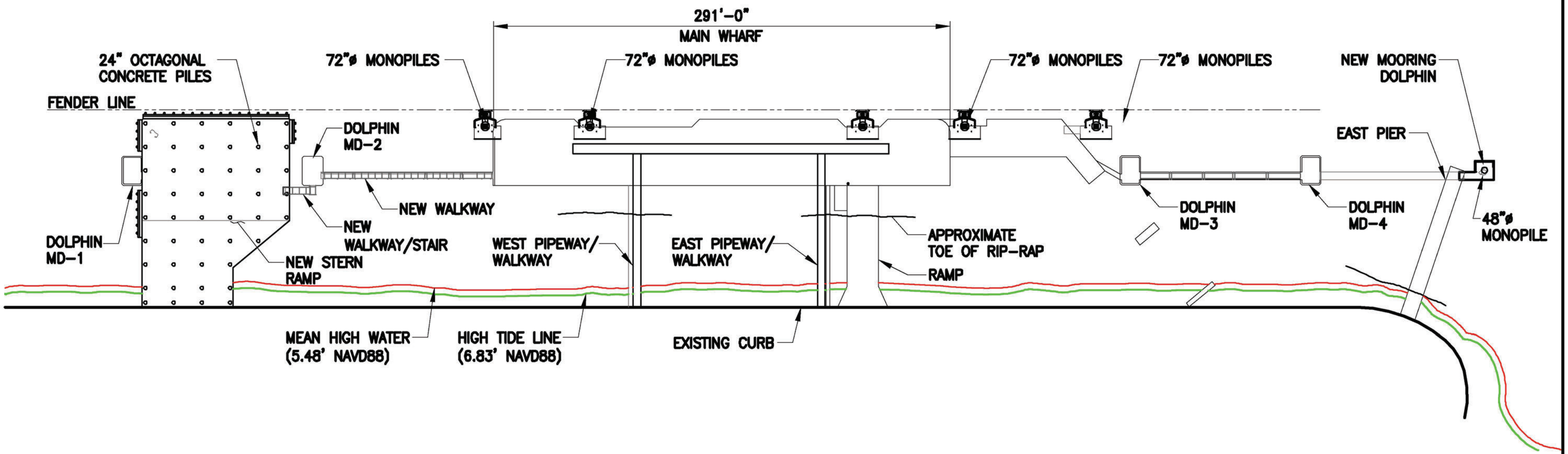
OVERALL SITE PLAN WITH NEW FEATURES

SCALE: 1"=100'

AMPORTS
2301-2603 WILBUR AVENUE
ANTIOCH, CA 94509

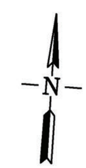
ANTIOCH WHARF - PULP TO RORO BERTH CONVERSION PROJECT

SHEET S-05 | DATE: 2-05-18

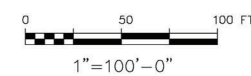


NOTE:

COAT STEEL PILES WITH 1 COAT WASSER
MC-ZINC AND 2 COATS WASSER MC-TAR.



1
–
NEW PILE PLAN
1"=100'-0"



DRAWING BY: COWI

1300 Clay Street, 7th Floor
Oakland, CA 94612
Tel.: 510.839.8972
Fax: 510.839.9715
Website: www.cowi-na.com

CONTACT: JAMES KEARNEY, PE
(510)267-7170

DATUM: MLLW

NEW PILE PLAN

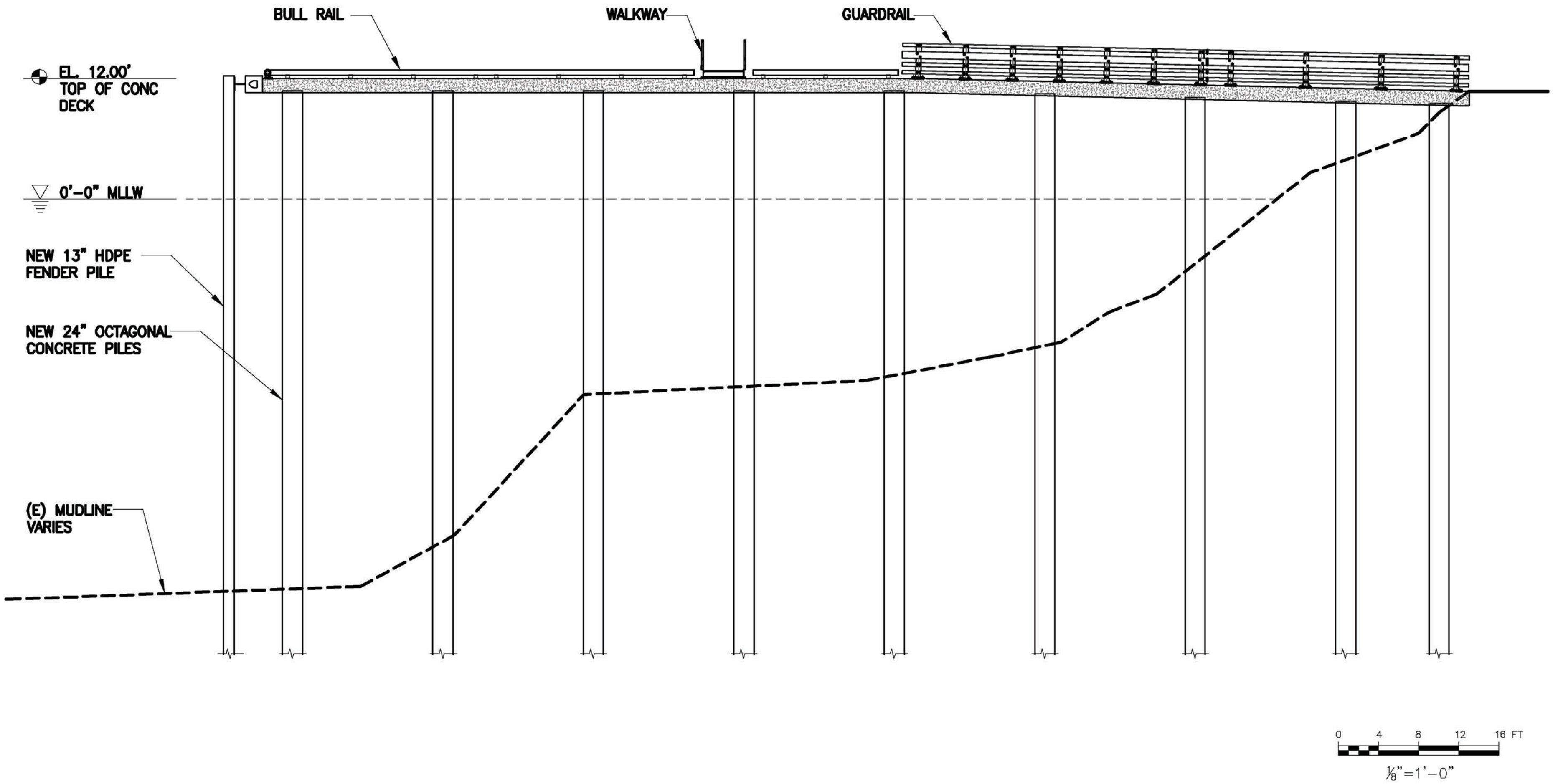
SCALE: 1"=100'

AMPORTS
2301-2603 WILBUR AVENUE
ANTIOCH, CA 94509

ANTIOCH WHARF - PULP TO RORO
BERTH CONVERSION PROJECT

SHEET **S–06** DATE: **2-05-18**

FILE LOCATION: O:\A100000\A104430\CAD\TASK 300\A104430-PERMIT SET\A104430-AMPORTS-S-03_PERMIT.DWGDATE: 2/6/2018 8:04:34 AM DRAFTSPERSON: JULIUS BACINILLO



FILE LOCATION: O:\A100000\A104430\CAD\TASK 300\A104430-PERMIT SET\A104430-AMPORTS-S-03_PERMIT.DWG DATE: 2/5/2018 8:08:12 AM DRAFTSPERSON: JULIUS BACINILLO

DRAWING BY: COWI

1300 Clay Street, 7th Floor
Oakland, CA 94612
Tel.: 510.839.8972
Fax: 510.839.9715
Website: www.cowi-na.com

CONTACT: JAMES KEARNEY, PE
(510)267-7170

DATUM: MLLW

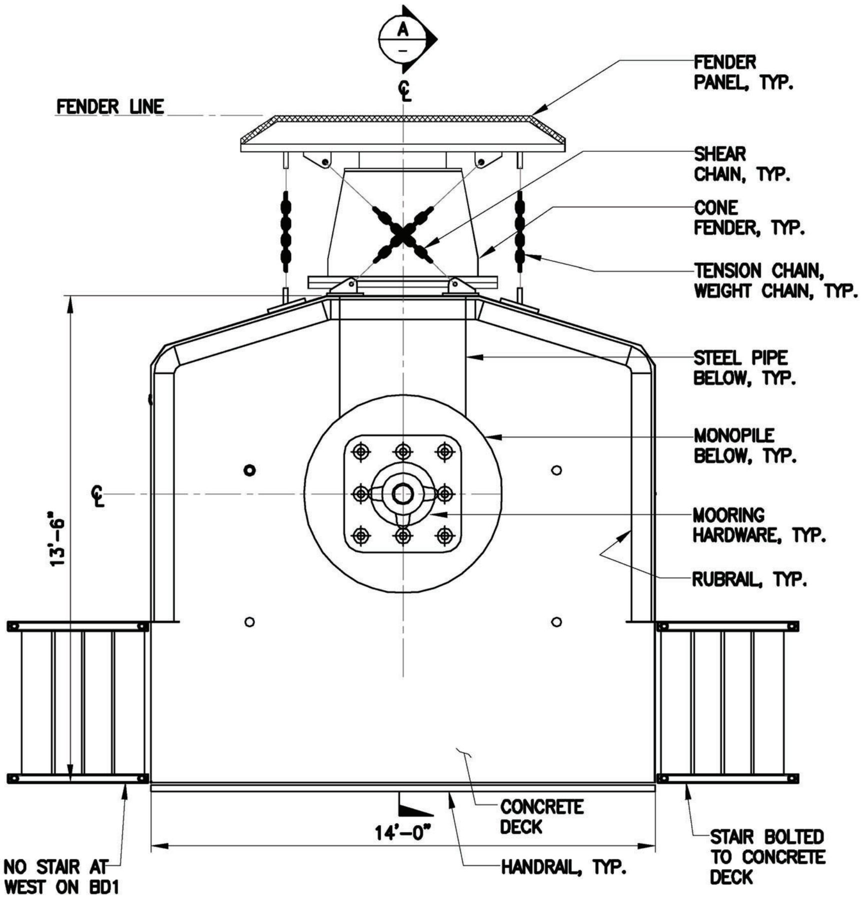
STERN RAMP SECTION

SCALE: 1/8"=1'-0"

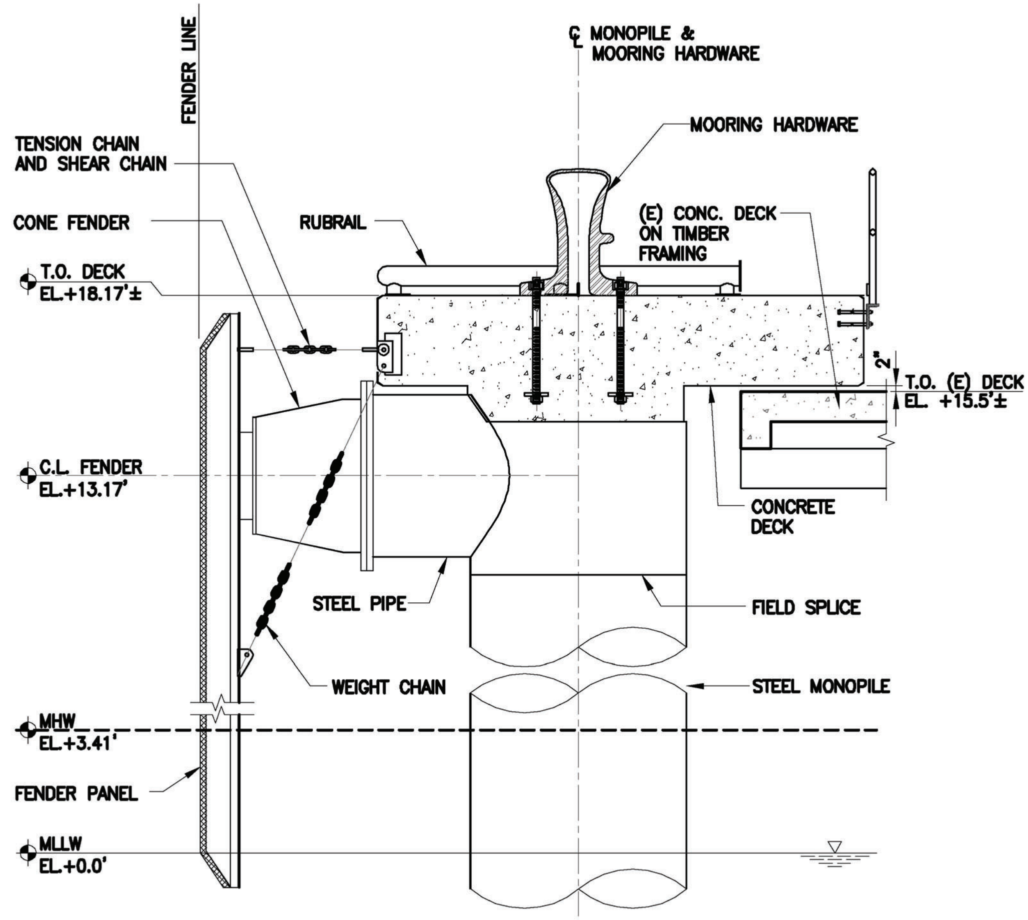
AMPORTS
2301-2603 WILBUR AVENUE
ANTIOCH, CA 94509

ANTIOCH WHARF - PULP TO RORO BERTH CONVERSION PROJECT

SHEET **S-07** DATE: **2-05-18**



1 BREASTING DOLPHIN PLAN
3/16"=1'-0"



A BREASTING DOLPHIN SECTION
3/16"=1'-0"

0 3 6 9 12 FT
3/16"=1'-0"

DRAWING BY: COWI
1300 Clay Street, 7th Floor
Oakland, CA 94612
Tel.: 510.839.8972
Fax: 510.839.9715
Website: www.cowi-na.com

CONTACT: JAMES KEARNEY, PE
(510)267-7170

DATUM: MLLW

BREASTING DOLPHIN S1, 2, 3, AND 4

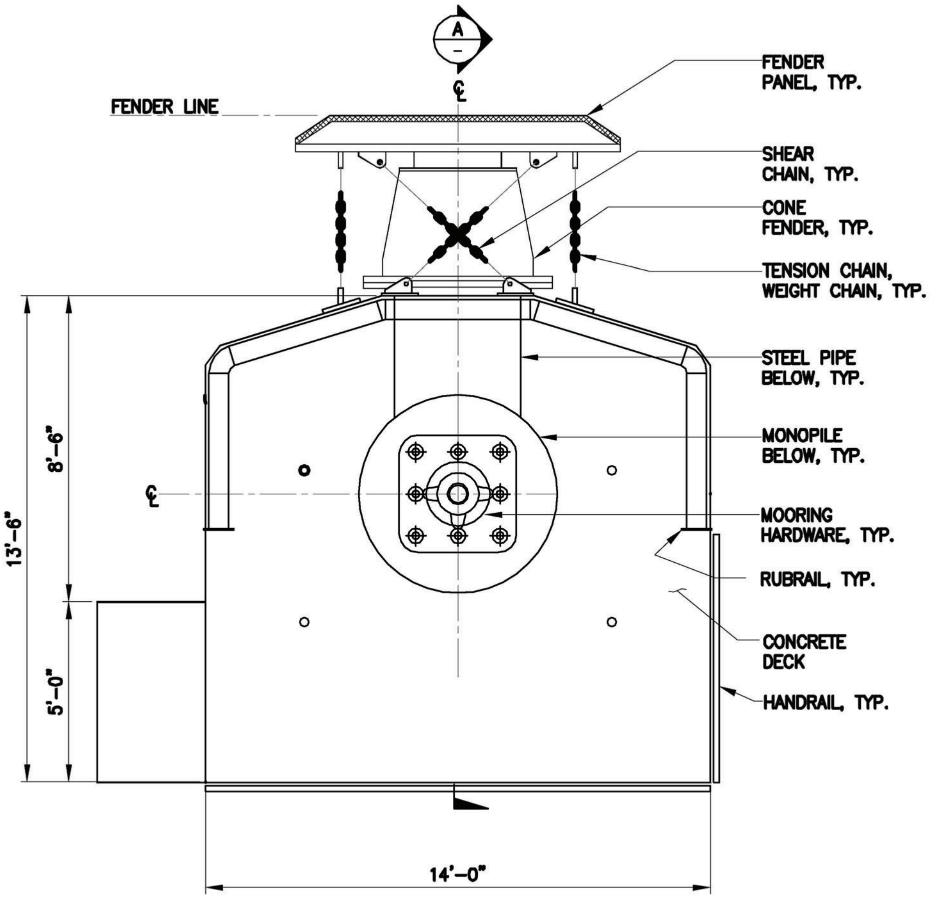
SCALE: 3/16"=1'-0"

AMPORTS
2301-2603 WILBUR AVENUE
ANTIOCH, CA 94509

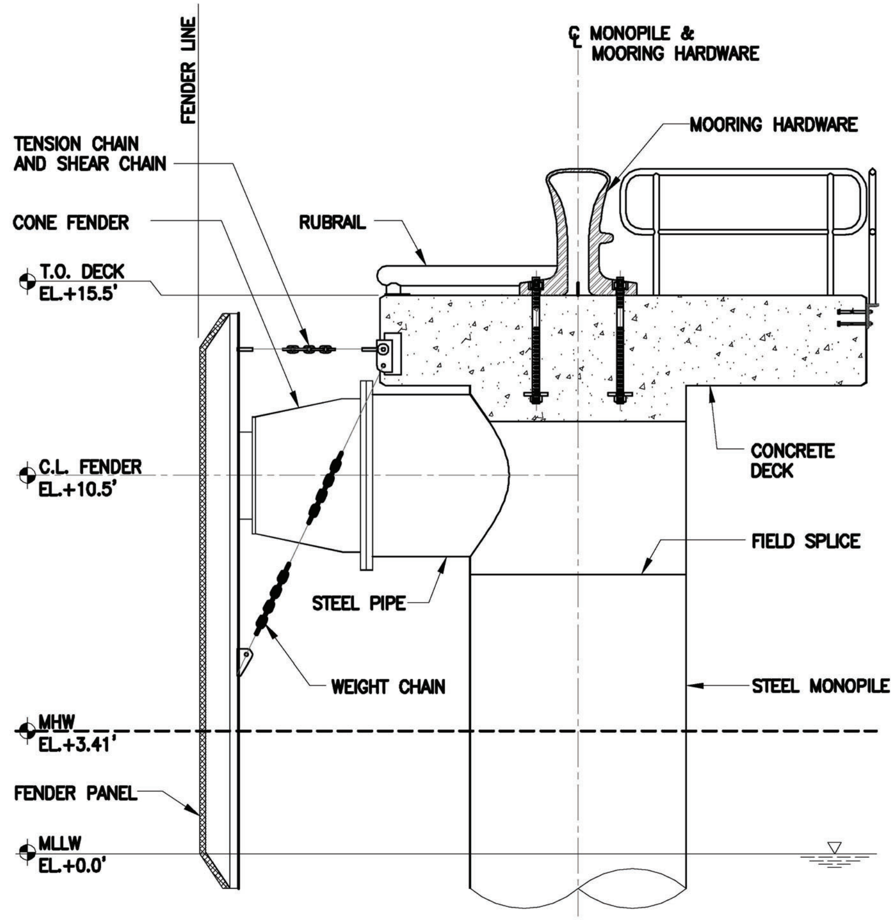
ANTIOCH WHARF - PULP TO RORO BERTH CONVERSION PROJECT

SHEET S-08 | DATE: 2-05-18

FILE LOCATION: O:\A100000\A104430\CAD\TASK 300\A104430-PERMIT SET\A104430-AMPORTS-S-03_PERMIT.DWG DATE: 2/6/2018 8:10:05 AM DRAFTSPERSON: JULIUS BACINILLO



1 BREASTING DOLPHIN PLAN
3/16"=1'-0"



A BREASTING DOLPHIN SECTION
3/16"=1'-0"

0 3 6 9 12 FT
3/16"=1'-0"

DRAWING BY: COWI

1300 Clay Street, 7th Floor
Oakland, CA 94612
Tel.: 510.839.8972
Fax: 510.839.9715
Website: www.cowi-na.com

CONTACT: JAMES KEARNEY, PE
(510)267-7170

DATUM: MLLW

BREASTING DOLPHIN 5

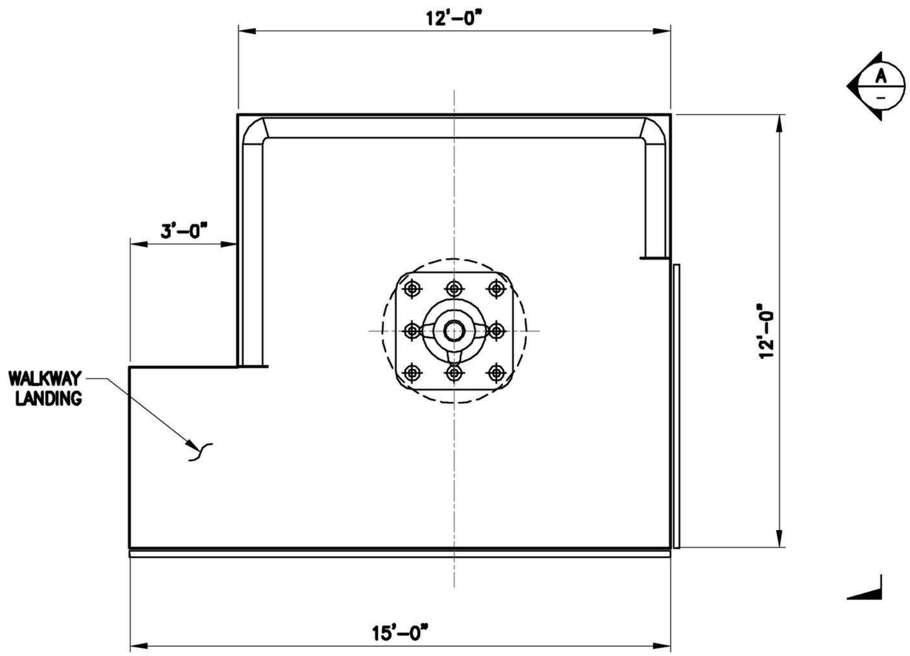
SCALE: 3/16"=1'-0"

AMPORTS
2301-2603 WILBUR AVENUE
ANTIOCH, CA 94509

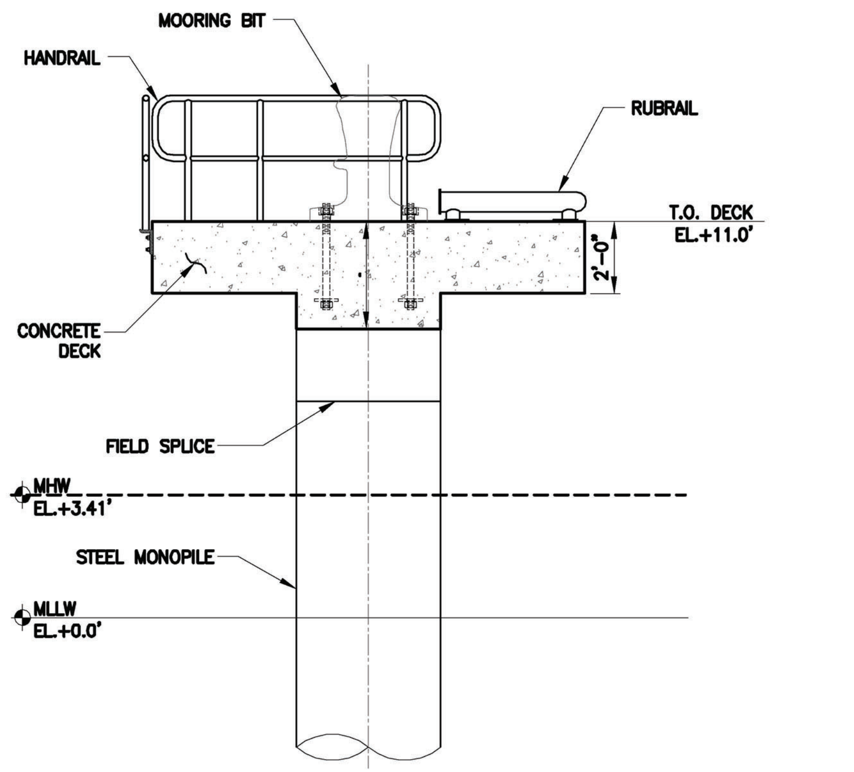
ANTIOCH WHARF - PULP TO RORO BERTH CONVERSION PROJECT

SHEET **S-09**

DATE: **2-05-18**



1 – MOORING DOLPHIN PLAN
3/16"=1'–0"



A – MOORING DOLPHIN ELEVATION
3/16"=1'–0"

0 3 6 9 12 FT
3/16"=1'–0"

FILE LOCATION: O:\A100000\A104430\CAD\TASK 300\A104430-PERMIT SET\A104430-AMPORTS-S-03_PERMIT.DWG DATE: 2/5/2018 2:29:43 PM DRAFTSPERSON: JULIUS BACINILLO

DRAWING BY: COWI
1300 Clay Street, 7th Floor
Oakland, CA 94612
Tel.: 510.839.8972
Fax: 510.839.9715
Website: www.cowi-na.com

CONTACT: JAMES KEARNEY, PE
(510)267-7170

DATUM: MLLW

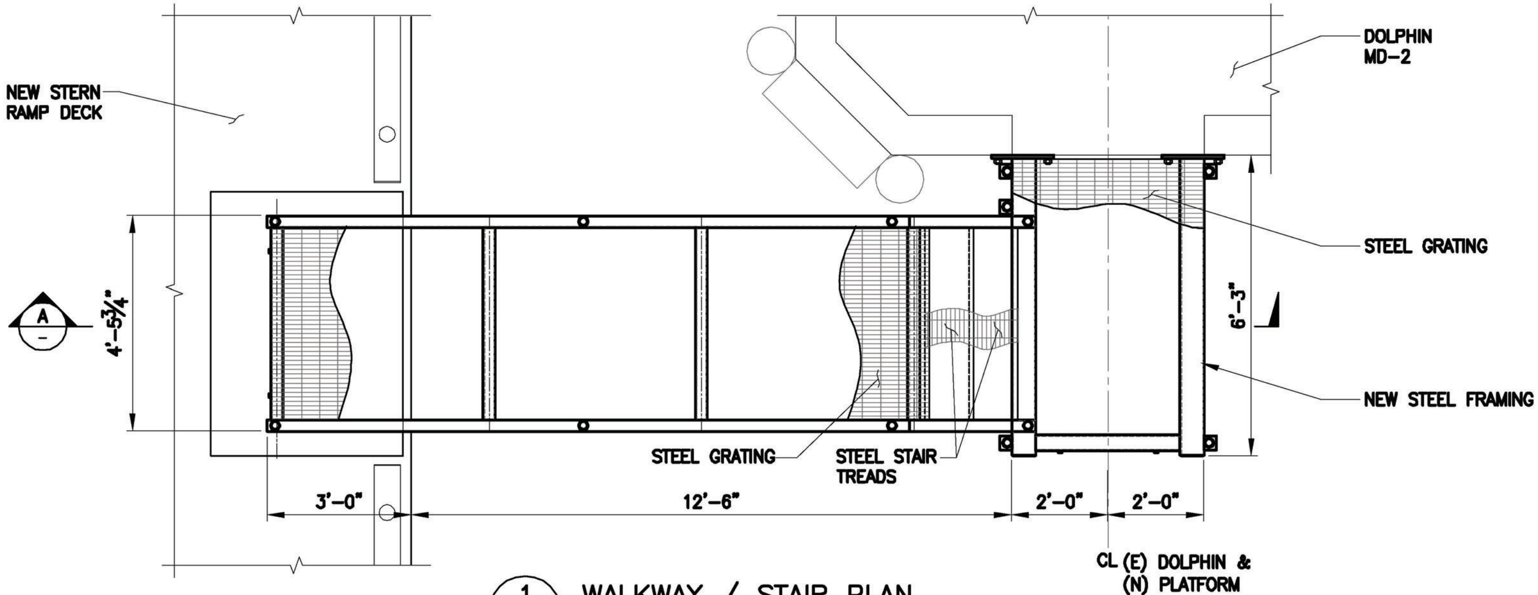
MOORING DOLPHIN

SCALE: 3/16"=1'–0"

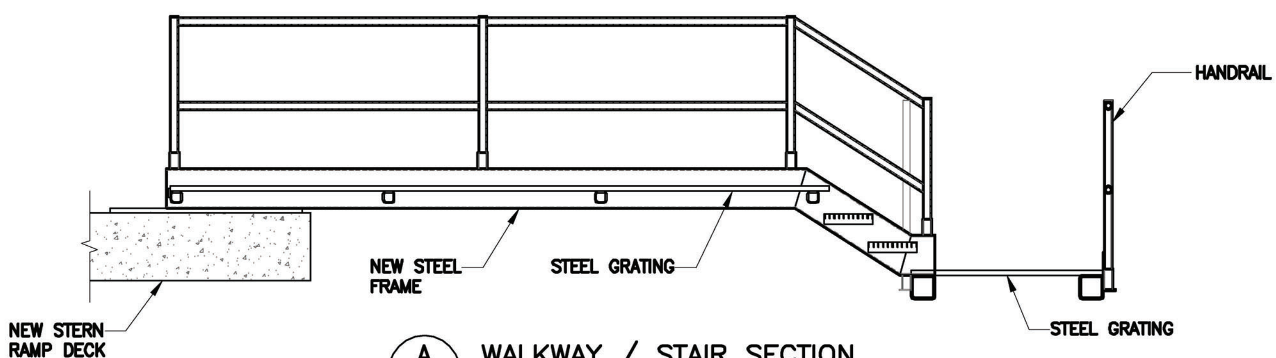
AMPORTS
2301-2603 WILBUR AVENUE
ANTIOCH, CA 94509

ANTIOCH WHARF - PULP TO RORO BERTH CONVERSION PROJECT

SHEET **S–10** DATE: **2–05–18**



1 – WALKWAY / STAIR PLAN
1/4"=1'-0"



A – WALKWAY / STAIR SECTION
1/4"=1'-0"

0 2 4 6 8 FT
¼"=1'-0"

DRAWING BY: COWI

1300 Clay Street, 7th Floor
Oakland, CA 94612
Tel.: 510.839.8972
Fax: 510.839.9715
Website: www.cowi-na.com

CONTACT: JAMES KEARNEY, PE
(510)267-7170

DATUM: MLLW

WALKWAY SECTION

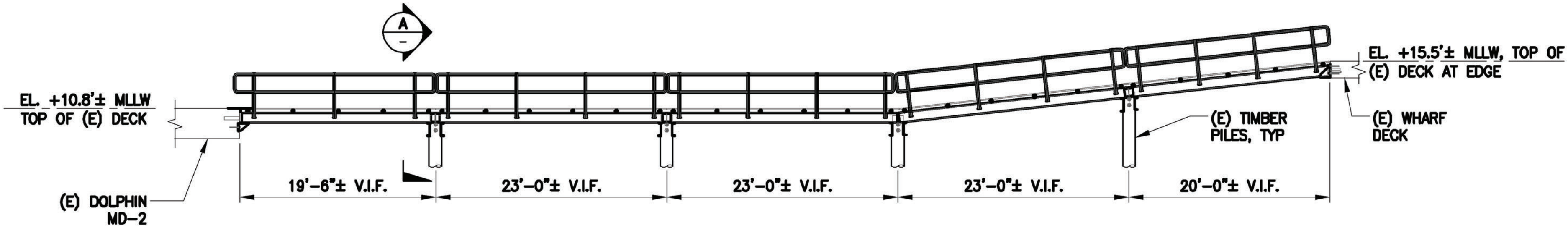
SCALE: AS SHOWN

AMPORTS
2301-2603 WILBUR AVENUE
ANTIOCH, CA 94509

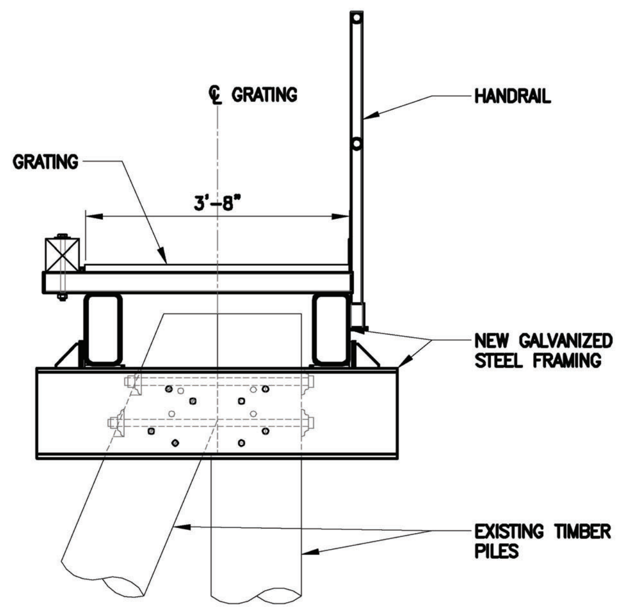
ANTIOCH WHARF - PULP TO RORO BERTH CONVERSION PROJECT

SHEET	S-11	DATE: 2-05-18

FILE LOCATION: O:\A100000\A104430\CAD\TASK 300\A104430-PERMIT SET\A104430-AMPORTS-S-03 PERMIT.DWG DATE: 2/5/2018 2:29:49 PM DRAFTSPERSON: JULIUS BACINILLO



1 – GRATED WALKWAY ELEVATION
1/16"=1'-0"



A – WALKWAY SECTION
1/16"=1'-0"

0 2 4 6 8 FT
¼"=1'-0"

DRAWING BY: COWI 1300 Clay Street, 7th Floor
Oakland, CA 94612
Tel.: 510.839.8972
Fax: 510.839.9715
Website: www.cowi-na.com

CONTACT: JAMES KEARNEY, PE
(510)267-7170

DATUM: MLLW

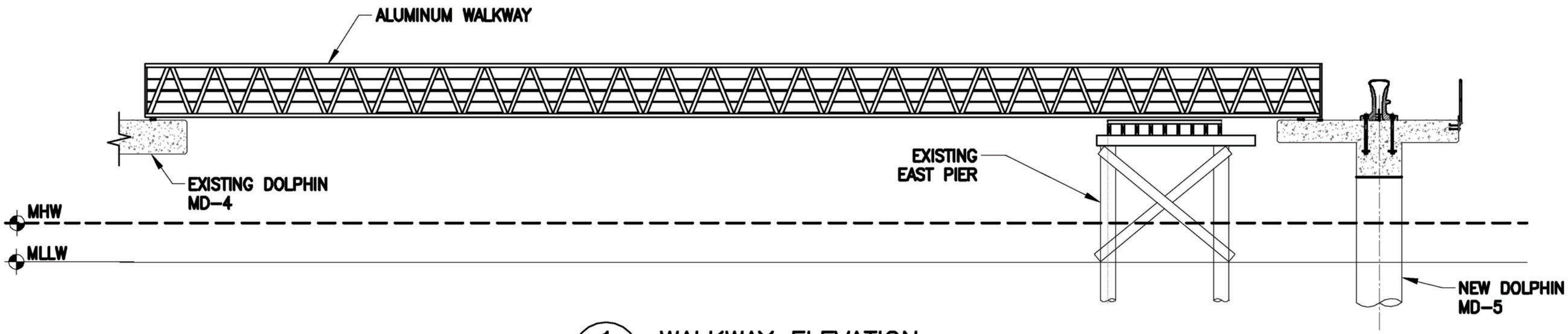
WALKWAY SECTION

SCALE: AS SHOWN

AMPORTS
2301-2603 WILBUR AVENUE
ANTIOCH, CA 94509

ANTIOCH WHARF - PULP TO RORO
BERTH CONVERSION PROJECT

SHEET S-12 | DATE: 2-05-18



1 – WALKWAY ELEVATION
1/16"=1'-0"

DRAWING BY: COWI
1300 Clay Street, 7th Floor
Oakland, CA 94612
Tel.: 510.839.8972
Fax: 510.839.9715
Website: www.cowi-na.com

CONTACT: JAMES KEARNEY, PE
(510)267-7170

DATUM: MLLW

WALKWAY ELEVATION

SCALE: AS SHOWN

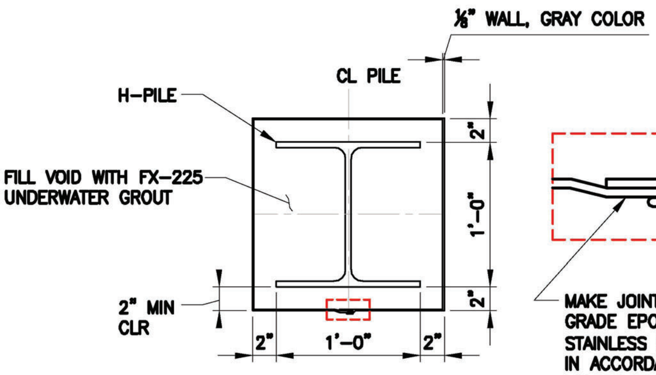
AMPORTS
2301-2603 WILBUR AVENUE
ANTIOCH, CA 94509

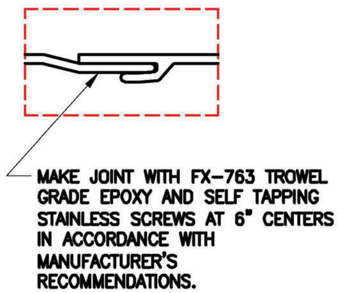
ANTIOCH WHARF - PULP TO RORO BERTH CONVERSION PROJECT

SHEET **S-13**

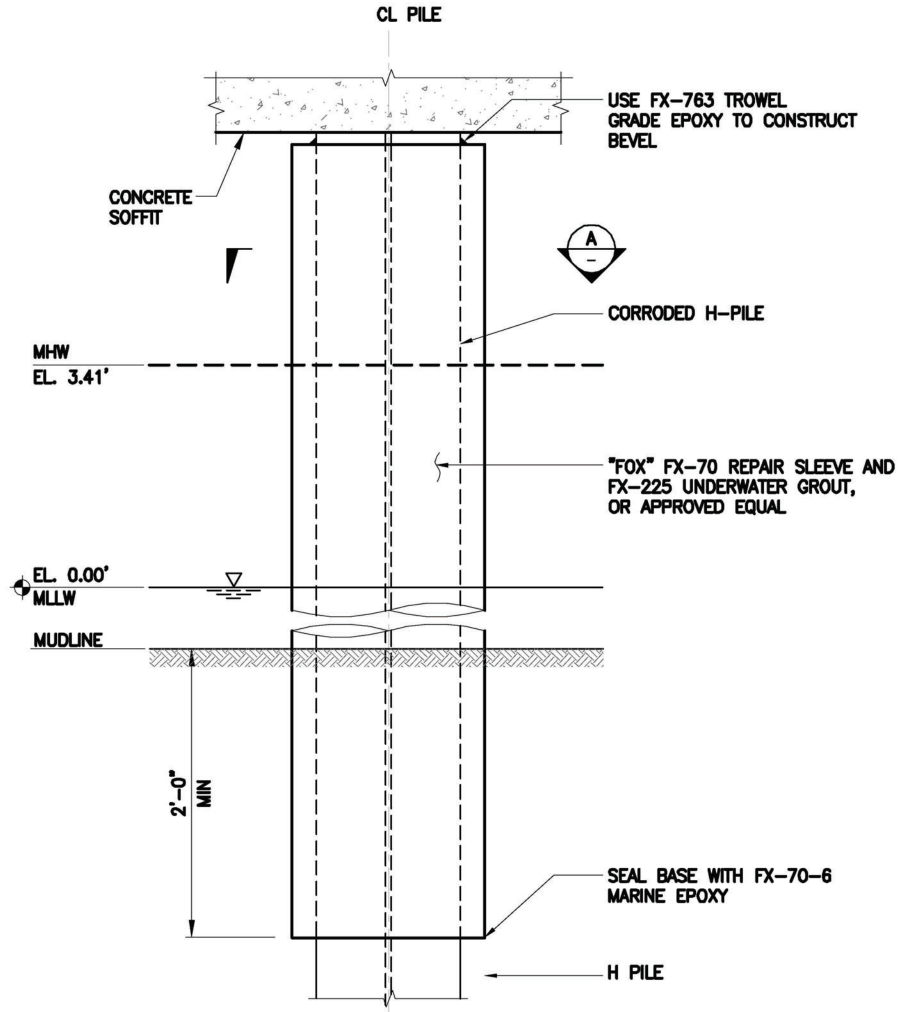
DATE: **2-05-18**

FILE LOCATION: O:\A100000\A104430\CAD\TASK 300\A104430-PERMIT SET\A104430-AMPORTS-S-03_PERMIT.DWGDATE: 2/5/2018 2:29:58 PM DRAFTSPERSON: JULIUS BACINILLO





A SECTION
–
3/4"=1'-0"



1 ELEVATION – PILE REPAIR: SLEEVE
–
3/4"=1'-0"

0 1 2 3 FT
¾"=1'-0"

NOTES:

1. INSTALL SLEEVE AT PILE.
2. CLEAN PILE OF MARINE GROWTH AND DELETERIOUS MATERIALS.
3. INSTALL SLEEVE AROUND PILE EXTENDING 2' INTO MUDLINE AND MAKE JOINT. USE STANDOFFS TO ACHIEVE 2" ANNULUS
4. INSTALL FX-70-6 MARINE EPOXY IN BOTTOM 4" OF ANNULUS. CURE.
5. INSTALL FX-225 UNDERWATER GROUT. HOLD BACK 6" FROM TOP.
6. INSTALL FX-763 TROWEL GRADE EPOXY AT TOP 6".

FILE LOCATION: O:\A100000\A104430\CAD\TASK 300\A104430-PERMIT SET\A104430-AMPORTS-S-03 PERMIT.DWGDATE: 2/5/2018 2:30:04 PM DRAFTSPERSON: JULIUS BACINILLO

DRAWING BY: COWI

1300 Clay Street, 7th Floor
Oakland, CA 94612
Tel.: 510.839.8972
Fax: 510.839.9715
Website: www.cowi-na.com

CONTACT: JAMES KEARNEY, PE
(510)267-7170

DATUM: MLLW

STRUCTURAL REPAIRS
PILE SLEEVE

SCALE: AS SHOWN

AMPORTS
2301-2603 WILBUR AVENUE
ANTIOCH, CA 94509

ANTIOCH WHARF - PULP TO RORO BERTH CONVERSION PROJECT

SHEET S-14

DATE: 2-05-18

Appendix D

NMFS Pile Driving Calculations

Project Title	AMPORTS Wharf Rehabilitation
Pile information (size, type, number, pile strikes, etc.)	72- inch steel shell pile. 1,600 strikes.

Fill in green cells: estimated sound levels and distances at which they were measured, estimated number of pile strikes per day, and transmission loss constant.

	Acoustic Metric			
	Peak	SEL	RMS	Effective Quiet
Measured single strike level (dB)	**206**	**176**	**188**	**150**
Distance (m)	**10**	**10**	**10**	

Estimated number of strikes	**1600**

Cumulative SEL at measured distance
208.04

	Distance (m) to threshold			
	Onset of Physical Injury			Behavior
	Peak	Cumulative SEL dB**		RMS
	dB	Fish ≥ 2 g	Fish < 2 g	dB
Transmission loss constant (15 if unknown)	206	187	183	150
15	**10**	**253**	**467**	**3415**

** This calculation assumes that single strike SELs < 150 dB do not accumulate to cause injury (Effective Quiet)

Notes (source for estimates, etc.)

Illingworth and Rodkin 2017. Final Acoustic Monitoring Report for GP Antioch Wharf Project.

Project Title	
Pile information (size, type, number, pile strikes, etc.)	24-inch octagonal concrete. Assume 500 strikes per pile to set.

Fill in green cells: estimated sound levels and distances at which they were measured, estimated number of pile strikes per day, and transmision loss constant.

	Acoustic Metric			
	Peak	SEL	RMS	Effective Quiet
Measured single strike level (dB)	**186**	**163**	**174**	**150**
Distance (m)	**10**	**10**	**10**	

Estimated number of strikes	**500**

Cumulative SEL at measured distance
189.99

	Distance (m) to threshold			
	Onset of Physical Injury			Behavior
	Peak	Cumulative SEL dB**		RMS
	dB	Fish ≥ 2 g	Fish < 2 g	dB
Transmission loss constant (15 if unknown)	206	187	183	150
15	**0**	**16**	**29**	**398**

** This calculation assumes that single strike SELs < 150 dB do not accumulate to cause injury (Effective Quiet)

Notes (source for estimates, etc.)

Appendix E

EFH Assessment

Supplemental Essential Fish Habitat Information for AMPORTS Antioch Berth Conversion

The proposed Project is located within an area designated as Essential Fish Habitat (EFH) for three Fishery Management Plans (FMPs); the Coastal Pelagic Species, Pacific Groundfish, and Pacific Salmon Management Plans. Details of the location, purpose, and description of the proposed Project, along with minimization and avoidance measures, are discussed in the Biological Assessment (BA). A table of EFH within the Action Area identified in the BA, and the anticipated effect is provided below.

Essential Fish Habitat	Effect Determination
Coastal Pelagic Species	Not Likely to Destroy or Adversely Modify
Pacific Groundfish	Not Likely to Destroy or Adversely Modify
Pacific Salmon	Not Likely to Destroy or Adversely Modify

Background

The Magnuson-Stevens Act (as amended by the Sustainable Fisheries Act) requires FMPs to "describe and identify essential fish habitat …, minimize to the extent practicable adverse effects on such habitat caused by fishing, and identify other actions to encourage the conservation and enhancement of such habitat" (§303(a)(7)). The Magnuson-Stevens Act defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." NMFS interpreted this definition in its regulations as follows: "waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish, and may include areas historically used by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means "the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem"; and "spawning, breeding, feeding, or growth to maturity" covers the full life cycle of a species (§303(a)(7)). A brief description of each FMP for the Action Area is provided below.

The Pacific Coast Groundfish FMP manages 90-plus species over a large and ecologically diverse area (PFMC 2011a). EFH for Pacific Coast Groundfish is defined as the aquatic habitat necessary to allow for groundfish production to support long-term sustainable fisheries for groundfish and a healthy ecosystem.

The Coastal Pelagic Species fishery includes four finfish Pacific sardine (*Sardinops sagax*), Pacific [chub] mackerel (*Scomber australasicus*), northern anchovy (*Engraulis mordax*), and jack mackerel (*Trachurus symmetricus*), along with invertebrates, market squid (*Loligo opalescens*) and all krill (*Euphausiacea* spp) species that occur in the U.S. West Coast exclusive economic zone (EEZ) (PFMC 2011b). EFH for Coastal Pelagic Species includes all marine and estuarine waters from the shoreline along the coasts of California, Oregon, and Washington offshore to the limits of the EEZ and above the thermocline where sea surface temperatures range between 10˚C to 26˚C (PFMC 2011b). The Coastal Pelagic Species FMP also includes two Ecosystem Component Species; jacksmelt (*Atherinopsis californiensis*) and Pacific herring (*Clupea pallasii*).

The Pacific salmon FMP covers two species in California; Chinook salmon (*Oncorhynchus tshawytscha*) and coho salmon (*O. kisutch*). EFH for Pacific salmon means those waters and substrates necessary for production needed for a health ecosystem and support a sustainable fishery.

Analysis of Effects to EFH

Direct Effects

Direct effects are those effects caused directly by the proposed Action that occur on-site within the Action Area and during Action implementation, i.e., ground disturbance within the Action Area.

The Action will remove existing creosote treated pilings and will rehabilitate the current wharf structure to support a RORO ramp as well as new breasting dolphins and mooring dolphins. Addition of the RORO ramp and rehabilitation of existing structures will increase overwater structures, thereby increasing overwater shading. New overwater structures will be supported by steel and concrete piles. The new piles as well as overwater structures associated with the berth conversion will result in a permanent increase in shading of 9,228 square feet (0.21 acre) with an increase of 220 cubic yards of fill (BA Table 3 and 4). To mitigate the effects of shading and fill, the Action will purchase mitigation credits at an approved bank such as Liberty Island. Any effects caused by shading will be fully offset by the purchase of mitigation credits. In addition, the removal of creosote piles and retrofitting of the wharf with light penetrating structures will further provide beneficial effects to EFH, helping to offset any impacts. The purchase of mitigation credits, combined with the beneficial effects of removing creosote treated piles, and replacing solid structure with light penetrating surfaces will fully mitigate for impacts to EFH, resulting in no loss, reduction, or change in habitat features or functions for the three EFH FMPs.

Indirect Effect

Indirect effects are those caused by or those that will result from the proposed Action later in time, but are still reasonably certain to occur.

The impact of sea-level rise over the functional lifespan of the berth has been evaluated with the Project design, and is not anticipated to affect the berth. Additionally, steel components within the splash zone of the berth will have coatings or galvanization to protect them from corrosion. Indirect effects will not adversely affect EFH as a result of the Project.

Interrelated and Interdependent Effects

Interrelated actions are those actions that are part of the primary action and dependent upon that primary action for their justification. The only interrelated effect anticipated would be an increase in ship traffic following completion of the wharf.

In its current state the wharf is unusable. Once the wharf is rehabilitated, it will go back into regular service. Ships which will use the wharf are of similar size to those currently traveling through the area in route to the Ports of Stockton and Sacramento. Because the San Joaquin River is already maintained as a commercial channel for the Port of Stockton, and depths are sufficient to handle the ships anticipated to call on the wharf, dredging is not anticipated to be required as a result of the Action. Therefore, it is anticipated that the only interrelated effect will be an increase in vessel traffic. The combined traffic for the Port of Stockton and Port of Sacramento is estimated to be around 350 ships per year. The number of ships estimated to use the wharf is anticipated to peak at eight vessels per month. The number of vessels already using the two major ports far exceeds the numbers of ships expected to use the wharf. Additionally multiple marinas in the vicinity harbor several hundred personal watercraft which travel through the area daily. Therefore, given the number of heavy ships entering the Port of Stockton via the San Joaquin River, and the high number of personal watercraft harbored in the vicinity, it is not anticipated that the numbers of ships using the AMPORTS facility, even at full capacity would add significantly to disturbance of EFH.

Interdependent actions are those actions that have no independent utility apart from the primary action. Construction, maintenance, and use of a road required to access a site is an example of an interdependent effect.

Increased boat traffic around the wharf will result as part of the Action during construction. Work boats and material barges will be used to perform the Action. Effects from the use of work boats and material barges will last for the duration of the Action. Acoustic effects from the use of work boats and material barges are anticipated to be minimal, and are adequately captured in the Action Area as depicted. No interdependent effects are expected as a result of the Action because all construction activities are considered under the primary Action.

Cumulative Effects

Cumulative effects are those effects of future state or private activities, not involving federal activities, that are reasonably certain to occur within the action area of the federal action subject to consultation {50 CFR §402.02}. Future dredging or new dock projects would be considered cumulative effects.

Following rehabilitation of the wharf, the number of vessels using the wharf is anticipated to increase, however this effect has been analyzed as an interrelated effect because it is dependent upon that primary action for justification. No additional dredging is required as waters along the berth side of the wharf are already sufficient depth to support berthing by large ships. There are also no currently proposed non-federal actions in the Action Area. Therefore, no cumulative effects are anticipated to occur.

<u>Conclusion</u>

The Action will result in an increase in shading and fill around the berth. However, between the removal of creosote piles, addition of light penetrating surfaces, and purchase of mitigation credits, any effects from increased shading would be mitigated. Following mitigation there will be no adverse change in habitat type or function for EFH as a result of the Action. Furthermore, the Action is not likely to destroy or adversely modify EFH.

APPENDIX C

AMPORTS Antioch Vehicle Processing Facility Project

Cultural Resources Inventory Report

June 30, 2021

Prepared for:

City of Antioch
200 H Street
Antioch, CA 94509

Prepared by:

Stantec Consulting Services Inc.
1383 North McDowell Boulevard, Suite 250
Petaluma, CA 94954

Table of Contents

LIST OF APPENDICES

Acronyms and Abbreviations

AB 52	Assembly Bill 52
ACHP	Advisory Council on Historic Preservation
API	Area of Potential Impacts
APN	Assessor’s Parcel Number
CFR	Code of Federal Regulations
CCR	California Code of Regulations
CHRIS	California Historical Resources Information System
City	City of Antioch
CEQA	California Environmental Quality Act
CRHR	California Register of Historical Resources
NAHC	Native American Heritage Commission
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
NWIC	Northwest Information Center
PRC	Public Resources Code
SLF	Sacred Lands File
Stantec	Stantec Consulting, Inc.
TCR	Tribal Cultural Resources
USACE	United States Army Corps of Engineers

Executive Summary

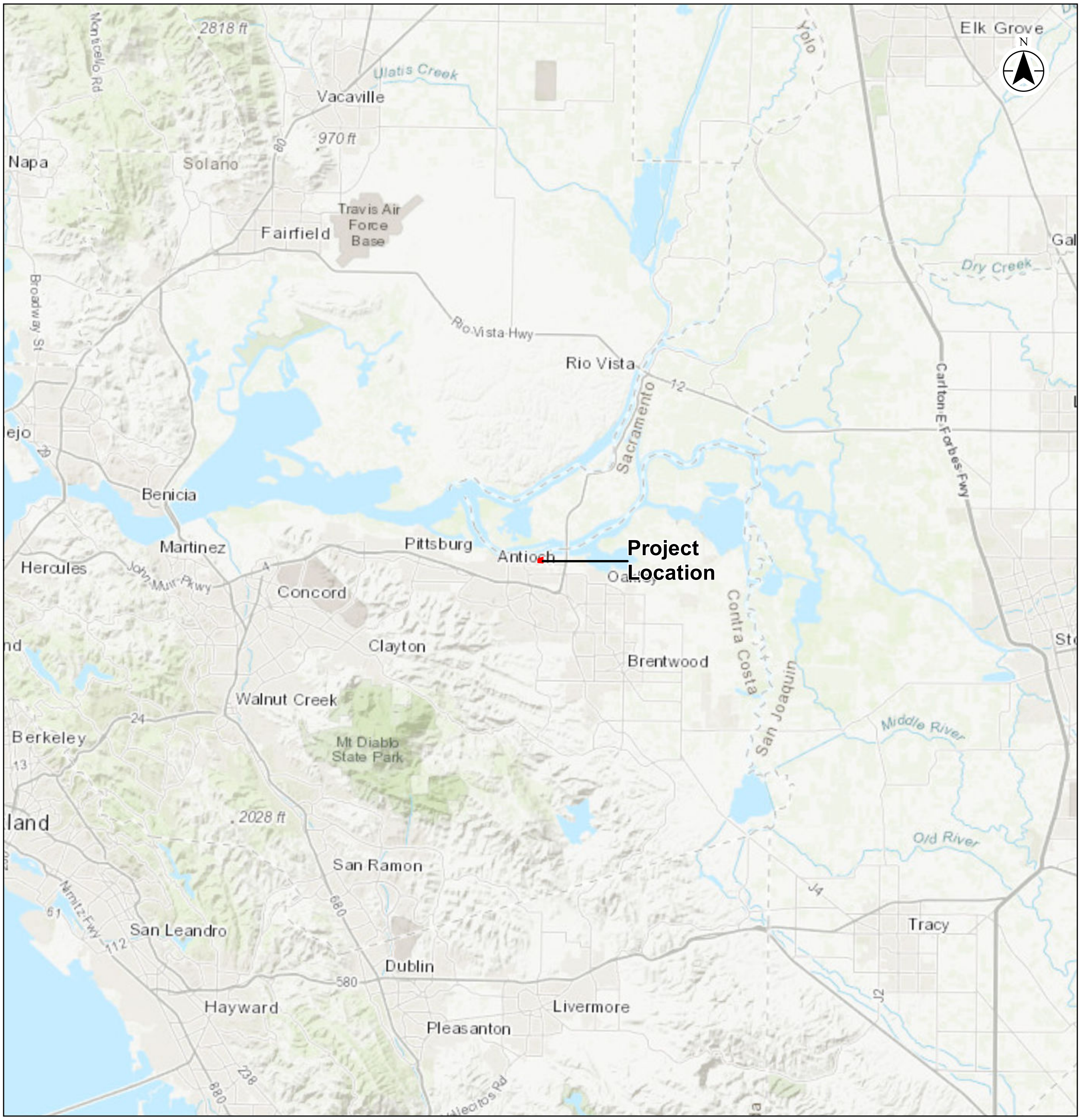
Stantec Consulting Services Inc. (Stantec) prepared this cultural resources inventory on behalf of the City of Antioch for the proposed APORTS Antioch Vehicle Processing Facility Project. This study, conducted in April and May 2021, includes the results of a record search, desktop review of available literature, and Native American outreach and consultation. No pedestrian archaeological field survey was performed for this study due to the built environment context of the Project area. Stantec archaeologist Leven Kraushaar, who meets the Secretary of the Interior's Standards and Guidelines for Archaeology (36 Code of Federal Regulations [CFR] Part 61), prepared this report. No previously recorded cultural resources were identified within the Area of Potential Impact (API) during the record search, literature review, and Native American consultation. A portion of a rail line (P-07-000806/CA-CCO-732H) previously evaluated and found ineligible for listing on the National Register of Historic Places (NRHP) or the California Register of Historical Resources (CRHR), was identified within the API during the survey. The Crown Zellerbach wharf within the API has also been evaluated and recommended ineligible for the NRHP or CRHR. No other resources were recorded. The Project is therefore not expected to impact cultural resources.

1.0 PROJECT LOCATION AND DESCRIPTION

AMPORTS proposes to develop an automotive logistics and processing facility in the City of Antioch, Contra Costa County, California (Figure 1). The Project is on property located at 2301 Wilbur Avenue, within Assessor's Parcel Number (APN) 051-020-006 and APN 051-020-012. Site improvements include upgrading and converting the existing wharf to support roll-on/roll-off operations, constructing one pre-engineered 25,328 square foot metal building for staff offices, restrooms, and vehicle processing and workspace, and grading, fencing, paving, and striping for car storage and loading areas. Project activities also include the demolition of existing raised slab foundations and out of service utilities and the installation of new utility connections and on-site stormwater improvements. Two existing structures, a guardhouse and a 5,000 square foot storage building, will remain in place. Project activities do not include any use of an existing railroad spur at the site.

Area of Potential Impacts

The Project Area of Potential Impacts (API) encompasses all areas of potential ground disturbance, including excavation, access, and staging and layout areas. Vertical disturbances, such as may be required for excavations for building foundations and the construction of associated underground utilities, are also considered within the API. The total area of the API is approximately 38.9 acres (Figure 2).



0 5 10 Miles

1:500,000 (at original document size of 8.5x11)

Stantec

Project Location
Antioch, California

Prepared by TM on 2021-03-16

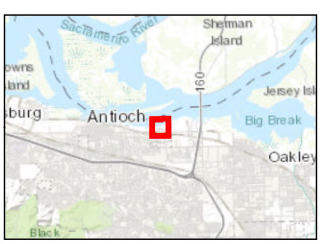
Client/Project
City of Antioch
Amports Antioch Vehicle Processing Facility Project

Figure No.
1

Title
Regional Overview

Notes
1. Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
2. Base Map: Esri World Topographic Map web mapping service

U:\185705365\03_data\gis_cad\gis\mxds\185705365_figure_1_Regional_Overview.mxd Revised: 2021-03-16 By: tmooney



Project Site

0 200 400 Feet

1:4,800 (at original document size of 8.5x11)

Stantec

Project Location
Antioch, California

Prepared by TM on 2021-03-16

Client/Project
City of Antioch
Amports Antioch Vehicle Processing Facility Project

Figure No.
2

Title
Project Site Location

Notes
1. Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
2. Base Map: Esri World Imagery web mapping service

U:\185705365\03_data\gis_cad\gis\mxds\185705365_figure_2_Project_Site_Location.mxd Revised: 2021-03-16 By: tmooney

2.0 REGULATORY CONTEXT

This Project is subject to the requirements of the California Environmental Quality Act (CEQA) of 1970 as amended and CEQA Guidelines, codified in Title 14 of the California Code of Regulations (CCR), which provide agencies guidance for compliance with environmental regulations. The City of Antioch is the lead CEQA agency for the Project. Since the Project could affect waters of the United States, it may require a United States Army Corps of Engineers (USACE) permit. If a USACE permit is required, the Project would be considered an undertaking subject to compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and its implementing regulations (36 Code of Federal Regulations [CFR] 800). This evaluation was conducted pursuant to Section 106 and CEQA guidelines in anticipation of the need for state and federal permits.

2.1 CALIFORNIA ENVIRONMENTAL QUALITY ACT

Historical and archaeological resources are afforded consideration and protection by CEQA (14 CCR Section 21083.2, 14 CCR Section 15064). CEQA Guidelines define significant cultural resources under two regulatory designations: historical resources and unique archaeological resources.

A historical resource is a “resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources (CRHR);” or “a resource listed in a local register of historical resources or identified as significant in a historical resource survey meeting the requirements of Section 5024.1(g) of the Public Resources Code (PRC);” or “any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the agency’s determination is supported by substantial evidence in light of the whole record” (14 CCR Section 15064.5[a][3]).

Historical resources automatically listed in the CRHR include California cultural resources listed in or formally determined to be eligible for the National Register and California Historical Landmarks list from No. 770 onward (PRC 5024.1[d]). Locally listed resources are entitled to a presumption of significance unless a preponderance of evidence in the record indicates otherwise.

Under CEQA, a resource is generally considered historically significant if it meets the criteria for listing in the CRHR.

Assembly Bill 52 and Tribal Cultural Resources

Assembly Bill (AB) 52 establishes a formal role for California Native American tribes in the CEQA process. CEQA lead agencies are required to consult with tribes about potential Tribal Cultural Resources (TCR) in the project area, the potential significance of project impacts, the development of project alternatives, and the type of environmental document that should be prepared.

2.2 NATIONAL HISTORIC PRESERVATION ACT

The NHPA of 1966, as amended, requires federal agencies, or those they fund or permit, to consider the effects of their actions on historic properties. The Advisory Council on Historic Preservation (ACHP) Section 106 implementing regulations (36 CFR Part 800) define “historic properties” as follows:

- Any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (NRHP) maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization that meet the NRHP criteria (36 CFR Part 800.16[l]).

To determine whether an undertaking could affect NRHP eligible properties, cultural resources, including archaeological, ethnographical, and architectural properties, must be inventoried and evaluated for listing in the NRHP. For a property to be considered for inclusion in the NRHP, it must be at least 50 years old and meet the criteria for evaluation set forth in 36 CFR Part 60.4, as follows:

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

If a particular resource meets one of these criteria, it is considered a historic property eligible for listing in the NRHP. Among other criteria considerations, a property that has achieved significance within the last 50 years is not considered eligible for inclusion in the NRHP unless certain exceptional conditions are met.

A full explanation of the procedures for evaluating historic resources can be found in publications issued by the National Park Service, including National Register Bulletin 15, How to Apply the National Register Criteria for Evaluation (NPS 1983).

3.0 ENVIRONMENTAL CONTEXT

This section provides an overview of the natural environment and the prehistoric, ethnographic, and historic setting of the Project. This information provides the context necessary to identify and interpret cultural resources within the API.

3.1 GEOLOGY AND GEOMORPHOLOGY

The Project is in the Central Valley Ecoregion of California's Great Central Valley Geomorphic Province. This region is characterized by intensively farmed plains at elevations ranging from 100 to 300 feet with long, hot, dry summers and mild winters (Griffith et al. 2016). The geological age of the project area is Quaternary (CGS 2010; Koenig 1963), and local land formations are mainly Quaternary sand deposits and unidentified alluvium (CGS 2010). Soils in the Project area consist of Delhi sands, which are excessively drained deposits derived from igneous and sedimentary rock. Delhi sands are found on alluvial fans, flood plains, and terraces and have two to nine percent slopes (NRCS 2021a/b). While Quaternary alluvium is generally considered sensitive for cultural resources due to its age and depositional history, the undifferentiated nature of soils within the API, the extensive use of imported fill material to create the northern half of the API, and the high levels of previous disturbance apparent over the southern half of the Project area suggest a low to moderate sensitivity for buried cultural resources (Meyer and Rosenthal 2007).

3.2 PREHISTORIC AND ETHNOGRAPHIC OVERVIEW

The Project is within the traditional tribal territory of the Bay Miwok, or *Saclan*, one of the five linguistic divisions of Eastern Miwok peoples (Levy 1978; Kroeber 1925; Map 1). Linguistic evidence suggests that the Eastern Miwok have inhabited the region for a long period of time, perhaps as early as the Middle Horizon of California prehistory (4,000 to 1,500 year before present) (Levy 1978; Breschini 1983). Around the time of European contact, the Bay Miwok occupied the eastern portions of Contra Costa County from Walnut Creek to the Sacramento-San Joaquin Delta (Levy 1978).

The foremost political unit of the Bay Miwok was the tribelet, an independent nation with defined geographical boundaries. Within their territory, each tribelet occupied one or more semi-permanent settlements and several seasonally occupied camps. Members of the tribelet moved between camps to fish, hunt, and gather resources as they became locally available (Levy 1978). The nearest ethnographically recorded village, *Julpun*, was located approximately 1.8 miles north-northeast of the Project (Bennyhoff 1977); however, knowledge of individual tribelets and settlement locations is fragmentary due to rapid depopulation and relocation occurring throughout the 19th century (Levy 1978).

Within villages and camps, Miwok structures at lower elevations usually consisted of conical frames thatched with brush, grass, or tules (*Schoenoplectus acutus and californicus*). Larger semisubterranean and circular brush structures were also constructed for communal use at village sites, and granaries were built for the storage of gathered food, primarily acorns from several types of oak (*Quercus spp*.) (Levy 1978). The Miwok also collected buckeye (*Aesculus californica*), hazelnut (*Corylus cornuta*), and pine nuts from digger pine (*Pinus sabiniana*) and sugar pine (*Pinus lambertiana*). A wide variety of seeds were also collected when available. Important terrestrial animal foods included mule deer (*Oedocoileus hemionus*), tule elk (*Cervuus nannodes*), and pronghorn antelope (*Antilocapra americana*). Salmon and trout (*Oncorhynchus spp.*), sturgeon (*Acipenser transmontanus*), and lamprey (*Lampetra tridentata*) were also important food species for all divisions of the Eastern Miwok (Levy 1978) and would have been especially important for indigenous peoples in the vicinity of the Project due to local environmental conditions and the proximity of wetlands (Tang 2009).

After initial contacts with Spanish explorers, the Bay Miwok were among the first indigenous people to be gathered into the Spanish missions. Subsequent influxes of Euro-Americans drove many of the remaining native inhabitants to hide in the delta, and later conflicts ended with the confiscation of Miwok lands by the United States government. Miwok populations, estimated to have been around 19,500 in 1808, rapidly declined to around 670 by 1910 (Cook 1943).

3.3 HISTORIC OVERVIEW

The historic period in Contra Costa County begins with the earliest incursions of Spanish explorers. The first of these expeditions to pass through the Antioch area was led by Don Pedro Fages and Padre Juan Crespi in 1772. Following favorable reports by early explorers, a series of 21 Spanish missions were founded throughout California, the nearest of which, Mission San Jose de Guadalupe in Fremont, is approximately 33 miles southwest of the Project area.

After Mexico obtained independence from Spain in 1821, the Mexican government divided former mission lands into large land grants known as *ranchos* and transferred ownership to private individuals. The Project is not located within one of these former Mexican land grants. The nearest rancho, Los Medanos, is approximately 1.57 miles west of the (Beck and Haas 1974), and no development associated with Los Medanos appears to have occurred in the Project vicinity.

With the signing of the Treaty of Guadalupe Hidalgo at the conclusion of the Mexican-American War in 1848, Mexico was forced to cede California to the United States. Soon after, two of the earliest American settlers, the Smith brothers, arrived. The brothers bought land near Antioch from John Marsh to establish Smith's Landing, an outpost providing supplies and services to gold miners. The City of Antioch was founded soon after in 1850 to 1851 and incorporated in 1872, becoming the oldest city in Contra Costa County (Tang 2009).

Coal was discovered south of Antioch in the 1850s, and the area's coal mining industry briefly flourished (City of Antioch 2009). Through the 1860s and 1870s, however, grain production overtook coal to become the foundation of the local economy. Railroads, originally built to support coal mining, arrived in 1878, ultimately contributing to the expansion of the agricultural sector and supporting later industrial development in the region (City of Antioch 2009). Manufacturing also flourished in Antioch throughout the late 18th and early 19th centuries, including brickmakers attracted by the presence of sand deposits along the San Joaquin River, and paper producers drawn by access to the agricultural products in the area. The Zellerbach paper mill, the former site of which is within the API, was among these local paper production facilities (Beard 2019).

The general economic boom experienced during and after World War II spurred large-scale growth in Antioch, and the subsequent development of the US highway system and the expansion of deep-water shipping continued to support economic and population growth through the mid-20th century and to the present day (City of Antioch 2009).

Crown Zellerbach Wharf

The Crown Zellerbach wharf was built in 1956 to serve the paper mill. Beard (2019) formally evaluated the wharf by reviewing available historical documents and a conducting a field examination of the wharf and associated properties. While the wharf is over 50 years old, the evaluation determined that the wharf does not meet any of the applicable evaluation criteria and is not eligible for listing on the NRHP or CRHR. The wharf, therefore, does not constitute an historical resource, and no significant impact will occur as the result of Project activities. The evaluation report is included as Appendix B. Please see the report for a detailed description of the wharf and evaluation efforts and findings.

4.0 METHODS AND FINDINGS

4.1 NATIVE AMERICAN CONSULTATION

On March 16, 2020, Stantec sent an email with a Project description and a map depicting the Project area to the Native American Heritage Commission (NAHC) requesting a review of the Sacred Lands File (SLF) for Native American cultural resources that might be affected by the Project. The NAHC responded on March 25, 2021 stating that the results of the SLF search were negative.

The NAHC provided a list of sixteen (16) Native American individuals and organizations to contact for additional information about sacred sites or TCRs in the Project vicinity:

- Irene Zwierlein (Chairperson, Amah Mutsun Tribal Band of Mission San Juan Bautista)
- Lloyd Mathiesen (Chairperson, Chicken Ranch Rancheria of Me-Wuk Indians)
- Donald Duncan (Chairperson, Guidiville Indian Rancheria)
- Ann Marie Sayers (Chairperson, Indian Canyon Mutsun Band of Costanoan)
- Kanyon Sayers-Roods (MLD Contact, Indian Canyon Mutsun Band of Costanoan)
- Charlene Nijmeh (Chairperson, Muwekma Ohlone Indian Tribe of the SF Bay Area)
- Monica Arellano (Vice Chairwoman, Muwekma Ohlone Indian Tribe of the SF Bay Area)
- Cosme Valdez (Chairperson, Nashville Enterprise Miwok-Maidu-Nishinam Tribe)
- Katherine Erolinda Perez (Chairperson, North Valley Yokuts Tribe)
- Timothy Perez (MLD Contact, North Valley Yokuts Tribe)
- Andrew Galvan (The Ohlone Indian Tribe)
- Jesus Tarango (Chairperson, Wilton Rancheria)
- Steven Hutchason (Tribal Heritage Preservation Officer, Wilton Rancheria)
- Neil Peyron (Chairperson, Tule River Indian Tribe)
- Dahlton Brown (Director of Administration, Wilton Rancheria)
- Corrina Gould (Chairperson, The Confederated Villages of Lisjan)

The City, as Lead Agency, opted to send certified notification letters to each of the individuals and organizations identified by the NAHC on April 8, 2021. The letters contained a description of the Project and Project location, a map of the Project area, an invitation to consult on the Project, and contact information and asked for responses within 30 days. Follow up phone calls were made to each contact on May 5 and 6, 2021.

Kanyon Sayers-Roods of the Indian Canyon Mutsun Band of Costanoan responded to the initial notification letters and requested additional information and a meeting with the City planner. City associate planner Zoe Merideth and Stantec archaeologist Leven Kraushaar met with Ms. Sayers-Roods by video conference call on April 28, 2021 to discuss Ms. Sayers-Roods concerns. Ms. Sayers-Roods expressed the Tribe's interest in honoring Truth in History through the provision of interpretive materials and in protecting and providing access to the natural environment. In addition, Ms. Sayers-Roods recommended tribal monitoring due to the proximity of the San Joaquin River, which may indicate an increased sensitivity for cultural resources. Ms. Sayers-Roods did not identify specific TCRs within the API. Additional project information and alternative measures, including worker awareness training and inadvertent discovery protocols were sent to the Tribe for review on May 5, 2021. The Tribe did not respond with additional comments or concerns.

Chairperson Lloyd Mathiesen of the Chicken Ranch Rancheria of Me-Wuk Indians was reached by telephone on May 6, 2021. Mr. Mathiesen stated that the Project is outside of the Tribe's territory and suggested consulting other local tribes, including the Ohlone or Coast Miwok.

In response to a follow-up telephone call placed on May 6, 2021, Kerri Vera of the Tule River Indian Tribe requested additional Project information, including a description of cultural resources identification efforts and results. This information was transmitted to Ms. Vera by email on May 10, 2021. The Tule River Tribe did not respond with any additional comments.

The City identified one additional tribe, the Ione Band of Miwok Indians, that had previously requested notification under AB 52 but that was not on the list provided by the NAHC. A notification letter and email were sent to the Ione Band on June 16, 2021. A follow up call was made to the tribal office on June 28, 2021. Tribal staff instructed Stantec to contact the Tribe's cultural committee by email. A digital copy of the notification letter and Project maps were sent to the cultural committee on June 29, 2021. As of June 30, 2021, no additional responses have been received. All documents related to Native American outreach and consultation can be found in Appendix A.

4.2 RECORD SEARCH AND DESKTOP REVIEW

Professional research staff at the Northwest Information Center (NWIC) of the California Historical Resources Information Center (CHRIS) at Sonoma State University, Rohnert Park conducted a search of all available records for the Project area and a 0.5-mile buffer around the Project area on April 23, 2021 (NWIC file no. 20-1802). The search included a review of the Office of Historic Preservation's California Historical Landmarks database, the National Register of Historic Places, and available historic topographic maps, Bureau of Land Management General Land Office plat maps, and aerial photographs.

One (1) cultural resources study has been conducted within the Project area. An additional 21 studies were identified within 0.5-mile of the API (Table 1).

Table 1. Previous Cultural Resources Studies Within 0.5-Mile of the Project

Study Number S-	Author	Year	Title	Location
10040	Bramlette, Allan, Mary Praetzellis, Adrian Praetzellis, and David A. Fredrickson	1988	Archaeological and Historical Resources Within the Los Vaqueros/Kellogg Study Area, Contra Costa and Alameda Counties, California	Buffer

Study Number S-	Author	Year	Title	Location
11826	Theodoratus, Dorothea J., Mary Pyle Peters, Clinton M. Blount, Pamela J. McGuire, Richard D. Ambro, Michael Crist, Billy J. Peck, and Myrna Saxe	1980	Montezuma I and II Cultural Resources	API
13797	Holman, Miley Paul	1991	Archaeological Field Inspection of the APC Project Area, Antioch, Contra Costa County, California (letter report)	Buffer
17993	Hatoff, Brian, Barb Voss, Sharon Waechter, Stephen Wee, and Vance Bente	1995	Cultural Resources Inventory Report for the Proposed Mojave Northward Expansion Project	Buffer
18440	West, G. James, and Patrick Welch	1996	Class II Archaeological Survey of the Contra Costa Canal, Contra Costa County, California	Buffer
22464	Jones and Stokes Associates, Inc.	1999	Cultural Resource Inventory Report for the Williams Communications, Inc. Fiber Optic Cable System Installation Project, Pittsburg to Sacramento, California	Buffer
23665	Quivik, Fredric L.	2000	Determination of Eligibility for the Contra Costa Power Plant	Buffer
23674	Moratto, Michael J., Richard M. Pettigrew, Barry A. Price, Lester A. Ross, Randall F. Schalk, Rick Atwell, Andrew Bailey, Gary Bowyer, Robert U. Bryson, Tim Canaday, Dianne Gardner, William Hildebrandt, Kurt T. Katsura, Clayton G. Lebow, Pat Mikkelsen, Scott Mumma, Lynda Sekora, Nancy D. Sharp, Craig Skinner, Lou Ann Speulda, Sharon Waechter, and Judith A. Willig	1994	Archaeological Investigations, PGT-PG&E Pipeline Expansion Project, Idaho, Washington, Oregon, and California: Volume 1 Project Overview, Research Design and Archaeological Inventory	Buffer
24015	Ashkar, Shahira	2001	Cultural Resource Inventory Report for the Montezuma Enhancement Site, Southern Energy's Multispecies Habitat Conservation Plan for Pittsburg and Contra Costa Power Plants, Solano and Contra Costa Counties, California	Buffer
27049	St. Claire, Michelle, and John Holson	2003	Archaeological Survey Report for the Delta Diablo Sanitation District Bridgehead Improvements Project, City of Antioch, Contra Costa County	Buffer
29311	Dalldorf, Graham	2004	Letter Report of Archaeological Consultation for the Black Liquor Pond, East Mill Site, Gaylord Container Company, 2603 Wilbur Avenue, Antioch, California (letter report)	Buffer
30387	Tang, Bai "Tom," Michael Hogan, Josh Smallwood, and Terri Jacquemain	2005	Historical Resources Compliance Report, Burlington Northern Santa Fe Railway Double Track Project (Segment 2), Oakley (MP 1146.1) to Port Chicago (MP 1164.4), In and Near the Cities of Oakley, Antioch, and Pittsburg, and the Port Chicago Naval Weapons Station, Contra Costa County, California	Buffer
30579	Busby, Colin I.	2004	Cultural Resources Report, Delta Energy Center Site (DEC) and Associated Linears, Cities of Pittsburg and Antioch, Contra Costa County, California, California Energy Commission (CEC), Project 98-AFC-3C	Buffer
34412	Wohlgemuth, Eric	2005	Archaeological Reconnaissance of the Pacific Gas and Electric Company 230 kV Delta Transmission Line Reconductoring Project, Solano, Sacramento, and Contra Costa Counties, California	Buffer

Study Number S-	Author	Year	Title	Location
35861	Tang, Bai "Tom"	2009	Historic Property Survey Report, proposed undertaking to upgrade the capacity of the Burlington Northern Santa Fe (BNSF) Railway's mainline from Mile Post (MP) 1146.1 to MP 1164.4, between the City of Oakley and the Port Chicago Naval Weapons Station in Contra Costa County	Buffer
36622	Siskin, Barb, Cassidy DeBaker, and Jennifer Lang	2008	Cultural Resources Investigation and Architectural Evaluation for the Contra Costa to Las Positas Reconductoring of the 230 kV Transmission Line, Contra Costa County and Alameda County, California	Buffer
38392	Whitaker, Adrian	2010	PG&E Contra-Costa to Moraga Reconductoring Project (letter report)	Buffer
38884	Leach-Palm, Laura	2011	PG&E proposed natural gas pipeline integrity excavation for Line 191 and 191A (letter report)	Buffer
44292	Beck, Karin, Mark Hale, and Ben Elliott	2013	Cultural Resource Report, California Energy Commission Condition of Certification CUL-4, Contra Costa County, California (08-AFC-3C)	Buffer
46909	Rahimi-Fike, Aisha	2015	Delta Diablo Recycled Water System Expansion Project, Historical Resources Inventory and Evaluation Report, Contra Costa County, California	Buffer
49936	Peterson, Cher L.	2016	Cultural Resources Records Search Results for T-Mobile West, LLC Candidate BA51975B (PG&E Sports Complex) 1030 Apollo Court, Antioch, Contra Costa County, California (letter report)	Buffer
51807	Dougherty, John W.	1999	Historic Property Survey Report for the Wilbur Avenue Overhead, City of Antioch, Contra Costa County, California	Buffer

The record search did not identify any previously recorded resources within the Project area. Seven (7) historic-period resources were identified within 0.5-mile of the Project (Table 2).

Table 2. Previously Recorded Cultural Resources Within 0.5-Mile of the Project

Primary Number	Trinomial	Age	Resource Name	Location
P-07-000806	CA-CCO-732H	Historic	Atchison, Topeka, and Santa Fe Railroad	Buffer
P-07-000878	N/A	Historic	Marsh Landing	Buffer
P-07-002952	N/A	Historic	N/A	Buffer
P-07-004623	N/A	Historic	N/A	Buffer
P-07-004624	N/A	Historic	N/A	Buffer
P-07-004625	N/A	Prehistoric	N/A	Buffer
P-07-004629	N/A	Historic	N/A	Buffer

A review of historic aerial photographs and topographic maps identify a rail spur on the property. The rail spur is present prior to 1949 (NETR 2021) and may be associated with P-07-000806/CA-CCO-732H, the Atchison, Topeka, and Santa Fe Railroad. The railroad has been previously determined to be ineligible for listing on the NRHP or CRHR (Allen and Herbert 2008).

A review of historic aerial photographs and topographic maps identify one curved section of railroad track bisecting the site (NETR 2021). The track section appears to be a remnant of a rail spur providing access to the Atchison, Topeka, and Santa Fe Railroad (P-07-000806/CA-CCO-732H). The entire line has been determined ineligible for the NRHP or the CRHR (Allen and Herbert 2008). The spur is therefore not a historical resource for the purposes of CEQA.

4.3 FIELD METHODS

No field study was conducted for the Project. The entire Project area is within a built environment. All locations of planned construction activity are currently paved.

5.0 SUMMARY AND CONCLUSIONS

A record search, literature review, and Native American outreach and consultation were completed as part of this study. The records search did not identify any cultural resources in the API. A rail spur present in aerial photographs of the property may be associated with P-07-000806/CA-CCO-732H (Atchison, Topeka, and Santa Fe Railroad), which has been determined to be ineligible for listing on the NRHP or CRHR. The railroad and associated features are therefore not considered resources for the purposes of CEQA and do not require further management consideration.

The Crown Zellerbach wharf has also been formally evaluated. The evaluation report recommends the wharf ineligible for listing on the NRHP or CRHR. The wharf is therefore not considered a resource for the purposes of CEQA and does not require further management consideration. No additional prehistoric or historic-period cultural resources were identified during the archaeological pedestrian survey. Due to the high levels of previous disturbance, no intact cultural resources will likely be impacted by Project activities.

5.1 INADVERTENT DISCOVERY

There is always a possibility that subsurface archaeological deposits exist in the Project area since archaeological sites may be buried and show no surface manifestation. Prehistoric resources include, but are not limited to, chert or obsidian flakes; projectile points; mortars; pestles; and dark friable soil containing bone dietary debris, heat-affected rock, or human burials. Historic resources may include stone or adobe foundations or walls; structures and remains with square nails; and refuse deposits or bottle dumps, which are often located on the surface or in old wells or privies.

Stantec recommends that if previously unidentified cultural resources are encountered during Project implementation, altering the materials and their context shall be avoided. A professional archaeologist shall be contacted to evaluate the nature of the find within 24 hours of the discovery. A 50-foot buffer shall be put around the discovery, and Project personnel should not collect, move, or touch cultural resources until the assessment can be made.

5.2 HUMAN REMAINS

Section 7050 of the California Health and Safety Code states that it is a misdemeanor to knowingly disturb a human burial. Although unlikely, if human remains are encountered, all work must stop in the immediate vicinity of the discovered remains. The Humboldt County Coroner and a qualified archaeologist must be notified immediately so that an evaluation can be performed (PRC 7050). If the remains are deemed to be prehistoric or Native American, the Coroner must contact the NAHC so that a “Most Likely Descendant” can be designated and to provide further recommendations regarding treatment of the remains.

6.0 REFERENCES

Allen, Polly S., and Rand Hebert
2008 *Primary Record for P-07-000806/CA-CCO-732H*. California Department of Parks and Recreation (DPR) 523 Series Forms. Copies available from the Northwest Information Center, Sonoma State University, Rohnert Park.

Ashkar, Shahira
2001 *Cultural Resource Inventory Report for the Montezuma Enhancement Site, Southern Energy's Multispecies Habitat Conservation Plan for Pittsburg and Contra Costa Power Plants, Solano and Contra Costa Counties, California*. Copies available from the Northwest Information Center, Sonoma State University, Rohnert Park, Report Number S-24015.

Beard, Vicki R.
2019 *Historical Evaluation of the Former Crown Zellerbach Wharf, Antioch, contra Costa County, California*. Prepared by Tom Origer and Associates for WRA Associates. Copies available from the City of Antioch.

Beck, Karin, Mark Hale, and Ben Elliott
2013 *Cultural Resource Report, California Energy Commission Condition of Certification CUL-4, Contra Costa County, California (08-AFC-3C)*. Copies available from the Northwest Information Center, Sonoma State University, Rohnert Park, Report Number S-44292.

Beck, Warren A., and Ynez D. Haase
1974 *Historical Atlas of California*. University of Oklahoma Press, Norman.

Bennyhoff, James
1977 *Ethnography of the Plains Miwok*. Center for Archaeological Research at Davis Publications, Number 5. University of California, Davis.

Bramlette, Allan, Mary Praetzellis, Adrian Praetzellis, and David A. Fredrickson
1988 *Archaeological and Historical Resources Within the Los Vaqueros/Kellogg Study Area, Contra Costa and Alameda Counties, California*. Anthropological Studies Center, Sonoma State University. Copies available from the Northwest Information Center, Sonoma State University, Rohnert Park, Report Number S-10040.

Breschini, Gary S.
1983 *Models of Population Movements in Central California Prehistory*. Ph.D. Dissertation, Washington State University.

Busby, Colin I.
2004 *Cultural Resources Report, Delta Energy Center Site (DEC) and Associated Linears, Cities of Pittsburg and Antioch, Contra Costa County, California, California Energy Commission (CEC), Project 98-AFC-3C*. Copies available from the Northwest Information Center, Sonoma State University, Rohnert Park, Report Number S-30579.

CGS (California Geological Survey)
2010 Geologic Units of California (Map). California Department of Conservation, Sacramento.

City of Antioch
2009 *Hillcrest Station Area Specific Plan Draft Environmental Impact Report*. Prepared by Dyett and Bhatia. State Clearinghouse No. 2008052128.

Cook, Sherburne F.
1943 *The Conflict Between the California Indian and White Civilization, III: The American Invasion 1848-1870*. Ibero-American 23. Berkeley, California.

Dalldorf, Graham
2004 *Letter Report of Archaeological Consultation for the Black Liquor Pond, East Mill Site, Gaylord Container Company, 2603 Wilbur Avenue, Antioch, California*. Copies available from the Northwest Information Center, Sonoma State University, Rohnert Park, Report Number S-29311.

Dougherty, John W.
1999 *Historic Property Survey Report for the Wilbur Avenue Overhead, City of Antioch, Contra Costa County, California*. Copies available from the Northwest Information Center, Sonoma State University, Rohnert Park, Report Number S-51807.

Hatoff, Brian, Barb Voss, Sharon Waechter, Stephen Wee, and Vance Bente
1995 *Cultural Resources Inventory Report for the Proposed Mojave Northward Expansion Project.* Woodward-Clyde Consultants. Copies available from the Northwest Information Center, Sonoma State University, Rohnert Park, Report Number S-17993.

Holman, Miley P.
1991 *Archaeological Field Inspection of the APC Project Area, Antioch, Contra Costa County, California.* Holman and Associates. Copies available from the Northwest Information Center, Sonoma State University, Rohnert Park, Report Number S-13797.

Jones and Stokes Associates, Inc.
1999 *Cultural Resource Inventory Report for the Williams Communications, Inc. Fiber Optic Cable System Installation Project, Pittsburg to Sacramento, California*. Copies available from the Northwest Information Center, Sonoma State University, Rohnert Park, Report Number S-22464.

Koenig, James B.
1963 *Geologic Map of California*, Olaf P. Jenkins edition, Santa Rosa Sheet. California Division of Mines and Geology. (Second Printing, 1967)

Kroeber, A. L.
1925 *Handbook of the Indians of California*. University of California Publications. Dover Publications, New York, 1964 reprint.

Leach-Palm, Laura
2011 *PG&E proposed natural gas pipeline integrity excavation for Line 191 and 191A (letter report)*. Far Western Anthropological Research Group, inc. Copies available from the Northwest Information Center, Sonoma State University, Rohnert Park, Report Number S-38884.

Levy, Richard
1978 *Costanoan*. In *California*, edited by Robert F. Heizer, pp. 485-495. Handbook of North American Indians, Vol. 8, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Meyer, Jack, and Jeffrey S. Rosenthal
2007 *Geoarchaeological Overview of the Nine Bay Area Counties in Caltrans District 4. Prepared for Caltrans District 4 Office of Cultural Resources, Oakland, California*. On file at the Northwest Information Center, Sonoma State University, Rohnert Park, California.

Moratto, Michael J., Richard M. Pettigrew, Barry A. Price, Lester A. Ross, Randall F. Schalk, Rick Atwell, Andrew Bailey, Gary Bowyer, Robert U. Bryson, Tim Canaday, Dianne Gardner, William Hildebrandt, Kurt

T. Katsura, Clayton G. Lebow, Pat Mikkelsen, Scott Mumma, Lynda Sekora, Nancy D. Sharp, Craig Skinner, Lou Ann Speulda, Sharon Waechter, and Judith A. Willig
1994 *Archaeological Investigations, PGT-PG&E Pipeline Expansion Project, Idaho, Washington, Oregon, and California: Volume 1 Project Overview, Research Design and Archaeological Inventory*. Copies available from the Northwest Information Center, Sonoma State University, Rohnert Park, Report Number S-23674.

NETR (Nationwide Environmental Title Research)
2021 Historic Aerials. Online database. https://www.historicaerials.com.

NRCS (National Resource Conservation Service)
2021a Web Soil Survey. United States Department of Agriculture. Online database. https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx.
2021b Map Unit Description, Delhi Sand. United States Department of Agriculture. Online resource. https://soilseries.sc.egov.usda.gov/OSD_Docs/D/DELHI.html

NPS (National Park Service)
1983 *National Register Bulletin 15, How to Apply the National Register Criteria for Evaluation*. United States Department of the Interior

Peterson, Cher L.
2016 *Cultural Resources Records Search Results for T-Mobile West, LLC Candidate BA51975B (PG&E Sports Complex) 1030 Apollo Court, Antioch, Contra Costa County, California (letter report).* Copies available from the Northwest Information Center, Sonoma State University, Rohnert Park, Report Number S-49936.

Quivik, Fredric L.
2000 *Determination of Eligibility for the Contra Costa Power Plant*. Copies available from the Northwest Information Center, Sonoma State University, Rohnert Park, Report Number S-23665.

Rahimi-Fike, Aisha
2015 *Delta Diablo Recycled Water System Expansion Project, Historical Resources Inventory and Evaluation Report, Contra Costa County, California*. Copies available from the Northwest Information Center, Sonoma State University, Rohnert Park, Report Number S-46909.

Siskin, Barbra, Cassidy DeBaker, and Jennifer Lang
2008 *Cultural Resources Investigation and Architectural Evaluation for the Contra Costa to Las Positas Reconductoring of the 230 kV Transmission Line, Contra Costa County and Alameda County, California*. Copies available from the Northwest Information Center, Sonoma State University, Rohnert Park, Report Number S-36622.

St. Clair, Michelle, and John Holson
2003 *Archaeological Survey Report for the Delta Diablo Sanitation District Bridgehead Improvements Project, City of Antioch, Contra Costa County*. Copies available from the Northwest Information Center, Sonoma State University, Rohnert Park, Report Number S-27049.

Tang, “Tom” Bai
2009 *Historic Property Survey Report, Proposed Undertaking to Upgrade the Capacity of the Burlington Northern Santa Fe (BNSF) Railway's Mainline from Mile Post (MP) 1146.1 to MP 1164.4, Between the City of Oakley and the Port Chicago Naval Weapons Station in Contra Costa County*. Copies available from the Northwest Information Center, Sonoma State University, Rohnert Park, Report Number S-35861.

Tang, “Tom” Bai, Michael Hogan, Josh Smallwood, and Terri Jacquemain

2005 *Historical Resources Compliance Report, Burlington Northern Santa Fe Railway Double Track Project (Segment 2), Oakley (MP 1146.1) to Port Chicago (MP 1164.4), In and Near the Cities of Oakley, Antioch, and Pittsburg, and the Port Chicago Naval Weapons Station, Contra Costa County, California*. Copies available from the Northwest Information Center, Sonoma State University, Rohnert Park, Report Number S-30387.

Theodoratus, Dorothy J., Mary Pyle Peters, Clinton M. Blount, Pamela J. McGuire, Richard D. Ambrose, Michael Christ, Billy J. Peck, and Myrna Saxe
1980 *Montezuma I and II Cultural Resources*. Copies available from the Northwest Information Center, Sonoma State University, Rohnert Park, Report Number S-11826.

West, G. James, and Patrick Welch
1996 *Class II Archaeological Survey of the Contra Costa Canal, Contra Costa County, California*. Copies available from the Northwest Information Center, Sonoma State University, Rohnert Park, Report Number S-18440.

Whitaker, Adrian
2010 *PG&E Contra-Costa to Moraga Reconductoring Project*. Copies available from the Northwest Information Center, Sonoma State University, Rohnert Park, Report Number S-38392.

Wohlgemuth, Eric
2005 *Archaeological Reconnaissance of the Pacific Gas and Electric Company 230 kV Delta Transmission Line Reconductoring Project, Solano, Sacramento, and Contra Costa Counties, California*. Copies available from the Northwest Information Center, Sonoma State University, Rohnert Park, Report Number S-34412.

APPENDICES

Appendix A NATIVE AMERICAN CONSULTATION DOCUMENTS

Native American Outreach Correspondence* Record for the City of Antioch AMPORTS Antioch Vehicle Processing Facility Project			
Contact & Affiliation	**Date of Contact**	**Method of Contact**	**Description**
NAHC	3/16/2021	Email	Stantec sent a description of the Project and the Project location and a Sacred Lands File Search and Native American Contacts List Request Form to the NAHC.
	3/25/2021	Email	The NAHC responded with negative search results and a list of sixteen (16) Native American organizations for further consultation.
Irene Zwierlein, Chairperson Amah Mutsun Tribal Band of Mission San Juan Bautista	4/8/2021	Certified Letter	The City of Antioch sent a certified letter to the address provided by the NAHC inviting the Tribe to consult on the Project. A Project description and location maps were included.
	4/8/2021	Email	The City sent a follow-up email to invite the Tribe to consult on the Project.
	5/5/2021	Telephone	Stantec called the number provided by the NAHC and left a detailed message in the Tribal voicemail box with Project information, a contact phone number, and a request for a comment.
	5/6/2021	Telephone	Stantec called the number provided by the NAHC and left a detailed message in the Tribal voicemail box with Project information, a contact phone number, and a request for a comment.
Lloyd Mathiesen, Chairperson Chicken Ranch Rancheria of Me-Wuk Indians	4/8/2021	Certified Letter	The City of Antioch sent a certified letter to the address provided by the NAHC inviting the Tribe to consult on the Project. A Project description and location maps were included.
	4/8/2021	Email	The City sent a follow-up email to invite the Tribe to consult on the Project.
	5/6/2021	Telephone	Stantec spoke with Mr. Mathiesen who stated that the Project is outside of the Tribe's territory. Me. Mathiesen suggested contacting other tribes, including the Ohlone and Coast Miwok.
Donald Duncan, Chairperson Guidiville Indian Rancheria	4/8/2021	Certified Letter	The City of Antioch sent a certified letter to the address provided by the NAHC inviting the Tribe to consult on the Project. A Project description and location maps were included.
	4/8/2021	Email	The City sent a follow-up email to invite the Tribe to consult on the Project.
	5/6/2021	Telephone	Stantec called the number provided by the NAHC and left a detailed message in the Tribal voicemail box with Project information, a contact phone number, and a request for a comment.
Ann Marie Sayers, Chairperson Indian Canyon Mutsun Band of Costanoan	4/8/2021	Certified Letter	The City of Antioch sent a certified letter to the address provided by the NAHC inviting the Tribe to consult on the Project. A Project description and location maps were included.
	4/8/2021	Email	The City sent a follow-up email to invite the Tribe to consult on the Project.
	4/10/2021	Email	Additional consultation with the Indian Canyon Mutsun Band of Costanoan was conducted by Kanyon Sayers-Roods and is described below.
Kanyon Sayers-Roods, MLD Indian Canyon Mutsun Band of Costanoan	4/8/2021	Certified Letter	The City of Antioch sent a certified letter to the address provided by the NAHC inviting the Tribe to consult on the Project. A Project description and location maps were included.
	4/8/2021	Email	The City sent a follow-up email to invite the Tribe to consult on the Project.
	4/10/2021	Email	Ms. Sayers-Roods contacted the City by email requesting additional information and identifying the Tribe's concerns regarding the sensitivity of the Project.
	4/14/2021	Email	City responded to Ms. Kanyon-Roods asking for additional details regarding potential resources in the

Native American Outreach Correspondence* Record for the City of Antioch AMPORTS Antioch Vehicle Processing Facility Project			
Contact & Affiliation	**Date of Contact**	**Method of Contact**	**Description**
			Project area and offered a meeting to discuss the Tribe's concerns.
	4/19	Email	Ms. Sayers-Roods responded asking for meeting
	4/28	Video Conference	City Planner Zoe Merideth, Stantec Archaeologist Leven Kraushaar, and Indian Canyon Mutsun Band of Costanoan Most Likely Descendent (MLD) Kanyon Sayers-Roods met by video and discussed Ms. Sayers-Roods' concerns with the Project, including the general sensitivity and importance of waterways and the natural environment to the Tribe.
	5/5	Email	The City sent a follow-up email with additional information requested during the meeting.
Monica Arellano, Vice Chairwoman Muwekma Ohlone Indian Tribe of the SF Bay Area	4/8/2021	Certified Letter	The City of Antioch sent a certified letter to the address provided by the NAHC inviting the Tribe to consult on the Project. A Project description and location maps were included.
	4/8/2021	Email	The City sent a follow-up email to invite the Tribe to consult on the Project.
	5/5/2021	Telephone	Stantec called the number provided by the NAHC. No voicemail was available.
	5/6/2021	Telephone	Stantec called the number provided by the NAHC. No voicemail was available.
Charlene Nijmeh, Chairperson Muwekma Ohlone Indian Tribe of the SF Bay Area	4/8/2021	Certified Letter	The City of Antioch sent a certified letter to the address provided by the NAHC inviting the Tribe to consult on the Project. A Project description and location maps were included.
	4/8/2021	Email	The City sent a follow-up email to invite the Tribe to consult on the Project.
	5/5/2021	Telephone	Stantec called the number provided by the NAHC. No voicemail was available.
Cosme Valdez, Chairperson Nashville Enterprise Miwok-Maidu-Nishinam Tribe	4/8/2021	Certified Letter	The City of Antioch sent a certified letter to the address provided by the NAHC inviting the Tribe to consult on the Project. A Project description and location maps were included.
	4/8/2021	Email	The City sent a follow-up email to invite the Tribe to consult on the Project.
	5/6/2021	Telephone	Stantec called the number provided by the NAHC and left a detailed message in the Tribal voicemail box with Project information, a contact phone number, and a request for a comment.
Katherine Perez, Chairperson North Valley Yokuts Tribe	4/8/2021	Certified Letter	The City of Antioch sent a certified letter to the address provided by the NAHC inviting the Tribe to consult on the Project. A Project description and location maps were included.
	4/8/2021	Email	The City sent a follow-up email to invite the Tribe to consult on the Project.
	5/6/2021	Telephone	Stantec called the number provided by the NAHC. No voicemail was available.
Timothy Perez North Valley Yokuts Tribe	4/8/2021	Certified Letter	The City of Antioch sent a certified letter to the address provided by the NAHC inviting the Tribe to consult on the Project. A Project description and location maps were included.
	4/8/2021	Email	The City sent a follow-up email to invite the Tribe to consult on the Project.
	5/6/2021	Telephone	Stantec called the number provided by the NAHC. No voicemail was available.
Andrew Galvan The Ohlone Indian Tribe	4/8/2021	Certified Letter	The City of Antioch sent a certified letter to the address provided by the NAHC inviting the Tribe to consult on the Project. A Project description and location maps were included.
	4/8/2021	Email	The City sent a follow-up email to invite the Tribe to consult on the Project. Mr. Galvan has previously

Native American Outreach Correspondence* Record for the City of Antioch AMPORTS Antioch Vehicle Processing Facility Project			
Contact & Affiliation	**Date of Contact**	**Method of Contact**	**Description**
			expressed that he prefers to be contacted by email rather than by phone.
Neil Peyron, Chairperson Tule River Indian Tribe	4/8/2021	Certified Letter	The City of Antioch sent a certified letter to the address provided by the NAHC inviting the Tribe to consult on the Project. A Project description and location maps were included.
	4/8/2021	Email	The City sent a follow-up email to invite the Tribe to consult on the Project.
	5/6/2021	Telephone	Stantec called the number provided by the NAHC and left a detailed message in the Tribal voicemail box with Project information, a contact phone number, and a request for a comment.
	5/6/2021	Telephone	Kerri Vera of the Tribal Environmental Office returned the call and stated that she would respond directly to the City by email.
	5/6/2021	Email	Ms. Vera requested information regarding resource identification efforts and results.
	5/10/2021	Email	The City responded with the additional information requested.
Dahlton Brown, Director of Administration Wilton Rancheria	4/8/2021	Certified Letter	The City of Antioch sent a certified letter to the address provided by the NAHC inviting the Tribe to consult on the Project. A Project description and location maps were included.
	4/8/2021	Email	The City sent a follow-up email to invite the Tribe to consult on the Project. Additional efforts were directed to Steven Hutchison.
Jesus Tarango, Chairperson Wilton Rancheria	4/8/2021	Certified Letter	The City of Antioch sent a certified letter to the address provided by the NAHC inviting the Tribe to consult on the Project. A Project description and location maps were included.
	4/8/2021	Email	The City sent a follow-up email to invite the Tribe to consult on the Project. Additional efforts were directed to Steven Hutchison.
Steven Hutchison, THPO Wilton Rancheria	4/8/2021	Certified Letter	The City of Antioch sent a certified letter to the address provided by the NAHC inviting the Tribe to consult on the Project. A Project description and location maps were included.
	4/8/2021	Email	The City sent a follow-up email to invite the Tribe to consult on the Project.
	5/6/2021	Telephone	Stantec called the number provided by the NAHC and left a detailed message in the Tribal voicemail box with Project information, a contact phone number, and a request for a comment.
Corrina Gould, Chairperson The Confederated Villages of Lisjan	4/8/2021	Certified Letter	The City of Antioch sent a certified letter to the address provided by the NAHC inviting the Tribe to consult on the Project. A Project description and location maps were included.
	4/8/2021	Email	The City sent a follow-up email to invite the Tribe to consult on the Project.
	5/6/2021	Telephone	Stantec called the number provided by the NAHC. Ms. Ms. Gould requested a digital copy of the original notification letter sent by the City.
	5/8/2021	Email	Stantec forwarded the digital letter, including a description of cultural resources identification efforts and results.
Sara Dutschke Setshwaelo, Chairwoman Ione Band of Miwok Indians	6/16/2021	Certified Letter	The City of Antioch sent a certified letter to the address provided by the NAHC inviting the Tribe to consult on the Project. A Project description and location maps were included.
	6/16/2021	Email	The City sent a follow-up email to invite the Tribe to consult on the Project.
	6/28/2021	Telephone	Stantec called the number provided by the NAHC and spoke with Tribal staff who recommended contacting

Native American Outreach Correspondence* Record for the City of Antioch AMPORTS Antioch Vehicle Processing Facility Project			
Contact & Affiliation	**Date of Contact**	**Method of Contact**	**Description**
			the Tribe's cultural committee. The Tribal office provided an email address for the cultural committee as the best way to contact members because there is currently no direct telephone contact.
	6/28/2021	Email	Stantec sent a digital copy of the notification letter to the cultural committee.

*Correspondence was conducted by Stantec Archaeologist Leven Kraushaar, MA.

Kraushaar, Leven

From: Fonseca, Sarah@NAHC <Sarah.Fonseca@nahc.ca.gov>
Sent: Thursday, March 25, 2021 9:54 AM
To: Kraushaar, Leven
Subject: Amports Antioch Vehicle Processing Facility in Antioch Project
Attachments: AB 52 No Amports Antioch Kraushaar CCosta 2021.03.25.pdf; Amports Antioch Kraushaar CCosta 2021.03.25.pdf

Good Morning,

Attached is the response to the project referenced above. If you have any additional questions, please feel free to contact our office email at nahc@nahc.ca.gov.

Stay Safe,

Sarah Fonseca

Cultural Resources Analyst

Native American Heritage Commission
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691

(916) 373-3714
Sarah.Fonseca@nahc.ca.gov

NATIVE AMERICAN HERITAGE COMMISSION

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

March 25, 2021

Leven Kraushaar, MA, Archaeologist
Stantec Consulting, Inc.

Via Email to: leven.kraushaar@stantec.com

Re: Native American Tribal Consultation, Pursuant to the Assembly Bill 52 (AB 52), Amendments to the California Environmental Quality Act (CEQA) (Chapter 532, Statutes of 2014), Public Resources Code Sections 5097.94 (m), 21073, 21074, 21080.3.1, 21080.3.2, 21082.3, 21083.09, 21084.2 and 21084.3, Amports Antioch Vehicle Processing Facility in Antioch Project, Contra Costa County

Dear Ms. Kraushaar:

Pursuant to Public Resources Code section 21080.3.1 (c), attached is a consultation list of tribes that are traditionally and culturally affiliated with the geographic area of the above-listed project. Please note that the intent of the AB 52 amendments to CEQA is to avoid and/or mitigate impacts to tribal cultural resources, (Pub. Resources Code §21084.3 (a)) ("Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource.")

Public Resources Code sections 21080.3.1 and 21084.3(c) require CEQA lead agencies to consult with California Native American tribes that have requested notice from such agencies of proposed projects in the geographic area that are traditionally and culturally affiliated with the tribes on projects for which a Notice of Preparation or Notice of Negative Declaration or Mitigated Negative Declaration has been filed on or after July 1, 2015. Specifically, Public Resources Code section 21080.3.1 (d) provides:

Within 14 days of determining that an application for a project is complete or a decision by a public agency to undertake a project, the lead agency shall provide formal notification to the designated contact of, or a tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, which shall be accomplished by means of at least one written notification that includes a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation pursuant to this section.

The AB 52 amendments to CEQA law does not preclude initiating consultation with the tribes that are culturally and traditionally affiliated within your jurisdiction prior to receiving requests for notification of projects in the tribe's areas of traditional and cultural affiliation. The Native American Heritage Commission (NAHC) recommends, but does not require, early consultation as a best practice to ensure that lead agencies receive sufficient information about cultural resources in a project area to avoid damaging effects to tribal cultural resources.

The NAHC also recommends, but does not require that agencies should also include with their notification letters, information regarding any cultural resources assessment that has been completed on the area of potential effect (APE), such as:

1. The results of any record search that may have been conducted at an Information Center of the California Historical Resources Information System (CHRIS), including, but not limited to:

- A listing of any and all known cultural resources that have already been recorded on or adjacent to the APE, such as known archaeological sites;
- Copies of any and all cultural resource records and study reports that may have been provided by the Information Center as part of the records search response;
- Whether the records search indicates a low, moderate, or high probability that unrecorded cultural resources are located in the APE; and
- If a survey is recommended by the Information Center to determine whether previously unrecorded cultural resources are present.

2. The results of any archaeological inventory survey that was conducted, including:

   - Any report that may contain site forms, site significance, and suggested mitigation measures.

     All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for public disclosure in accordance with Government Code section 6254.10.

3. The result of any Sacred Lands File (SLF) check conducted through the Native American Heritage Commission was negative.

4. Any ethnographic studies conducted for any area including all or part of the APE; and

5. Any geotechnical reports regarding all or part of the APE.

Lead agencies should be aware that records maintained by the NAHC and CHRIS are not exhaustive and a negative response to these searches does not preclude the existence of a tribal cultural resource. A tribe may be the only source of information regarding the existence of a tribal cultural resource.

This information will aid tribes in determining whether to request formal consultation. In the event that they do, having the information beforehand will help to facilitate the consultation process.

If you receive notification of change of addresses and phone numbers from tribes, please notify the NAHC. With your assistance, we can assure that our consultation list remains current.

If you have any questions, please contact me at my email address: Sarah.Fonseca@nahc.ca.gov.

Sincerely,

Sarah Fonseca
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Tribal Consultation List
Contra Costa County
3/25/2021

Amah MutsunTribal Band of Mission San Juan Bautista
Irene Zwierlein, Chairperson
789 Canada Road
Woodside, CA, 94062
Phone: (650) 851 - 7489
Fax: (650) 332-1526
amahmutsuntribal@gmail.com
Costanoan

Chicken Ranch Rancheria of Me-Wuk Indians
Lloyd Mathiesen, Chairperson
P.O. Box 1159
Jamestown, CA, 95327
Phone: (209) 984 - 9066
Fax: (209) 984-9269
lmathiesen@crtribal.com
Me-Wuk

Guidiville Indian Rancheria
Donald Duncan, Chairperson
P.O. Box 339
Talmage, CA, 95481
Phone: (707) 462 - 3682
Fax: (707) 462-9183
admin@guidiville.net
Pomo

Indian Canyon Mutsun Band of Costanoan
Ann Marie Sayers, Chairperson
P.O. Box 28
Hollister, CA, 95024
Phone: (831) 637 - 4238
ams@indiancanyon.org
Costanoan

Indian Canyon Mutsun Band of Costanoan
Kanyon Sayers-Roods, MLD Contact
1615 Pearson Court
San Jose, CA, 95122
Phone: (408) 673 - 0626
kanyon@kanyonkonsulting.com
Costanoan

Muwekma Ohlone Indian Tribe of the SF Bay Area
Monica Arellano, Vice Chairwoman
20885 Redwood Road, Suite 232
Castro Valley, CA, 94546
Phone: (408) 205 - 9714
marellano@muwekma.org
Costanoan

Muwekma Ohlone Indian Tribe of the SF Bay Area
Charlene Nijmeh, Chairperson
20885 Redwood Road, Suite 232
Castro Valley, CA, 94546
Phone: (408) 464 - 2892
cnijmeh@muwekma.org
Costanoan

Nashville Enterprise Miwok-Maidu-Nishinam Tribe
Cosme Valdez, Chairperson
P.O. Box 580986
Elk Grove, CA, 95758-0017
Phone: (916) 429 - 8047
Fax: (916) 429-8047
valdezcome@comcast.net
Miwok

North Valley Yokuts Tribe
Katherine Perez, Chairperson
P.O. Box 717
Linden, CA, 95236
Phone: (209) 887 - 3415
canutes@verizon.net
Costanoan
Northern Valley Yokut

North Valley Yokuts Tribe
Timothy Perez,
P.O. Box 717
Linden, CA, 95236
Phone: (209) 662 - 2788
huskanam@gmail.com
Costanoan
Northern Valley Yokut

The Ohlone Indian Tribe
Andrew Galvan,
P.O. Box 3388
Fremont, CA, 94539
Phone: (510) 882 - 0527
Fax: (510) 687-9393
chochenyo@AOL.com
Bay Miwok
Ohlone
Patwin
Plains Miwok

Tule River Indian Tribe
Neil Peyron, Chairperson
P.O. Box 589
Porterville, CA, 93258
Phone: (559) 781 - 4271
Fax: (559) 781-4610
neil.peyron@tulerivertribe-nsn.gov
Yokut

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and section 5097.98 of the Public Resources Code.

This list is only applicable for consultation with Native American tribes under Public Resources Code Sections 21080.3.1 for the proposed Amports Antioch Vehicle Processing Facility in Antioch Project, Contra Costa County.

Native American Heritage Commission
Tribal Consultation List
Contra Costa County
3/25/2021

Wilton Rancheria Dahlton Brown, Director of Administration 9728 Kent Street Elk Grove, CA, 95624 Phone: (916) 683 - 6000 dbrown@wiltonrancheria-nsn.gov	Miwok
Wilton Rancheria Jesus Tarango, Chairperson 9728 Kent Street Elk Grove, CA, 95624 Phone: (916) 683 - 6000 Fax: (916) 683-6015 jtarango@wiltonrancheria-nsn.gov	Miwok
Wilton Rancheria Steven Hutchason, THPO 9728 Kent Street Elk Grove, CA, 95624 Phone: (916) 683 - 6000 Fax: (916) 863-6015 shutchason@wiltonrancheria-nsn.gov	Miwok
The Confederated Villages of Lisjan Corrina Gould, Chairperson 10926 Edes Avenue Oakland, CA, 94603 Phone: (510) 575 - 8408 cvltribe@gmail.com	Bay Miwok Ohlone Delta Yokut

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and section 5097.98 of the Public Resources Code.

This list is only applicable for consultation with Native American tribes under Public Resources Code Sections 21080.3.1 for the proposed Amports Antioch Vehicle Processing Facility in Antioch Project, Contra Costa County.

ANTIOCH
CALIFORNIA

April 8, 2021

Monica Arellano
Muwekma Ohlone Indian Tribe of the SF Bay Area
20885 Redwood Road, Suite 232
Castro Valley, CA 94546

RE: Invitation to Request Consultation under Assembly Bill 52 for the City of Antioch AMPORTS Antioch Vehicle Processing Facility Project

Dear Ms. Arellano:

The City of Antioch (City) is preparing an Initial Study for the proposed AMPORTS Antioch Vehicle Processing Facility Project (Project). The proposed Project is on an approximately 38.9-acre site at 2301 Wilbur Avenue in the City of Antioch, California and is contained within two parcels, Assessor's Parcel Number (APN) 051-102-006 and APN 051-020-012. A Project location map is included as an attachment to this letter.

The applicant is proposing the development of an automotive logistics and processing facility to be used for the delivery and storage of vehicles and limited processing prior to distribution to dealerships. Proposed improvements include the conversion and upgrade of the existing wharf to support roll-on/roll-off (RORO) operation, the construction of a one-story vehicle processing building with offices, select demolition of existing raised slabs and out of service facilities, new utility connections, on-site stormwater improvements, and the installation of fencing, paving, and striping for car storage and loading. As the former site of the Gaylord Paper Mill, the proposed Project site is currently zoned for industrial use.

The Project is subject to the California Environmental Quality Act (CEQA), and the City is the lead agency. Per California Public Resources Code § 21080.3.1 (Assembly Bill [AB] 52 of 2014), the City is contacting you to conduct meaningful consultation with California Native American tribes that have requested notification by lead agencies of proposed projects in the geographic area with which the tribe is traditionally and culturally affiliated.

The input of your tribe is important to the City's planning process. Please respond in writing to this invitation to request consultation on or before May 21, 2021 if you wish you consult on the proposed Project. If you require any additional information or have any questions, please contact me at (925) 779-6122 or by e-mail at zmerideth@antiochca.gov. Thank you for your assistance.

Sincerely,

Zoe Merideth, Associate Planner
City of Antioch

Enclosure: Project Site Location

ANTIOCH
CALIFORNIA

April 8, 2021

Dahlton Brown
Wilton Rancheria
9728 Kent Street
Elk Grove, CA 95624

RE: Invitation to Request Consultation under Assembly Bill 52 for the City of Antioch AMPORTS Antioch Vehicle Processing Facility Project

Dear Mr. Brown:

The City of Antioch (City) is preparing an Initial Study for the proposed AMPORTS Antioch Vehicle Processing Facility Project (Project). The proposed Project is on an approximately 38.9-acre site at 2301 Wilbur Avenue in the City of Antioch, California and is contained within two parcels, Assessor's Parcel Number (APN) 051-102-006 and APN 051-020-012. A Project location map is included as an attachment to this letter.

The applicant is proposing the development of an automotive logistics and processing facility to be used for the delivery and storage of vehicles and limited processing prior to distribution to dealerships. Proposed improvements include the conversion and upgrade of the existing wharf to support roll-on/roll-off (RORO) operation, the construction of a one-story vehicle processing building with offices, select demolition of existing raised slabs and out of service facilities, new utility connections, on-site stormwater improvements, and the installation of fencing, paving, and striping for car storage and loading. As the former site of the Gaylord Paper Mill, the proposed Project site is currently zoned for industrial use.

The Project is subject to the California Environmental Quality Act (CEQA), and the City is the lead agency. Per California Public Resources Code § 21080.3.1 (Assembly Bill [AB] 52 of 2014), the City is contacting you to conduct meaningful consultation with California Native American tribes that have requested notification by lead agencies of proposed projects in the geographic area with which the tribe is traditionally and culturally affiliated.

The input of your tribe is important to the City's planning process. Please respond in writing to this invitation to request consultation on or before May 21, 2021 if you wish you consult on the proposed Project. If you require any additional information or have any questions, please contact me at (925) 779-6122 or by e-mail at zmerideth@antiochca.gov. Thank you for your assistance.

Sincerely,

Zoe Merideth, Associate Planner
City of Antioch

Enclosure: Project Site Location

ANTIOCH
CALIFORNIA

April 8, 2021

Donald Duncan
Guidiville Indian Rancheria
P.O. Box 339
Talmage, CA 95481

RE: Invitation to Request Consultation under Assembly Bill 52 for the City of Antioch AMPORTS Antioch Vehicle Processing Facility Project

Dear Mr. Duncan:

The City of Antioch (City) is preparing an Initial Study for the proposed AMPORTS Antioch Vehicle Processing Facility Project (Project). The proposed Project is on an approximately 38.9-acre site at 2301 Wilbur Avenue in the City of Antioch, California and is contained within two parcels, Assessor's Parcel Number (APN) 051-102-006 and APN 051-020-012. A Project location map is included as an attachment to this letter.

The applicant is proposing the development of an automotive logistics and processing facility to be used for the delivery and storage of vehicles and limited processing prior to distribution to dealerships. Proposed improvements include the conversion and upgrade of the existing wharf to support roll-on/roll-off (RORO) operation, the construction of a one-story vehicle processing building with offices, select demolition of existing raised slabs and out of service facilities, new utility connections, on-site stormwater improvements, and the installation of fencing, paving, and striping for car storage and loading. As the former site of the Gaylord Paper Mill, the proposed Project site is currently zoned for industrial use.

The Project is subject to the California Environmental Quality Act (CEQA), and the City is the lead agency. Per California Public Resources Code § 21080.3.1 (Assembly Bill [AB] 52 of 2014), the City is contacting you to conduct meaningful consultation with California Native American tribes that have requested notification by lead agencies of proposed projects in the geographic area with which the tribe is traditionally and culturally affiliated.

The input of your tribe is important to the City's planning process. Please respond in writing to this invitation to request consultation on or before May 21, 2021 if you wish you consult on the proposed Project. If you require any additional information or have any questions, please contact me at (925) 779-6122 or by e-mail at zmerideth@antiochca.gov. Thank you for your assistance.

Sincerely,

Zoe Merideth, Associate Planner
City of Antioch

Enclosure: Project Site Location

ANTIOCH
CALIFORNIA

April 8, 2021

Andrew Galvan
The Ohlone Indian Tribe
P.O. Box 3388
Fremont, CA 94539

RE: Invitation to Request Consultation under Assembly Bill 52 for the City of Antioch AMPORTS Antioch Vehicle Processing Facility Project

Dear Mr. Galvan:

The City of Antioch (City) is preparing an Initial Study for the proposed AMPORTS Antioch Vehicle Processing Facility Project (Project). The proposed Project is on an approximately 38.9-acre site at 2301 Wilbur Avenue in the City of Antioch, California and is contained within two parcels, Assessor's Parcel Number (APN) 051-102-006 and APN 051-020-012. A Project location map is included as an attachment to this letter.

The applicant is proposing the development of an automotive logistics and processing facility to be used for the delivery and storage of vehicles and limited processing prior to distribution to dealerships. Proposed improvements include the conversion and upgrade of the existing wharf to support roll-on/roll-off (RORO) operation, the construction of a one-story vehicle processing building with offices, select demolition of existing raised slabs and out of service facilities, new utility connections, on-site stormwater improvements, and the installation of fencing, paving, and striping for car storage and loading. As the former site of the Gaylord Paper Mill, the proposed Project site is currently zoned for industrial use.

The Project is subject to the California Environmental Quality Act (CEQA), and the City is the lead agency. Per California Public Resources Code § 21080.3.1 (Assembly Bill [AB] 52 of 2014), the City is contacting you to conduct meaningful consultation with California Native American tribes that have requested notification by lead agencies of proposed projects in the geographic area with which the tribe is traditionally and culturally affiliated.

The input of your tribe is important to the City's planning process. Please respond in writing to this invitation to request consultation on or before May 21, 2021 if you wish you consult on the proposed Project. If you require any additional information or have any questions, please contact me at (925) 779-6122 or by e-mail at zmerideth@antiochca.gov. Thank you for your assistance.

Sincerely,

Zoe Merideth

Zoe Merideth, Associate Planner
City of Antioch

Enclosure: Project Site Location

ANTIOCH
CALIFORNIA

April 8, 2021

Corrina Gould
The Confederated Villages of Lisjan
10926 Edes Avenue
Oakland, CA 94603

RE: Invitation to Request Consultation under Assembly Bill 52 for the City of Antioch AMPORTS Antioch Vehicle Processing Facility Project

Dear Ms. Gould:

The City of Antioch (City) is preparing an Initial Study for the proposed AMPORTS Antioch Vehicle Processing Facility Project (Project). The proposed Project is on an approximately 38.9-acre site at 2301 Wilbur Avenue in the City of Antioch, California and is contained within two parcels, Assessor's Parcel Number (APN) 051-102-006 and APN 051-020-012. A Project location map is included as an attachment to this letter.

The applicant is proposing the development of an automotive logistics and processing facility to be used for the delivery and storage of vehicles and limited processing prior to distribution to dealerships. Proposed improvements include the conversion and upgrade of the existing wharf to support roll-on/roll-off (RORO) operation, the construction of a one-story vehicle processing building with offices, select demolition of existing raised slabs and out of service facilities, new utility connections, on-site stormwater improvements, and the installation of fencing, paving, and striping for car storage and loading. As the former site of the Gaylord Paper Mill, the proposed Project site is currently zoned for industrial use.

The Project is subject to the California Environmental Quality Act (CEQA), and the City is the lead agency. Per California Public Resources Code § 21080.3.1 (Assembly Bill [AB] 52 of 2014), the City is contacting you to conduct meaningful consultation with California Native American tribes that have requested notification by lead agencies of proposed projects in the geographic area with which the tribe is traditionally and culturally affiliated.

The input of your tribe is important to the City's planning process. Please respond in writing to this invitation to request consultation on or before May 21, 2021 if you wish you consult on the proposed Project. If you require any additional information or have any questions, please contact me at (925) 779-6122 or by e-mail at zmerideth@antiochca.gov. Thank you for your assistance.

Sincerely,

Zoe Merideth, Associate Planner
City of Antioch

Enclosure: Project Site Location

April 8, 2021

Steven Hutchason
Wilton Rancheria
9728 Kent Street
Elk Grove, CA 95624

RE: Invitation to Request Consultation under Assembly Bill 52 for the City of Antioch AMPORTS Antioch Vehicle Processing Facility Project

Dear Mr. Hutchason:

The City of Antioch (City) is preparing an Initial Study for the proposed AMPORTS Antioch Vehicle Processing Facility Project (Project). The proposed Project is on an approximately 38.9-acre site at 2301 Wilbur Avenue in the City of Antioch, California and is contained within two parcels, Assessor's Parcel Number (APN) 051-102-006 and APN 051-020-012. A Project location map is included as an attachment to this letter.

The applicant is proposing the development of an automotive logistics and processing facility to be used for the delivery and storage of vehicles and limited processing prior to distribution to dealerships. Proposed improvements include the conversion and upgrade of the existing wharf to support roll-on/roll-off (RORO) operation, the construction of a one-story vehicle processing building with offices, select demolition of existing raised slabs and out of service facilities, new utility connections, on-site stormwater improvements, and the installation of fencing, paving, and striping for car storage and loading. As the former site of the Gaylord Paper Mill, the proposed Project site is currently zoned for industrial use.

The Project is subject to the California Environmental Quality Act (CEQA), and the City is the lead agency. Per California Public Resources Code § 21080.3.1 (Assembly Bill [AB] 52 of 2014), the City is contacting you to conduct meaningful consultation with California Native American tribes that have requested notification by lead agencies of proposed projects in the geographic area with which the tribe is traditionally and culturally affiliated.

The input of your tribe is important to the City's planning process. Please respond in writing to this invitation to request consultation on or before May 21, 2021 if you wish you consult on the proposed Project. If you require any additional information or have any questions, please contact me at (925) 779-6122 or by e-mail at zmerideth@antiochca.gov. Thank you for your assistance.

Sincerely,

Zoe Merideth, Associate Planner
City of Antioch

Enclosure: Project Site Location

April 8, 2021

Lloyd Mathiesen
Chicken Ranch Rancheria of Me-Wuk Indians
P.O. Box 1159
Jamestown, CA 95327

RE: Invitation to Request Consultation under Assembly Bill 52 for the City of Antioch AMPORTS Antioch Vehicle Processing Facility Project

Dear Mr. Mathiesen:

The City of Antioch (City) is preparing an Initial Study for the proposed AMPORTS Antioch Vehicle Processing Facility Project (Project). The proposed Project is on an approximately 38.9-acre site at 2301 Wilbur Avenue in the City of Antioch, California and is contained within two parcels, Assessor's Parcel Number (APN) 051-102-006 and APN 051-020-012. A Project location map is included as an attachment to this letter.

The applicant is proposing the development of an automotive logistics and processing facility to be used for the delivery and storage of vehicles and limited processing prior to distribution to dealerships. Proposed improvements include the conversion and upgrade of the existing wharf to support roll-on/roll-off (RORO) operation, the construction of a one-story vehicle processing building with offices, select demolition of existing raised slabs and out of service facilities, new utility connections, on-site stormwater improvements, and the installation of fencing, paving, and striping for car storage and loading. As the former site of the Gaylord Paper Mill, the proposed Project site is currently zoned for industrial use.

The Project is subject to the California Environmental Quality Act (CEQA), and the City is the lead agency. Per California Public Resources Code § 21080.3.1 (Assembly Bill [AB] 52 of 2014), the City is contacting you to conduct meaningful consultation with California Native American tribes that have requested notification by lead agencies of proposed projects in the geographic area with which the tribe is traditionally and culturally affiliated.

The input of your tribe is important to the City's planning process. Please respond in writing to this invitation to request consultation on or before May 21, 2021 if you wish you consult on the proposed Project. If you require any additional information or have any questions, please contact me at (925) 779-6122 or by e-mail at zmerideth@antiochca.gov. Thank you for your assistance.

Sincerely,

Zoe Merideth, Associate Planner
City of Antioch

Enclosure: Project Site Location

ANTIOCH
CALIFORNIA

April 8, 2021

Charlene Nijmeh
Muwekma Ohlone Indian Tribe of the SF Bay Area
20885 Redwood Road, Suite 232
Castro Valley, CA 94546

RE: Invitation to Request Consultation under Assembly Bill 52 for the City of Antioch AMPORTS Antioch Vehicle Processing Facility Project

Dear Ms. Nijmeh:

The City of Antioch (City) is preparing an Initial Study for the proposed AMPORTS Antioch Vehicle Processing Facility Project (Project). The proposed Project is on an approximately 38.9-acre site at 2301 Wilbur Avenue in the City of Antioch, California and is contained within two parcels, Assessor's Parcel Number (APN) 051-102-006 and APN 051-020-012. A Project location map is included as an attachment to this letter.

The applicant is proposing the development of an automotive logistics and processing facility to be used for the delivery and storage of vehicles and limited processing prior to distribution to dealerships. Proposed improvements include the conversion and upgrade of the existing wharf to support roll-on/roll-off (RORO) operation, the construction of a one-story vehicle processing building with offices, select demolition of existing raised slabs and out of service facilities, new utility connections, on-site stormwater improvements, and the installation of fencing, paving, and striping for car storage and loading. As the former site of the Gaylord Paper Mill, the proposed Project site is currently zoned for industrial use.

The Project is subject to the California Environmental Quality Act (CEQA), and the City is the lead agency. Per California Public Resources Code § 21080.3.1 (Assembly Bill [AB] 52 of 2014), the City is contacting you to conduct meaningful consultation with California Native American tribes that have requested notification by lead agencies of proposed projects in the geographic area with which the tribe is traditionally and culturally affiliated.

The input of your tribe is important to the City's planning process. Please respond in writing to this invitation to request consultation on or before May 21, 2021 if you wish you consult on the proposed Project. If you require any additional information or have any questions, please contact me at (925) 779-6122 or by e-mail at zmerideth@antiochca.gov. Thank you for your assistance.

Sincerely,

Zoe Merideth

Zoe Merideth, Associate Planner
City of Antioch

Enclosure: Project Site Location

ANTIOCH
CALIFORNIA

April 8, 2021

Katherine Perez
North Valley Yokuts Tribe
P.O. Box 717
Linden, CA 95236

RE: Invitation to Request Consultation under Assembly Bill 52 for the City of Antioch AMPORTS Antioch Vehicle Processing Facility Project

Dear Ms. Perez:

The City of Antioch (City) is preparing an Initial Study for the proposed AMPORTS Antioch Vehicle Processing Facility Project (Project). The proposed Project is on an approximately 38.9-acre site at 2301 Wilbur Avenue in the City of Antioch, California and is contained within two parcels, Assessor's Parcel Number (APN) 051-102-006 and APN 051-020-012. A Project location map is included as an attachment to this letter.

The applicant is proposing the development of an automotive logistics and processing facility to be used for the delivery and storage of vehicles and limited processing prior to distribution to dealerships. Proposed improvements include the conversion and upgrade of the existing wharf to support roll-on/roll-off (RORO) operation, the construction of a one-story vehicle processing building with offices, select demolition of existing raised slabs and out of service facilities, new utility connections, on-site stormwater improvements, and the installation of fencing, paving, and striping for car storage and loading. As the former site of the Gaylord Paper Mill, the proposed Project site is currently zoned for industrial use.

The Project is subject to the California Environmental Quality Act (CEQA), and the City is the lead agency. Per California Public Resources Code § 21080.3.1 (Assembly Bill [AB] 52 of 2014), the City is contacting you to conduct meaningful consultation with California Native American tribes that have requested notification by lead agencies of proposed projects in the geographic area with which the tribe is traditionally and culturally affiliated.

The input of your tribe is important to the City's planning process. Please respond in writing to this invitation to request consultation on or before May 21, 2021 if you wish you consult on the proposed Project. If you require any additional information or have any questions, please contact me at (925) 779-6122 or by e-mail at zmerideth@antiochca.gov. Thank you for your assistance.

Sincerely,

Zoe Merideth, Associate Planner
City of Antioch

Enclosure: Project Site Location

ANTIOCH
CALIFORNIA

April 8, 2021

Timothy Perez
North Valley Yokuts Tribe
P.O. Box 717
Linden, CA 95236

RE: Invitation to Request Consultation under Assembly Bill 52 for the City of Antioch AMPORTS Antioch Vehicle Processing Facility Project

Dear Mr. Perez:

The City of Antioch (City) is preparing an Initial Study for the proposed AMPORTS Antioch Vehicle Processing Facility Project (Project). The proposed Project is on an approximately 38.9-acre site at 2301 Wilbur Avenue in the City of Antioch, California and is contained within two parcels, Assessor's Parcel Number (APN) 051-102-006 and APN 051-020-012. A Project location map is included as an attachment to this letter.

The applicant is proposing the development of an automotive logistics and processing facility to be used for the delivery and storage of vehicles and limited processing prior to distribution to dealerships. Proposed improvements include the conversion and upgrade of the existing wharf to support roll-on/roll-off (RORO) operation, the construction of a one-story vehicle processing building with offices, select demolition of existing raised slabs and out of service facilities, new utility connections, on-site stormwater improvements, and the installation of fencing, paving, and striping for car storage and loading. As the former site of the Gaylord Paper Mill, the proposed Project site is currently zoned for industrial use.

The Project is subject to the California Environmental Quality Act (CEQA), and the City is the lead agency. Per California Public Resources Code § 21080.3.1 (Assembly Bill [AB] 52 of 2014), the City is contacting you to conduct meaningful consultation with California Native American tribes that have requested notification by lead agencies of proposed projects in the geographic area with which the tribe is traditionally and culturally affiliated.

The input of your tribe is important to the City's planning process. Please respond in writing to this invitation to request consultation on or before May 21, 2021 if you wish you consult on the proposed Project. If you require any additional information or have any questions, please contact me at (925) 779-6122 or by e-mail at zmerideth@antiochca.gov. Thank you for your assistance.

Sincerely,

Zoe Merideth, Associate Planner
City of Antioch

Enclosure: Project Site Location

ANTIOCH
CALIFORNIA

April 8, 2021

Neil Peyron
Tule River Indian Tribe
P.O. Box 589
Porterville, CA 93258

RE: Invitation to Request Consultation under Assembly Bill 52 for the City of Antioch AMPORTS Antioch Vehicle Processing Facility Project

Dear Mr. Peyron:

The City of Antioch (City) is preparing an Initial Study for the proposed AMPORTS Antioch Vehicle Processing Facility Project (Project). The proposed Project is on an approximately 38.9-acre site at 2301 Wilbur Avenue in the City of Antioch, California and is contained within two parcels, Assessor's Parcel Number (APN) 051-102-006 and APN 051-020-012. A Project location map is included as an attachment to this letter.

The applicant is proposing the development of an automotive logistics and processing facility to be used for the delivery and storage of vehicles and limited processing prior to distribution to dealerships. Proposed improvements include the conversion and upgrade of the existing wharf to support roll-on/roll-off (RORO) operation, the construction of a one-story vehicle processing building with offices, select demolition of existing raised slabs and out of service facilities, new utility connections, on-site stormwater improvements, and the installation of fencing, paving, and striping for car storage and loading. As the former site of the Gaylord Paper Mill, the proposed Project site is currently zoned for industrial use.

The Project is subject to the California Environmental Quality Act (CEQA), and the City is the lead agency. Per California Public Resources Code § 21080.3.1 (Assembly Bill [AB] 52 of 2014), the City is contacting you to conduct meaningful consultation with California Native American tribes that have requested notification by lead agencies of proposed projects in the geographic area with which the tribe is traditionally and culturally affiliated.

The input of your tribe is important to the City's planning process. Please respond in writing to this invitation to request consultation on or before May 21, 2021 if you wish you consult on the proposed Project. If you require any additional information or have any questions, please contact me at (925) 779-6122 or by e-mail at zmerideth@antiochca.gov. Thank you for your assistance.

Sincerely,

Zoe Merideth, Associate Planner
City of Antioch

Enclosure: Project Site Location

ANTIOCH
CALIFORNIA

April 8, 2021

Ann Marie Sayers
Indian Canyon Mutsun Band of Costanoan
P.O. Box 28
Hollister, CA 95024

RE: Invitation to Request Consultation under Assembly Bill 52 for the City of Antioch AMPORTS Antioch Vehicle Processing Facility Project

Dear Ms. Sayers:

The City of Antioch (City) is preparing an Initial Study for the proposed AMPORTS Antioch Vehicle Processing Facility Project (Project). The proposed Project is on an approximately 38.9-acre site at 2301 Wilbur Avenue in the City of Antioch, California and is contained within two parcels, Assessor's Parcel Number (APN) 051-102-006 and APN 051-020-012. A Project location map is included as an attachment to this letter.

The applicant is proposing the development of an automotive logistics and processing facility to be used for the delivery and storage of vehicles and limited processing prior to distribution to dealerships. Proposed improvements include the conversion and upgrade of the existing wharf to support roll-on/roll-off (RORO) operation, the construction of a one-story vehicle processing building with offices, select demolition of existing raised slabs and out of service facilities, new utility connections, on-site stormwater improvements, and the installation of fencing, paving, and striping for car storage and loading. As the former site of the Gaylord Paper Mill, the proposed Project site is currently zoned for industrial use.

The Project is subject to the California Environmental Quality Act (CEQA), and the City is the lead agency. Per California Public Resources Code § 21080.3.1 (Assembly Bill [AB] 52 of 2014), the City is contacting you to conduct meaningful consultation with California Native American tribes that have requested notification by lead agencies of proposed projects in the geographic area with which the tribe is traditionally and culturally affiliated.

The input of your tribe is important to the City's planning process. Please respond in writing to this invitation to request consultation on or before May 21, 2021 if you wish you consult on the proposed Project. If you require any additional information or have any questions, please contact me at (925) 779-6122 or by e-mail at zmerideth@antiochca.gov. Thank you for your assistance.

Sincerely,

Zoe Merideth, Associate Planner
City of Antioch

Enclosure: Project Site Location

ANTIOCH
CALIFORNIA

April 8, 2021

Kanyon Sayers-Roods
Indian Canyon Mutsun Band of Costanoan
1615 Pearson Court
San Jose, CA 95122

RE: Invitation to Request Consultation under Assembly Bill 52 for the City of Antioch AMPORTS Antioch Vehicle Processing Facility Project

Dear Ms. Sayers-Roods:

The City of Antioch (City) is preparing an Initial Study for the proposed AMPORTS Antioch Vehicle Processing Facility Project (Project). The proposed Project is on an approximately 38.9-acre site at 2301 Wilbur Avenue in the City of Antioch, California and is contained within two parcels, Assessor's Parcel Number (APN) 051-102-006 and APN 051-020-012. A Project location map is included as an attachment to this letter.

The applicant is proposing the development of an automotive logistics and processing facility to be used for the delivery and storage of vehicles and limited processing prior to distribution to dealerships. Proposed improvements include the conversion and upgrade of the existing wharf to support roll-on/roll-off (RORO) operation, the construction of a one-story vehicle processing building with offices, select demolition of existing raised slabs and out of service facilities, new utility connections, on-site stormwater improvements, and the installation of fencing, paving, and striping for car storage and loading. As the former site of the Gaylord Paper Mill, the proposed Project site is currently zoned for industrial use.

The Project is subject to the California Environmental Quality Act (CEQA), and the City is the lead agency. Per California Public Resources Code § 21080.3.1 (Assembly Bill [AB] 52 of 2014), the City is contacting you to conduct meaningful consultation with California Native American tribes that have requested notification by lead agencies of proposed projects in the geographic area with which the tribe is traditionally and culturally affiliated.

The input of your tribe is important to the City's planning process. Please respond in writing to this invitation to request consultation on or before May 21, 2021 if you wish you consult on the proposed Project. If you require any additional information or have any questions, please contact me at (925) 779-6122 or by e-mail at zmerideth@antiochca.gov. Thank you for your assistance.

Sincerely,

Zoe Merideth, Associate Planner
City of Antioch

Enclosure: Project Site Location

ANTIOCH
CALIFORNIA

April 8, 2021

Jesus Tarango
Wilton Rancheria
9728 Kent Street
Elk Grove, CA 95624

RE: Invitation to Request Consultation under Assembly Bill 52 for the City of Antioch AMPORTS Antioch Vehicle Processing Facility Project

Dear Mr. Tarango:

The City of Antioch (City) is preparing an Initial Study for the proposed AMPORTS Antioch Vehicle Processing Facility Project (Project). The proposed Project is on an approximately 38.9-acre site at 2301 Wilbur Avenue in the City of Antioch, California and is contained within two parcels, Assessor's Parcel Number (APN) 051-102-006 and APN 051-020-012. A Project location map is included as an attachment to this letter.

The applicant is proposing the development of an automotive logistics and processing facility to be used for the delivery and storage of vehicles and limited processing prior to distribution to dealerships. Proposed improvements include the conversion and upgrade of the existing wharf to support roll-on/roll-off (RORO) operation, the construction of a one-story vehicle processing building with offices, select demolition of existing raised slabs and out of service facilities, new utility connections, on-site stormwater improvements, and the installation of fencing, paving, and striping for car storage and loading. As the former site of the Gaylord Paper Mill, the proposed Project site is currently zoned for industrial use.

The Project is subject to the California Environmental Quality Act (CEQA), and the City is the lead agency. Per California Public Resources Code § 21080.3.1 (Assembly Bill [AB] 52 of 2014), the City is contacting you to conduct meaningful consultation with California Native American tribes that have requested notification by lead agencies of proposed projects in the geographic area with which the tribe is traditionally and culturally affiliated.

The input of your tribe is important to the City's planning process. Please respond in writing to this invitation to request consultation on or before May 21, 2021 if you wish you consult on the proposed Project. If you require any additional information or have any questions, please contact me at (925) 779-6122 or by e-mail at zmerideth@antiochca.gov. Thank you for your assistance.

Sincerely,

Zoe Merideth

Zoe Merideth, Associate Planner
City of Antioch

Enclosure: Project Site Location

ANTIOCH
CALIFORNIA

April 8, 2021

Cosme Valdez
Nashville Enterprise Miwok-Maidu-Nishinam
P.O. Box 580986
Elk Grove, CA 95758-0017

RE: Invitation to Request Consultation under Assembly Bill 52 for the City of Antioch AMPORTS Antioch Vehicle Processing Facility Project

Dear Mr. Valdez:

The City of Antioch (City) is preparing an Initial Study for the proposed AMPORTS Antioch Vehicle Processing Facility Project (Project). The proposed Project is on an approximately 38.9-acre site at 2301 Wilbur Avenue in the City of Antioch, California and is contained within two parcels, Assessor's Parcel Number (APN) 051-102-006 and APN 051-020-012. A Project location map is included as an attachment to this letter.

The applicant is proposing the development of an automotive logistics and processing facility to be used for the delivery and storage of vehicles and limited processing prior to distribution to dealerships. Proposed improvements include the conversion and upgrade of the existing wharf to support roll-on/roll-off (RORO) operation, the construction of a one-story vehicle processing building with offices, select demolition of existing raised slabs and out of service facilities, new utility connections, on-site stormwater improvements, and the installation of fencing, paving, and striping for car storage and loading. As the former site of the Gaylord Paper Mill, the proposed Project site is currently zoned for industrial use.

The Project is subject to the California Environmental Quality Act (CEQA), and the City is the lead agency. Per California Public Resources Code § 21080.3.1 (Assembly Bill [AB] 52 of 2014), the City is contacting you to conduct meaningful consultation with California Native American tribes that have requested notification by lead agencies of proposed projects in the geographic area with which the tribe is traditionally and culturally affiliated.

The input of your tribe is important to the City's planning process. Please respond in writing to this invitation to request consultation on or before May 21, 2021 if you wish you consult on the proposed Project. If you require any additional information or have any questions, please contact me at (925) 779-6122 or by e-mail at zmerideth@antiochca.gov. Thank you for your assistance.

Sincerely,

Zoe Merideth, Associate Planner
City of Antioch

Enclosure: Project Site Location

ANTIOCH
CALIFORNIA

April 8, 2021

Irene Zwierlein
Amah Mutsun Tribal Band of Mission San Juan Bautista
789 Canada Road
Woodside, CA 94062

RE: Invitation to Request Consultation under Assembly Bill 52 for the City of Antioch AMPORTS Antioch Vehicle Processing Facility Project

Dear Ms. Zwierlein:

The City of Antioch (City) is preparing an Initial Study for the proposed AMPORTS Antioch Vehicle Processing Facility Project (Project). The proposed Project is on an approximately 38.9-acre site at 2301 Wilbur Avenue in the City of Antioch, California and is contained within two parcels, Assessor's Parcel Number (APN) 051-102-006 and APN 051-020-012. A Project location map is included as an attachment to this letter.

The applicant is proposing the development of an automotive logistics and processing facility to be used for the delivery and storage of vehicles and limited processing prior to distribution to dealerships. Proposed improvements include the conversion and upgrade of the existing wharf to support roll-on/roll-off (RORO) operation, the construction of a one-story vehicle processing building with offices, select demolition of existing raised slabs and out of service facilities, new utility connections, on-site stormwater improvements, and the installation of fencing, paving, and striping for car storage and loading. As the former site of the Gaylord Paper Mill, the proposed Project site is currently zoned for industrial use.

The Project is subject to the California Environmental Quality Act (CEQA), and the City is the lead agency. Per California Public Resources Code § 21080.3.1 (Assembly Bill [AB] 52 of 2014), the City is contacting you to conduct meaningful consultation with California Native American tribes that have requested notification by lead agencies of proposed projects in the geographic area with which the tribe is traditionally and culturally affiliated.

The input of your tribe is important to the City's planning process. Please respond in writing to this invitation to request consultation on or before May 21, 2021 if you wish you consult on the proposed Project. If you require any additional information or have any questions, please contact me at (925) 779-6122 or by e-mail at zmerideth@antiochca.gov. Thank you for your assistance.

Sincerely,

Zoe Merideth, Associate Planner
City of Antioch

Enclosure: Project Site Location

From:	Kraushaar, Leven
To:	marellano@muwekma.org
Cc:	zmerideth@antiochca.gov
Subject:	Cultural Resources Information Request for the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California
Date:	Thursday, April 8, 2021 9:58:00 PM
Attachments:	let_arellano_ab52_antioch_amports_04_08_2021.pdf

Dear Honorable Chairperson Arellano,

On behalf of the City of Antioch, please find the attached letter regarding the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California. A hard copy of the letter was also mailed today (4/8/2021) as a certified letter through the U.S. Postal Service.

If you have questions, need additional information, or wish to comment, please feel free to contact me or Zoe Merideth with the City of Antioch. Our contact information is provided below.

Zoe Merideth, Associate Planner
City of Antioch
Email: zmerideth@antiochca.gov
Phone: (925) 779-6122

Leven Kraushaar, Archaeologist
Stantec Consulting Services, Inc.
Email: leven.kraushaar@stantec.com
Phone: (707) 318-8233

I will follow up on this email with a phone call in ten (10) business days. We sincerely request that you respond within 30 days of the receipt of this letter. Thank you in advance for your help with this, and I look forward to speaking with you.

Respectfully,
Leven Kraushaar

Leven Kraushaar MA
Archaeologist
Stantec
1383 North McDowell Blvd., Ste. 250
Petaluma, CA 94954
(707) 318-8233
leven.kraushaar@stantec.com

From:	Kraushaar, Leven
To:	huskanam@gmail.com
Cc:	zmerideth@antiochca.gov
Subject:	Cultural Resources Information Request for the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California
Date:	Thursday, April 8, 2021 10:03:00 PM
Attachments:	let_perez-2_ab52_antioch_amports_04_08_2021.pdf

Dear Mr. Perez,

On behalf of the City of Antioch, please find the attached letter regarding the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California. A hard copy of the letter was also mailed today (4/8/2021) as a certified letter through the U.S. Postal Service.

If you have questions, need additional information, or wish to comment, please feel free to contact me or Zoe Merideth with the City of Antioch. Our contact information is provided below.

Zoe Merideth, Associate Planner
City of Antioch
Email: zmerideth@antiochca.gov
Phone: (925) 779-6122

Leven Kraushaar, Archaeologist
Stantec Consulting Services, Inc.
Email: leven.kraushaar@stantec.com
Phone: (707) 318-8233

I will follow up on this email with a phone call in ten (10) business days. We sincerely request that you respond within 30 days of the receipt of this letter. Thank you in advance for your help with this, and I look forward to speaking with you.

Respectfully,
Leven Kraushaar

Leven Kraushaar MA
Archaeologist
Stantec
1383 North McDowell Blvd., Ste. 250
Petaluma, CA 94954
(707) 318-8233
leven.kraushaar@stantec.com

From:	Kraushaar, Leven
To:	lmathiesen@crtribal.com
Cc:	zmerideth@antiochca.gov
Subject:	Cultural Resources Information Request for the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California
Date:	Thursday, April 8, 2021 9:53:00 PM
Attachments:	let_mathiesen_ab52_antioch_amports_04_08_2021.pdf

Dear Honorable Chairperson Mathiesen,

On behalf of the City of Antioch, please find the attached letter regarding the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California. A hard copy of the letter was also mailed today (4/8/2021) as a certified letter through the U.S. Postal Service.

If you have questions, need additional information, or wish to comment, please feel free to contact me or Zoe Merideth with the City of Antioch. Our contact information is provided below.

Zoe Merideth, Associate Planner
City of Antioch
Email: zmerideth@antiochca.gov
Phone: (925) 779-6122

Leven Kraushaar, Archaeologist
Stantec Consulting Services, Inc.
Email: leven.kraushaar@stantec.com
Phone: (707) 318-8233

I will follow up on this email with a phone call in ten (10) business days. We sincerely request that you respond within 30 days of the receipt of this letter. Thank you in advance for your help with this, and I look forward to speaking with you.

Respectfully,
Leven Kraushaar

Leven Kraushaar MA
Archaeologist
Stantec
1383 North McDowell Blvd., Ste. 250
Petaluma, CA 94954
(707) 318-8233
leven.kraushaar@stantec.com

From:	Kraushaar, Leven
To:	admin@guidiville.net
Cc:	zmerideth@antiochca.gov
Subject:	Cultural Resources Information Request for the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California
Date:	Thursday, April 8, 2021 9:55:00 PM
Attachments:	let_duncan_ab52_antioch_amports_04_08_2021.pdf

Dear Honorable Chairperson Duncan,

On behalf of the City of Antioch, please find the attached letter regarding the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California. A hard copy of the letter was also mailed today (4/8/2021) as a certified letter through the U.S. Postal Service.

If you have questions, need additional information, or wish to comment, please feel free to contact me or Zoe Merideth with the City of Antioch. Our contact information is provided below.

Zoe Merideth, Associate Planner
City of Antioch
Email: zmerideth@antiochca.gov
Phone: (925) 779-6122

Leven Kraushaar, Archaeologist
Stantec Consulting Services, Inc.
Email: leven.kraushaar@stantec.com
Phone: (707) 318-8233

I will follow up on this email with a phone call in ten (10) business days. We sincerely request that you respond within 30 days of the receipt of this letter. Thank you in advance for your help with this, and I look forward to speaking with you.

Respectfully,
Leven Kraushaar

Leven Kraushaar MA
Archaeologist
Stantec
1383 North McDowell Blvd., Ste. 250
Petaluma, CA 94954
(707) 318-8233
leven.kraushaar@stantec.com

From:	Kraushaar, Leven
To:	canutes@verizon.net
Cc:	zmerideth@antiochca.gov
Subject:	Cultural Resources Information Request for the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California
Date:	Thursday, April 8, 2021 10:02:00 PM
Attachments:	let_perez_ab52_antioch_amports_04_08_2021.pdf

Dear Honorable Chairperson Perez,

On behalf of the City of Antioch, please find the attached letter regarding the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California. A hard copy of the letter was also mailed today (4/8/2021) as a certified letter through the U.S. Postal Service.

If you have questions, need additional information, or wish to comment, please feel free to contact me or Zoe Merideth with the City of Antioch. Our contact information is provided below.

Zoe Merideth, Associate Planner
City of Antioch
Email: zmerideth@antiochca.gov
Phone: (925) 779-6122

Leven Kraushaar, Archaeologist
Stantec Consulting Services, Inc.
Email: leven.kraushaar@stantec.com
Phone: (707) 318-8233

I will follow up on this email with a phone call in ten (10) business days. We sincerely request that you respond within 30 days of the receipt of this letter. Thank you in advance for your help with this, and I look forward to speaking with you.

Respectfully,
Leven Kraushaar

Leven Kraushaar MA
Archaeologist
Stantec
1383 North McDowell Blvd., Ste. 250
Petaluma, CA 94954
(707) 318-8233
leven.kraushaar@stantec.com

From:	Kraushaar, Leven
To:	valdezcome@comcast.net
Cc:	zmerideth@antiochca.gov
Subject:	Cultural Resources Information Request for the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California
Date:	Thursday, April 8, 2021 10:01:00 PM
Attachments:	let_valdez_ab52_antioch_amports_04_08_2021.pdf

Dear Honorable Chairperson Valdez,

On behalf of the City of Antioch, please find the attached letter regarding the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California. A hard copy of the letter was also mailed today (4/8/2021) as a certified letter through the U.S. Postal Service.

If you have questions, need additional information, or wish to comment, please feel free to contact me or Zoe Merideth with the City of Antioch. Our contact information is provided below.

Zoe Merideth, Associate Planner
City of Antioch
Email: zmerideth@antiochca.gov
Phone: (925) 779-6122

Leven Kraushaar, Archaeologist
Stantec Consulting Services, Inc.
Email: leven.kraushaar@stantec.com
Phone: (707) 318-8233

I will follow up on this email with a phone call in ten (10) business days. We sincerely request that you respond within 30 days of the receipt of this letter. Thank you in advance for your help with this, and I look forward to speaking with you.

Respectfully,
Leven Kraushaar

Leven Kraushaar MA
Archaeologist
Stantec
1383 North McDowell Blvd., Ste. 250
Petaluma, CA 94954
(707) 318-8233
leven.kraushaar@stantec.com

From:	Kraushaar, Leven
To:	cnijmeh@muwekma.org
Cc:	zmerideth@antiochca.gov
Subject:	Cultural Resources Information Request for the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California
Date:	Thursday, April 8, 2021 9:59:00 PM
Attachments:	let_nijmeh_ab52_antioch_amports_04_08_2021.pdf

Dear Honorable Chairperson Nijmeh,

On behalf of the City of Antioch, please find the attached letter regarding the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California. A hard copy of the letter was also mailed today (4/8/2021) as a certified letter through the U.S. Postal Service.

If you have questions, need additional information, or wish to comment, please feel free to contact me or Zoe Merideth with the City of Antioch. Our contact information is provided below.

Zoe Merideth, Associate Planner	Leven Kraushaar, Archaeologist
City of Antioch	Stantec Consulting Services, Inc.
Email: zmerideth@antiochca.gov	Email: leven.kraushaar@stantec.com
Phone: (925) 779-6122	Phone: (707) 318-8233

I will follow up on this email with a phone call in ten (10) business days. We sincerely request that you respond within 30 days of the receipt of this letter. Thank you in advance for your help with this, and I look forward to speaking with you.

Respectfully,
Leven Kraushaar

Leven Kraushaar MA
Archaeologist
Stantec
1383 North McDowell Blvd., Ste. 250
Petaluma, CA 94954
(707) 318-8233
leven.kraushaar@stantec.com

From:	Kraushaar, Leven
To:	kanyon@kanyonkonsulting.com
Cc:	zmerideth@antiochca.gov
Subject:	Cultural Resources Information Request for the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California
Date:	Thursday, April 8, 2021 9:57:00 PM
Attachments:	let_sayers-roods_ab52_antioch_amports_04_08_2021.pdf

Dear Ms. Sayers-Roods,

On behalf of the City of Antioch, please find the attached letter regarding the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California. A hard copy of the letter was also mailed today (4/8/2021) as a certified letter through the U.S. Postal Service.

If you have questions, need additional information, or wish to comment, please feel free to contact me or Zoe Merideth with the City of Antioch. Our contact information is provided below.

Zoe Merideth, Associate Planner	Leven Kraushaar, Archaeologist
City of Antioch	Stantec Consulting Services, Inc.
Email: zmerideth@antiochca.gov	Email: leven.kraushaar@stantec.com
Phone: (925) 779-6122	Phone: (707) 318-8233

I will follow up on this email with a phone call in ten (10) business days. We sincerely request that you respond within 30 days of the receipt of this letter. Thank you in advance for your help with this, and I look forward to speaking with you.

Respectfully,
Leven Kraushaar

Leven Kraushaar MA
Archaeologist
Stantec
1383 North McDowell Blvd., Ste. 250
Petaluma, CA 94954
(707) 318-8233
leven.kraushaar@stantec.com

From:	Kraushaar, Leven
To:	chochenyo@AOL.com
Cc:	zmerideth@antiochca.gov
Subject:	Cultural Resources Information Request for the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California
Date:	Thursday, April 8, 2021 10:05:00 PM
Attachments:	let_galvan_ab52_antioch_amports_04_08_2021.pdf

Dear Mr. Galvan,

On behalf of the City of Antioch, please find the attached letter regarding the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California. A hard copy of the letter was also mailed today (4/8/2021) as a certified letter through the U.S. Postal Service.

If you have questions, need additional information, or wish to comment, please feel free to contact me or Zoe Merideth with the City of Antioch. Our contact information is provided below.

Zoe Merideth, Associate Planner
City of Antioch
Email: zmerideth@antiochca.gov
Phone: (925) 779-6122

Leven Kraushaar, Archaeologist
Stantec Consulting Services, Inc.
Email: leven.kraushaar@stantec.com
Phone: (707) 318-8233

I will follow up on this email with a phone call in ten (10) business days. We sincerely request that you respond within 30 days of the receipt of this letter. Thank you in advance for your help with this, and I look forward to speaking with you.

Respectfully,
Leven Kraushaar

Leven Kraushaar MA
Archaeologist
Stantec
1383 North McDowell Blvd., Ste. 250
Petaluma, CA 94954
(707) 318-8233
leven.kraushaar@stantec.com

From: Kraushaar, Leven
To: neil.peyron@tulerivertribe-nsn.gov
Cc: zmerideth@antiochca.gov
Subject: Cultural Resources Information Request for the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California
Date: Thursday, April 8, 2021 10:06:00 PM
Attachments: let_peyron_ab52_antioch_amports_04_08_2021.pdf

Dear Honorable Chairperson Peyron,

On behalf of the City of Antioch, please find the attached letter regarding the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California. A hard copy of the letter was also mailed today (4/8/2021) as a certified letter through the U.S. Postal Service.

If you have questions, need additional information, or wish to comment, please feel free to contact me or Zoe Merideth with the City of Antioch. Our contact information is provided below.

Zoe Merideth, Associate Planner	Leven Kraushaar, Archaeologist
City of Antioch	Stantec Consulting Services, Inc.
Email: zmerideth@antiochca.gov	Email: leven.kraushaar@stantec.com
Phone: (925) 779-6122	Phone: (707) 318-8233

I will follow up on this email with a phone call in ten (10) business days. We sincerely request that you respond within 30 days of the receipt of this letter. Thank you in advance for your help with this, and I look forward to speaking with you.

Respectfully,
Leven Kraushaar

Leven Kraushaar MA
Archaeologist
Stantec
1383 North McDowell Blvd., Ste. 250
Petaluma, CA 94954
(707) 318-8233
leven.kraushaar@stantec.com

From:	Kraushaar, Leven
To:	dbrown@wiltonrancheria-nsn.gov
Cc:	zmerideth@antiochca.gov
Subject:	Cultural Resources Information Request for the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California
Date:	Thursday, April 8, 2021 10:08:00 PM
Attachments:	let_brown_ab52_antioch_amports_04_08_2021.pdf

Dear Director Brown,

On behalf of the City of Antioch, please find the attached letter regarding the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California. A hard copy of the letter was also mailed today (4/8/2021) as a certified letter through the U.S. Postal Service.

If you have questions, need additional information, or wish to comment, please feel free to contact me or Zoe Merideth with the City of Antioch. Our contact information is provided below.

Zoe Merideth, Associate Planner
City of Antioch
Email: zmerideth@antiochca.gov
Phone: (925) 779-6122

Leven Kraushaar, Archaeologist
Stantec Consulting Services, Inc.
Email: leven.kraushaar@stantec.com
Phone: (707) 318-8233

I will follow up on this email with a phone call in ten (10) business days. We sincerely request that you respond within 30 days of the receipt of this letter. Thank you in advance for your help with this, and I look forward to speaking with you.

Respectfully,
Leven Kraushaar

Leven Kraushaar MA
Archaeologist
Stantec
1383 North McDowell Blvd., Ste. 250
Petaluma, CA 94954
(707) 318-8233
leven.kraushaar@stantec.com

From:	Kraushaar, Leven
To:	jtarango@wiltonrancheria-nsn.gov
Cc:	zmerideth@antiochca.gov
Subject:	Cultural Resources Information Request for the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California
Date:	Thursday, April 8, 2021 10:10:00 PM
Attachments:	let_tarango_ab52_antioch_amports_04_08_2021.pdf

Dear Honorable Chairperson Tarango,

On behalf of the City of Antioch, please find the attached letter regarding the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California. A hard copy of the letter was also mailed today (4/8/2021) as a certified letter through the U.S. Postal Service.

If you have questions, need additional information, or wish to comment, please feel free to contact me or Zoe Merideth with the City of Antioch. Our contact information is provided below.

Zoe Merideth, Associate Planner	Leven Kraushaar, Archaeologist
City of Antioch	Stantec Consulting Services, Inc.
Email: zmerideth@antiochca.gov	Email: leven.kraushaar@stantec.com
Phone: (925) 779-6122	Phone: (707) 318-8233

I will follow up on this email with a phone call in ten (10) business days. We sincerely request that you respond within 30 days of the receipt of this letter. Thank you in advance for your help with this, and I look forward to speaking with you.

Respectfully,
Leven Kraushaar

Leven Kraushaar MA
Archaeologist
Stantec
1383 North McDowell Blvd., Ste. 250
Petaluma, CA 94954
(707) 318-8233
leven.kraushaar@stantec.com

From:	Kraushaar, Leven
To:	ams@indiancanyon.org
Cc:	zmerideth@antiochca.gov
Subject:	Cultural Resources Information Request for the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California
Date:	Thursday, April 8, 2021 9:56:00 PM
Attachments:	let_sayers_ab52_antioch_amports_04_08_2021.pdf

Dear Honorable Chairperson Sayers,

On behalf of the City of Antioch, please find the attached letter regarding the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California. A hard copy of the letter was also mailed today (4/8/2021) as a certified letter through the U.S. Postal Service.

If you have questions, need additional information, or wish to comment, please feel free to contact me or Zoe Merideth with the City of Antioch. Our contact information is provided below.

Zoe Merideth, Associate Planner
City of Antioch
Email: zmerideth@antiochca.gov
Phone: (925) 779-6122

Leven Kraushaar, Archaeologist
Stantec Consulting Services, Inc.
Email: leven.kraushaar@stantec.com
Phone: (707) 318-8233

I will follow up on this email with a phone call in ten (10) business days. We sincerely request that you respond within 30 days of the receipt of this letter. Thank you in advance for your help with this, and I look forward to speaking with you.

Respectfully,
Leven Kraushaar

Leven Kraushaar MA
Archaeologist
Stantec
1383 North McDowell Blvd., Ste. 250
Petaluma, CA 94954
(707) 318-8233
leven.kraushaar@stantec.com

From:	Kraushaar, Leven
To:	shutchason@wiltonrancheria-nsn.gov
Cc:	zmerideth@antiochca.gov
Subject:	Cultural Resources Information Request for the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California
Date:	Thursday, April 8, 2021 10:11:00 PM
Attachments:	let_hutchason_ab52_antioch_amports_04_08_2021.pdf

Dear Mr. Hutchason,

On behalf of the City of Antioch, please find the attached letter regarding the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California. A hard copy of the letter was also mailed today (4/8/2021) as a certified letter through the U.S. Postal Service.

If you have questions, need additional information, or wish to comment, please feel free to contact me or Zoe Merideth with the City of Antioch. Our contact information is provided below.

Zoe Merideth, Associate Planner	Leven Kraushaar, Archaeologist
City of Antioch	Stantec Consulting Services, Inc.
Email: zmerideth@antiochca.gov	Email: leven.kraushaar@stantec.com
Phone: (925) 779-6122	Phone: (707) 318-8233

I will follow up on this email with a phone call in ten (10) business days. We sincerely request that you respond within 30 days of the receipt of this letter. Thank you in advance for your help with this, and I look forward to speaking with you.

Respectfully,
Leven Kraushaar

Leven Kraushaar MA
Archaeologist
Stantec
1383 North McDowell Blvd., Ste. 250
Petaluma, CA 94954
(707) 318-8233
leven.kraushaar@stantec.com

From:	Kraushaar, Leven
To:	amahmutsuntribal@gmail.com
Cc:	zmerideth@antiochca.gov
Subject:	Cultural Resources Information Request for the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California
Date:	Thursday, April 8, 2021 10:14:00 PM
Attachments:	let_zwierlein_ab52_antioch_amports_04_08_2021.pdf

Dear Honorable Chairperson Zwierlein,

On behalf of the City of Antioch, please find the attached letter regarding the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California. A hard copy of the letter was also mailed today (4/8/2021) as a certified letter through the U.S. Postal Service.

If you have questions, need additional information, or wish to comment, please feel free to contact me or Zoe Merideth with the City of Antioch. Our contact information is provided below.

Zoe Merideth, Associate Planner	Leven Kraushaar, Archaeologist
City of Antioch	Stantec Consulting Services, Inc.
Email: zmerideth@antiochca.gov	Email: leven.kraushaar@stantec.com
Phone: (925) 779-6122	Phone: (707) 318-8233

I will follow up on this email with a phone call in ten (10) business days. We sincerely request that you respond within 30 days of the receipt of this letter. Thank you in advance for your help with this, and I look forward to speaking with you.

Respectfully,
Leven Kraushaar

Leven Kraushaar MA
Archaeologist
Stantec
1383 North McDowell Blvd., Ste. 250
Petaluma, CA 94954
(707) 318-8233
leven.kraushaar@stantec.com

From:	Kraushaar, Leven
To:	cvltribe@gmail.com
Cc:	zmerideth@antiochca.gov
Subject:	Cultural Resources Information Request for the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California
Date:	Thursday, April 8, 2021 10:12:00 PM
Attachments:	let_gould_ab52_antioch_amports_04_08_2021.pdf

Dear Honorable Chairperson Gould,

On behalf of the City of Antioch, please find the attached letter regarding the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California. A hard copy of the letter was also mailed today (4/8/2021) as a certified letter through the U.S. Postal Service.

If you have questions, need additional information, or wish to comment, please feel free to contact me or Zoe Merideth with the City of Antioch. Our contact information is provided below.

Zoe Merideth, Associate Planner
City of Antioch
Email: zmerideth@antiochca.gov
Phone: (925) 779-6122

Leven Kraushaar, Archaeologist
Stantec Consulting Services, Inc.
Email: leven.kraushaar@stantec.com
Phone: (707) 318-8233

I will follow up on this email with a phone call in ten (10) business days. We sincerely request that you respond within 30 days of the receipt of this letter. Thank you in advance for your help with this, and I look forward to speaking with you.

Respectfully,
Leven Kraushaar

Leven Kraushaar MA
Archaeologist
Stantec
1383 North McDowell Blvd., Ste. 250
Petaluma, CA 94954
(707) 318-8233
leven.kraushaar@stantec.com

Kraushaar, Leven

From: Merideth, Zoe <zmerideth@antiochca.gov>
Sent: Wednesday, May 5, 2021 2:03 PM
To: KKLLC Admin
Cc: Kraushaar, Leven
Subject: RE: AMPORTS Antioch Vehicle Processing Facility

Dear Ms. Sayers-Roods

Thank you again for meeting with the City to discuss Tribal and archaeological sensitivity for the AMPORTS Antioch Vehicle Processing Facility Project. As we discussed during the meeting, identification efforts to date have included a cultural resources records search for the entire project area and a surrounding radius of 0.5 mile, a Native American Heritage Commission Sacred Lands File search, and a formal historical evaluation of the wharf. In addition, we have consulted historic aerials and maps of the project and vicinity. No pedestrian archaeological survey has been performed because the project area is fully paved, which would prevent a visual inspection of the ground surface. Below is a list of key developments in the area:

- The wharf was originally built in 1956.
- The northern half of the property, including all of the property's shoreline, consists entirely of imported fill material used to extend the shoreline for wharf construction.
- A former paper mill, constructed the same year as the wharf, covered much of the southern portion of the property. The mill was operated until 1986, undergoing numerous modifications throughout that period.
- Portions of the property were repaved after 1993.
- The property was again modified and used for shipping until 2002.
- Industrial structures on the property were demolished between 2005 and 2009.
- The Gateway Generating Station east of the project underwent major modifications between 2010 and 2014.

A desktop geological sensitivity analysis indicates that the project area is underlain by unconsolidated Quaternary sand deposits. The nearest source of water is the San Joaquin River, which is immediately adjacent to the Project area. While these geological deposits are representative of a period of time when humans could have occupied the area, and fresh water resources were historically available, the highly dynamic nature of unconsolidated sands, the previously disturbed nature of soils at the site, and the presence of large amounts of imported fill material suggest an overall low sensitivity for buried cultural resources.

While the original wharf predates the State environmental process, other ground disturbing work listed above is recent enough to have been subject to environmental review. One prehistoric resource was identified during construction for these projects. This resource, consisting of five obsidian flakes observed on the surface and during trenching for an unrelated project, was recorded approximately 0.48 mile from the current project area. Project activities would not impact this site since it is well outside of the project area, and because the current project is located largely on imported fill and other highly disturbed soils, the sensitivity of the project area for buried cultural resources remains low despite the presence of this resource.

We believe, therefore, that cultural monitoring is unnecessary; however, to ensure that any potentially sensitive resources are protected, we have the following mitigation measures in the current draft of the project CEQA document:

> MM CUL-1: Workers Awareness Training. Prior to the start of any ground disturbing activities, a cultural resources awareness training shall be provided for all construction personnel involved in project implementation. The training shall be provided by a qualified cultural resources specialist and if they choose to participate, a representative of the Indian Canyon Band of Costanoan Ohlone People. The training program shall include relevant information regarding sensitive cultural resources and tribal cultural resources, including applicable regulations, protocols for avoidance, and consequences of violating State laws and regulations. The worker cultural resources awareness program shall also describe appropriate avoidance and minimization measures for resources that have the potential to be located on the project site, and shall outline what to do and whom to contact if any potential archaeological resources or artifacts are encountered. The program shall also underscore the requirement for confidentiality and culturally-appropriate treatment for any find of significance to Native

Americans and behavior consistent with Native American tribal values. A sign-in sheet shall be distributed to all participants of the training program and submitted to the City of Antioch within two weeks of program completion.

MM CUL-2: Cultural Materials Discovered During Construction. If any cultural resource is encountered during ground disturbance or subsurface construction activities (e.g., trenching, grading), all construction activities within a 50-foot radius of the identified potential resource shall cease until a Secretary of the Interior-qualified archaeologist evaluates the item for its significance and records the item on the appropriate State Department of Parks and Recreation 523 series forms. All forms and associated reports will be submitted to the NWIC of the CHRIS. The archaeologist shall determine whether the resource requires further study. If, after the qualified archaeologist conducts appropriate technical analyses, the resource is determined to be eligible for listing on the California Register of Historical Resources as a unique archaeological resource as defined in PRC Section 15064.5, the archaeologist shall develop a plan for the treatment of the resource. The plan shall contain appropriate mitigation measures, including avoidance, preservation in place, data recovery excavation, or other appropriate measures outlined in PRC Section 21083.2.

MM CUL-3: Human Burials Encountered During Construction. If ground-disturbing activities uncover previously unknown human remains, Section 7050.5 of the California Health and Safety Code applies, and the following procedures shall be followed: There shall be no further excavation or disturbance of the area where the human remains were found or within 50 feet of the find until the County Coroner and the appropriate City representative are contacted. Duly authorized representatives of the Coroner and the City shall be permitted onto the project area and shall take all actions consistent with Health and Safety Code Section 7050.5 and Government Code Sections 5097.98, et seq. Excavation or disturbance of the area where the human remains were found or within 50 feet of the find shall not be permitted to re-commence until the Coroner determines that the remains are not subject to the provisions of law concerning investigation of the circumstances, manner, and cause of any death. If the Coroner determines that the remains are Native American, the Coroner shall contact the NAHC within 24 hours, and the NAHC shall identify the person or persons it believes to be the most likely descendant (MLD) of the deceased Native American. The MLD may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in PRC Section 5097.98. If the MLD does not make recommendations within 48 hours, the landowner shall reinter the remains in an area of the property secure from further disturbance. If the landowner does not accept the MLD's recommendations, the owner or the MLD may request mediation by NAHC.

The City understands that the Tribe prefers an active, rather than reactive, response to cultural resources, and that if cultural resources are identified, rematriation and the creation of permanent cultural easements are the preferred management options. In addition to the direct impacts associated with the project, we understand that the Tribe is concerned with honoring Truth in History through land acknowledgement, educating the public with regards to the past, recognizing the importance of the natural world, and prioritizing ecological restoration. We also understand the intimate nature of the relationship that the Tribe has with the natural environment and historical waterways, and that this relationship extends far beyond discreet archaeological sites and burial locations. Access to the natural shoreline environment and the consideration of potential environmental impacts associated with industrial development are key aspects of maintaining this relationship.

In an effort to proactively address these concerns, the City is planning a comprehensive General Plan update in the near future and would like the Indian Canyon Band of Costanoan Ohlone People to participate in the General Plan process and public meetings. We think this would be a great way for the Indian Canyon Band of Costanoan Ohlone People to be involved in Citywide policy. As a first step, the City is adding the Indian Canyon Band of Costanoan Ohlone People to the mailing list for the project.

The current City Council appears committed to honoring Truth in History, as demonstrated by their recent response to attacks on the Asian American community (https://sanfrancisco.cbslocal.com/2021/04/14/antioch-establishing-chinatown-district-officials-apologize-for-citys-racist-history/). In terms of recognizing, protecting, and providing access to the natural environment, the Antioch Dunes National Wildlife Refuge is located near the project area. The refuge offers access to the shoreline and provides protected habitat for several native species. The City's General Plan also designates open space near the project site.

We value your assistance and look forward to working further with the Tribe.

Please let me know if you have any questions.

Thank you.

Respectfully,
Zoe Merideth

Zoe Merideth
Associate Planner

☎: 925-779-6159 (Main)
☎: 925-779-6122 (Direct)
💻: www.antiochca.gov

City of Antioch | P.O. Box 5007, Antioch, CA 94531-5007

ANTIOCH
CALIFORNIA
OPPORTUNITY LIVES HERE

From: KKLLC Admin <admin@kanyonkonsulting.com>
Sent: Tuesday, April 20, 2021 8:54 AM
To: Merideth, Zoe <zmerideth@antiochca.gov>
Subject: Re: AMPORTS Antioch Vehicle Processing Facility

Good Morning

Wed the 28th at 1pm would be perfect. If you could please set up that zoom link that would be great.
I look forward to speaking with you again

On Mon, Apr 19, 2021 at 4:09 PM Merideth, Zoe <zmerideth@antiochca.gov> wrote:

> Hello,
>
> Friday won't work for me. Are you free at any of these times to meet?
>
> Monday April 26th 1pm-4:30
>
> Tuesday April 27th 9am-12pm
>
> Wednesday April 28th 9am-12pm and 1pm-4:30
>
> I can set up a Zoom meeting like we did last week.
>
> Thank you,
>
> Zoe

Zoe Merideth

Associate Planner

☎: 925-779-6159 (Main)

☎: 925-779-6122 (Direct)
💻: www.antiochca.gov

City of Antioch | P.O. Box 5007, Antioch, CA 94531-5007

ANTIOCH
CALIFORNIA
OPPORTUNITY LIVES HERE

From: KKLLC Admin <admin@kanyonkonsulting.com>
Sent: Monday, April 19, 2021 7:56 AM
To: Merideth, Zoe <zmerideth@antiochca.gov>
Subject: Re: AMPORTS Antioch Vehicle Processing Facility

Good Morning Ms. Merideth,

I would appreciate the opportunity to speak with you regarding my concerns for this project area. Would Friday the 23rd at 9:30am for you?

On Wed, Apr 14, 2021 at 1:51 PM Merideth, Zoe <zmerideth@antiochca.gov> wrote:

> Dear Ms. Sayers-Roods,
>
> Thank you for sharing your concerns with the AMPORTS Antioch Vehicle Processing Facility Project in the email below. We appreciate the Indian Canyon Mutsun Band of Costanoan bringing this to the City's attention. While a record search and a search of the Native American Heritage Commission's Sacred Lands File did not identify any cultural resources in the project area, we understand that the Tribe has knowledge of resources that may not be recorded elsewhere and that may not be recognized during an archaeological survey.

I've attached two figures of the project site and a Google Earth KMZ of the project location. Can you please confirm if the cultural site you mention in your email is within the project area? If the cultural site is within the project area, we would need some additional information about the cultural site to make sure it is addressed properly in the CEQA analysis of impacts and would work with the Indian Canyon Mutsun Band of Costanoan to address any potential impacts to this resource.

If the cultural site is not within the project area but the Indian Canyon Mutsun Band of Costanoan have concerns that the project area may be sensitive for resources because it is near another cultural site, please let us know that as well so we can work with the Indian Canyon Mutsun Band of Costanoan on appropriate mitigation.

Thank you and we look forward to working with the Indian Canyon Mutsun Band of Costanoan.

Respectfully,

Zoe Merideth

Zoe Merideth

Associate Planner

☎: 925-779-6159 (Main)

☎: 925-779-6122 (Direct)
💻: www.antiochca.gov

City of Antioch | P.O. Box 5007, Antioch, CA 94531-5007

ANTIOCH
CALIFORNIA
OPPORTUNITY LIVES HERE

From: KKLLC Admin <admin@kanyonkonsulting.com>
Sent: Saturday, April 10, 2021 5:32 PM
To: leven.kraushaar@stantec.com; Merideth, Zoe <zmerideth@antiochca.gov>
Subject: AMPORTS Antioch Vehicle Processing Facility

To Whom it may concern,

My name is Kanyon Sayers-Roods. I am writing this on behalf of the Indian Canyon Band of Costanoan Ohlone People as requested, responding to your letter dated : April 8,2021

As this project's Area of Potential Effect (APE) overlaps or is near the management boundary of a recorded and potentially eligible cultural site, we recommend that a Native American Monitor and an Archaeologist be present on-site at all times. The presence of a monitor and archaeologist will help the project minimize potential effects on the cultural site and mitigate inadvertent issues.

Kanyon Konsulting, LLC has numerous Native Monitors available for projects such as this, if applicable, along with Cultural Sensitivity Training at the beginning of each project. This service is offered to aid those involved in the project to become more familiar with the indigenous history of the peoples of this land that is being worked on.

Kanyon Konsulting, LLC believes in having a strong proponent of honoring truth in history, when it comes to impacting cultural resources and potential ancestral remains. We have seen that projects like these tend to come into an area to consult/mitigate and move on shortly after. Doing so has the strong potential to impact cultural resources and disturb ancestral remains. Because of these possibilities, we highly recommend that you receive a specialized consultation provided by our company as the project commences.

As previously stated, our goal is to **Honor Truth in History**. And as such we want to ensure that there is an effort from the project organizer to take strategic steps in ways that **#HonorTruthinHistory**. This will make all involved aware of the history of the indigenous communities whom we acknowledge as the first stewards and land managers of these territories.

Potential Approaches to Ingenious Culture Awareness/History:
--Signs or messages to the audience or community of the territory being developed. (ex. A commerable plaque or as advantageous as an Educational/Cultural Center with information about the history of the land)

-- Commitment to consultation with the native peoples of the territory in regards to presenting messaging about the natives/Indigenous history of the land (Land Acknowledgement on website, written material about the space/org/building/business/etc)

-- Advocation of supporting indigenous lead movements and efforts. (informing one's audience and/or community about local present Indigenous community)

We look forward to working with you.
Best Regards,
Kanyon Sayers-Roods
Creative Director/Tribal Monitor
Kanyon Konsulting, LLC

Kraushaar, Leven

From:	Kraushaar, Leven
Sent:	Saturday, May 8, 2021 12:36 PM
To:	cvltribe@gmail.com
Cc:	'Merideth, Zoe'
Subject:	FW: Cultural Resources Information Request for the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California
Attachments:	let_gould_ab52_antioch_amports_04_08_2021.pdf

Dear Chairperson Gould,

Thank you for taking a moment to speak with me on the phone. As you requested, I am re-sending you the email with project information. A digital copy of the City's notification letter and project location map are attached.

Efforts to identify resources thus far have included a records search, Sacred Lands File search, formal historical evaluation of structures in the project area, and a literature review. No pedestrian survey was performed because the site is fully paved, preventing visual examination of the ground surface. No cultural resources were identified in the project area though these efforts.

We understand that the Tribe is aware of resources that may not be recorded elsewhere. If you are aware of any resources within the project area or have any concerns or questions or if you wish to comment on the project, please feel free to contact me or Zoe Merideth with the City of Antioch. Our contact information is below:

Zoe Merideth, Associate Planner
City of Antioch
Email: zmerideth@antiochca.gov
Phone: (925) 779-6122

Leven Kraushaar, Archaeologist
Stantec Consulting Services, Inc.
Email: leven.kraushaar@stantec.com
Phone: (707) 318-8233

Respectfully,
Leven Kraushaar

Leven Kraushaar MA
Archaeologist
Stantec
1383 North McDowell Blvd., Ste. 250
Petaluma, CA 94954
(707) 318-8233
leven.kraushaar@stantec.com

From: Kraushaar, Leven
Sent: Thursday, April 8, 2021 10:12 PM
To: cvltribe@gmail.com
Cc: zmerideth@antiochca.gov
Subject: Cultural Resources Information Request for the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California

Dear Honorable Chairperson Gould,

On behalf of the City of Antioch, please find the attached letter regarding the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California. A hard copy of the letter was also mailed today (4/8/2021) as a certified letter through the U.S. Postal Service.

If you have questions, need additional information, or wish to comment, please feel free to contact me or Zoe Merideth with the City of Antioch. Our contact information is provided below.

Zoe Merideth, Associate Planner
City of Antioch
Email: zmerideth@antiochca.gov
Phone: (925) 779-6122

Leven Kraushaar, Archaeologist
Stantec Consulting Services, Inc.
Email: leven.kraushaar@stantec.com
Phone: (707) 318-8233

I will follow up on this email with a phone call in ten (10) business days. We sincerely request that you respond within 30 days of the receipt of this letter. Thank you in advance for your help with this, and I look forward to speaking with you.

Respectfully,
Leven Kraushaar

Leven Kraushaar MA
Archaeologist
Stantec
1383 North McDowell Blvd., Ste. 250
Petaluma, CA 94954
(707) 318-8233
leven.kraushaar@stantec.com

Kraushaar, Leven

From: Merideth, Zoe <zmerideth@antiochca.gov>
Sent: Monday, May 10, 2021 8:13 AM
To: Kerri Vera
Cc: Kraushaar, Leven
Subject: RE: AMPORTS Antioch Vehicle Processing Facility Project

Dear Ms. Vera,

Thank you for responding to the City's outreach letter regarding the AMPORTS Antioch Vehicle Processing Facility Project with the email below. We appreciate the Tule River Tribe's input regarding the project.

Efforts to date have included a cultural resources records search for the entire project area and a surrounding radius of 0.5 mile, a Native American Heritage Commission Sacred Lands File search, and a formal historical evaluation of the wharf that is located within the project area. In addition, we have consulted historic aerials and maps of the project area and vicinity. No pedestrian archaeological survey has been performed because the project area is fully paved, which would prevent visual inspection of the ground surface.

No cultural resources were identified within the project area. If cultural sites or artifacts are discovered during project implementation, the City will reach out to the Native American community to work on appropriate mitigation. Thank you, and we look forward to working with the Tule River Tribe in the future.

Respectfully,
Zoe Merideth

Zoe Merideth
Associate Planner

☎: 925-779-6159 (Main)
☎: 925-779-6122 (Direct)
💻: www.antiochca.gov

City of Antioch | P.O. Box 5007, Antioch, CA 94531-5007

ANTIOCH
CALIFORNIA
OPPORTUNITY LIVES HERE

From: Kerri Vera <tuleriverenv@yahoo.com>
Sent: Thursday, May 6, 2021 3:40 PM
To: Merideth, Zoe <zmerideth@antiochca.gov>
Subject: AMPORTS Antioch Vehicle Processing Facility Project

Dear Ms. Merideth, thank you for the consultation letter for the above project, dated April 8th. At this time we do not have any information to share, regarding cultural sites or items within the proposed project area. Has there been any record searches or pedestrian surveys? If so, we would be interested in any positive findings.

If cultural sites or items are discovered during the process of this project, please reach out to us again.

Thank you,

Kerri Vera
Director
Department of Environmental Protection
Tule River Tribe

POB 589, Porterville CA 93257
ph(2): 559/783-9984
fax: 559/783-8932
email: tuleriverenv@yahoo.com

Ione Band of Miwok Indians
A Federally Recognized Sovereign Tribe

2 March 2016

Antioch
Community Development & Recreation Dept.
Tina Wehrmeister
200, Hst.
P.O. Box 5007
Antioch Ca.94531-5007

RE: Formal Request for Tribal Consultation Pursuant to the California Environmental Quality Act (CEQA), Public Resources Code section 21080.3.1, subds. (b), (d) and (e) for Antioch

Dear Ms. Wehrmeister,

This letter constitutes a formal request for tribal consultation for the first phase of planning under the provisions of the California Environmental Quality Act (CEQA) (Public Resources Code section 21080.3.1 subdivisions (b), (d) and (e)) for the mitigation of potential project impacts to tribal cultural and environmental resources for the above referenced project. The Ione Band of Miwok Indians requests formal notice and information for all projects within your agency's jurisdiction.

The Ione Band of Miwok Indians requests consultation on the following topics listed below, which shall be included in consultation if requested (Public Resources Code section 21080.3.2, subd. (a)):

- Alternatives to the project
- Recommended mitigation measures
- Significant effects of the project

The Ione Band of Miwok Indians also requests consultation on the following discretionary topics listed below (Public Resources Code section 21080.3.2, subd. (a)):

- Type of environmental review necessary
- Significance of tribal cultural resources, including any regulations, policies or standards used by your agency to determine significance of tribal cultural resources
- **Significance of the project's impacts on tribal cultural resources**
- Project alternatives and/or appropriate measures for preservation or mitigation that we may recommend, including, but not limited to:

(1) Avoidance and preservation of the resources in place, pursuant to Public Resources Code section 21084.3, including, but not limited to, planning and construction, geotechnical tests, utility location, and pedestrian surveys to avoid harming the resources (including water, endangered tribal plant resources, and endangered animal resources), and to protect the cultural and natural context, or planning greenspace, parks or other open space, to incorporate the resources with culturally appropriate protection and management criteria;

PO Box 699 9252 Bush Street • Plymouth • CA 95669 • Ph: 209-245-5800 • Fax 209-245-3112 www.ionemiwok.org

(2) Treating the resources with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resources, including but not limited to the following:

- Protecting the cultural character and integrity of the resource
- Protecting the traditional use of the resource
- Protecting the confidentiality of the resource

(3) Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places

(4) Protecting the resource

Additionally, the Ione Band of Miwok Indians would like to receive any cultural resources assessments or other **assessments that have been completed on all or part of the project's potential** "area of project effect" (APE), including, but not limited to:

1. The results of any record search that may have been conducted at an Information Center of the California Historical Resources Information System (CHRIS), including, but not limited to:

   - A listing of any and all known cultural resources that have already been recorded on or adjacent to the APE
   - Copies of any and all cultural resource records and study reports that may have been provided by the Information Center as part of the records search response
   - Notification of whether the probability is low, moderate, or high that cultural resources are located in the APE
   - Notification if a records search indicates a low, moderate or high probability that unrecorded cultural resources are located in the potential APE
   - Notification if a survey is recommended by the Information Center to determine whether previously unrecorded cultural resources are present

2. The results of any archaeological inventory survey that was conducted, including:

   - Any report that may contain site forms, site significance, and suggested mitigation measures
   - All information regarding site locations, Native American human remains, and associated funerary objects; such information should be placed in a separate confidential addendum, and not be made available for public disclosure in accordance with Government Code Section 6254.10.

3. The results of any Sacred Lands File (SFL) check conducted through the Native American Heritage Commission. The request form can be found at **http://www.dot.ca.gov/hq/env/cultural/#templates** under Compliance Document Templates. Click on the link *Sacred Lands Inventory Form* to download the pdf. USGS 7.5- minute quadrangle name, township, range, and section are required for the search.
4. Any ethnographic studies conducted for any area including all or part of the potential APE

5. Any geotechnical reports regarding all or part of the potential APE

We would like to remind your agency that CEQA Guidelines section 15126.4, subdivision (b)(3) states that preservation-in-place is the preferred manner of mitigating impacts to archaeological sites. Section 15126.4, subd. (b)(3) of the CEQA Guidelines has been **interpreted by the California Court of Appeal to mean that "feasible** preservation in place must be adopted to mitigate impacts to historical resources of an archaeological nature unless the lead agency determines that another form of mitigation is available and **provides superior mitigation of impacts.**" *Madera Oversight Coalition v. County of Madera* (2011) 199 Cal.App.4th 48, disapproved on other grounds, *Neighbors for Smart Rail v. Exposition Metro Line Construction Authority* (2013) 57 Cal.4th 439.

The Ione Band of Miwok Indians expects to begin consultation within 30 days of your receipt of this letter. Please contact the Cultural Committee of the Ione Band of Miwok Indians.

Thank you.

Sincerely,

Randy Yonemura

Randy Yonemura
Cultural Committee Chair
P.O. Box 699
9252 Bush St., Suite 2
Plymouth, CA 95669
Tel. (209) 245-5800
Email: Randy_yonemura@yahoo.com

IONE BAND OF MIWOK INDIANS INDIGENOUS TERRITORY

Kraushaar, Leven

From: Kraushaar, Leven
Sent: Wednesday, June 16, 2021 1:44 PM
To: sara@ionemiwok.net
Cc: Merideth, Zoe
Subject: Cultural Resources Information Request for the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California
Attachments: let_setshwaelo_ab52_antioch_amports_06_16_2021.pdf

Dear Chairperson Setshwaelo,

On behalf of the City of Antioch, please find the attached letter regarding the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California. A hard copy of the letter was also mailed today (6/16/2021) as a certified letter through the U.S. Postal Service.

If you have questions, need additional information, or wish to comment, please feel free to contact me or Zoe Merideth with the City of Antioch. Our contact information is provided below.

Zoe Merideth, Associate Planner
City of Antioch
Email: zmerideth@antiochca.gov
Phone: (925) 779-6122

Leven Kraushaar, Archaeologist
Stantec Consulting Services, Inc.
Email: leven.kraushaar@stantec.com
Phone: (707) 318-8233

I will follow up on this email with a phone call in ten (10) business days. We sincerely request that you respond within 30 days of the receipt of this letter. Thank you in advance for your help with this, and I look forward to speaking with you.

Respectfully,
Leven Kraushaar

Leven Kraushaar MA
Archaeologist
Stantec
1383 North McDowell Blvd., Ste. 250
Petaluma, CA 94954
(707) 318-8233
leven.kraushaar@stantec.com

Kraushaar, Leven

From:	Kraushaar, Leven
Sent:	Tuesday, June 29, 2021 11:09 AM
To:	culturalcommittee@ionemiwok.net
Subject:	Cultural Resources Information Request for the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California
Attachments:	let_setshwaelo_ab52_antioch_amports_06_16_2021.pdf

Good afternoon,

I've been trying to reach a representative of the Tribe or a tribal cultural resources specialist with whom to discuss the project referenced in the attached letter and in the email below. The tribal office has informed me that a phone number is not currently available. They referred me to this email.

Would it be possible to schedule a time to discuss the AMPORTS project by phone or video conference? The City of Antioch would greatly appreciate the Ione Band's input. Stantec is assisting the City in efforts to identify potential project impacts, but if you prefer to meet directly with the City planner, Zoe Merideth, I can also make those arrangements.

Our contact information is below. Please feel free to contact me at any time at (707) 318-8233 or Leven.Kraushaar@stantec.com. Thank you so much for your time.

Respectfully,
Leven

Leven Kraushaar MA
Archaeologist
Stantec
1383 North McDowell Blvd., Ste. 250
Petaluma, CA 94954
(707) 318-8233
leven.kraushaar@stantec.com

Dear Chairperson Setshwaelo,

On behalf of the City of Antioch, please find the attached letter regarding the AMPORTS Antioch Vehicle Processing Facility Project in Antioch, California. A hard copy of the letter was also mailed today (6/16/2021) as a certified letter through the U.S. Postal Service.

If you have questions, need additional information, or wish to comment, please feel free to contact me or Zoe Merideth with the City of Antioch. Our contact information is provided below.

Zoe Merideth, Associate Planner
City of Antioch
Email: zmerideth@antiochca.gov
Phone: (925) 779-6122

Leven Kraushaar, Archaeologist
Stantec Consulting Services, Inc.
Email: leven.kraushaar@stantec.com
Phone: (707) 318-8233

I will follow up on this email with a phone call in ten (10) business days. We sincerely request that you respond within 30 days of the receipt of this letter. Thank you in advance for your help with this, and I look forward to speaking with you.

Respectfully,
Leven Kraushaar

Leven Kraushaar MA

Archaeologist
Stantec
1383 North McDowell Blvd., Ste. 250
Petaluma, CA 94954
(707) 318-8233
leven.kraushaar@stantec.com

Appendix B TOM ORIGER AND ASSOCIATES ZELLERBACH WHARF EVALUATION REPORT

Historical Evaluation of the
Former Crown Zellerbach Wharf
Antioch, Contra Costa County, California

February 13, 2019

Historical Evaluation of the Former Crown Zellerbach Wharf Antioch, Contra Costa County, California

Prepared by:

Vicki R. Beard, M.A.

Tom Origer & Associates
Post Office Box 1531
Rohnert Park, California 94927
(707) 584-8200
(707) 584-8300 (fax)

Prepared for:

WRA, Inc
2169-G East Francisco Boulevard
San Rafael, California 94901

February 13, 2019

ABSTRACT

Tom Origer & Associates completed an historical evaluation of the former Crown Zellerbach Wharf in Antioch, Contra Costa County, California, as requested by Rachael Carnes of WRA, Inc. The former Crown Zellerbach/Gaylord Container property is under a long-term lease to AMPORTS, an automotive logistics and processing company. AMPORTS is considering upgrades and repairs to an existing wharf, including demolition of old wharf structures, removal of existing wooden piles, installation of new piles, timber repair, deck installation, and addition of new mechanical and lighting components.

Federal and state permits are needed for the project, requiring compliance with both Section 106 of the National Historic Preservation Act and Section 15064.5(a)(2)-(3) of the California Environmental Quality Act Guidelines. The purpose of this study was to assess the wharf's eligibility for the National Register of Historic Places or the California Inventory of Historical Resources using criteria set forth in 36CFR60 and Title 14 CCR, §4852, respectively.

During this study, primary and secondary records on file at various federal, state, and regional archives were searched, as were on-line databases such as the Online Archive of California, Calisphere, and Ancestry.com. In addition, existing documentation of the wharf and nearby properties was sought at the Northwest Information Center of California Historical Resources Information System. An on-site examination of the wharf was made in January 2019, and photographs were taken at that time.

This report presents information about the wharf's historic setting and context, a history and description of the wharf, and an assessment of its historical significance. In addition, Department of Parks and Recreation (DPR) forms were completed and are provided in Appendix A.

Synopsis

Project:	Historical Evaluation of the Crown Zellerbach Wharf
Location:	2301 Wilbur Avenue, Antioch, Contra Costa County, California
APN:	051-020-006
Quadrangle:	Antioch North, California 7.5' series
Study Type:	Historical evaluation
Scope:	Property specific
TOA #:	2018-121
Finds:	Not eligible for the National Register or California Register

Project Personnel

This report was prepared by Vicki R. Beard, who has been with Tom Origer & Associates since 1990. Ms. Beard holds a Master of Arts in cultural resources management with an emphasis in historical resources and meets the Secretary of the Interior's standards for archaeology, history, and architectural history. Graduate coursework and applied studies included building and structure evaluation, and historical research. Post-graduate work was completed in historical architecture through the Architecture Department at the University of California Berkeley; heritage resource management at the University of Nevada, Reno; and architectural history and historic landscapes through the National Preservation Institute, Alexandria, Virginia. Professional affiliations include the Society of Architectural Historians, Northern California Chapter of the Society of Architectural Historians, and Vernacular Architecture Forum. She is also listed on the Register of Professional Archaeologists.

Field and research assistance were provided by Amber Lion, who is currently pursuing an Associate of Art degree in Anthropology at Santa Rosa Junior College. Ms. Lion has eight years of experience conducting archaeological survey, excavation, and analysis in the Western United States, including California. She is affiliated with the Society for California Archaeology.

CONTENTS

FIGURES

TABLES

INTRODUCTION

Tom Origer & Associates completed an historical evaluation of the former Crown Zellerbach Wharf as requested by Rachael Carnes of WRA, Inc. The wharf is in the city of Antioch, on the south bank of the San Joaquin River, in northeastern Contra Costa County (Figure 1). Though now abandoned, it was once the shipping facility for the former Crown Zellerbach Paper Mill. The paper mill property is under a long-term lease to AMPORTS, an automotive logistics and processing company, which is considering upgrades and repairs to the existing wharf, including demolition of old wharf structures, removal of existing wooden piles, installation of new piles, timber repair, deck installation, and addition of new mechanical and lighting components.

Federal and state permits are needed for the project, requiring compliance with both Section 106 of the National Historic Preservation Act (Section 106) and Section 15064.5(a)(2)-(3) of the California Environmental Quality Act Guidelines (CEQA).

REGULATORY CONTEXT

Section 106 requires that a federal agency involved in an undertaking take into account the effects of the undertaking on historic properties (36CFR Part 800). To comply with Section 106, a federal agency must make an effort to identify historic properties by taking an inventory of resources that might be affected and gathering information to evaluate their eligibility for the National Register of Historic Places (National Register). An historic property is a building, structure, site, object, or district evaluated as historically significant. For purposes of the National Register, an historic property is evaluated in terms of criteria put forth in 36 CFR 60:

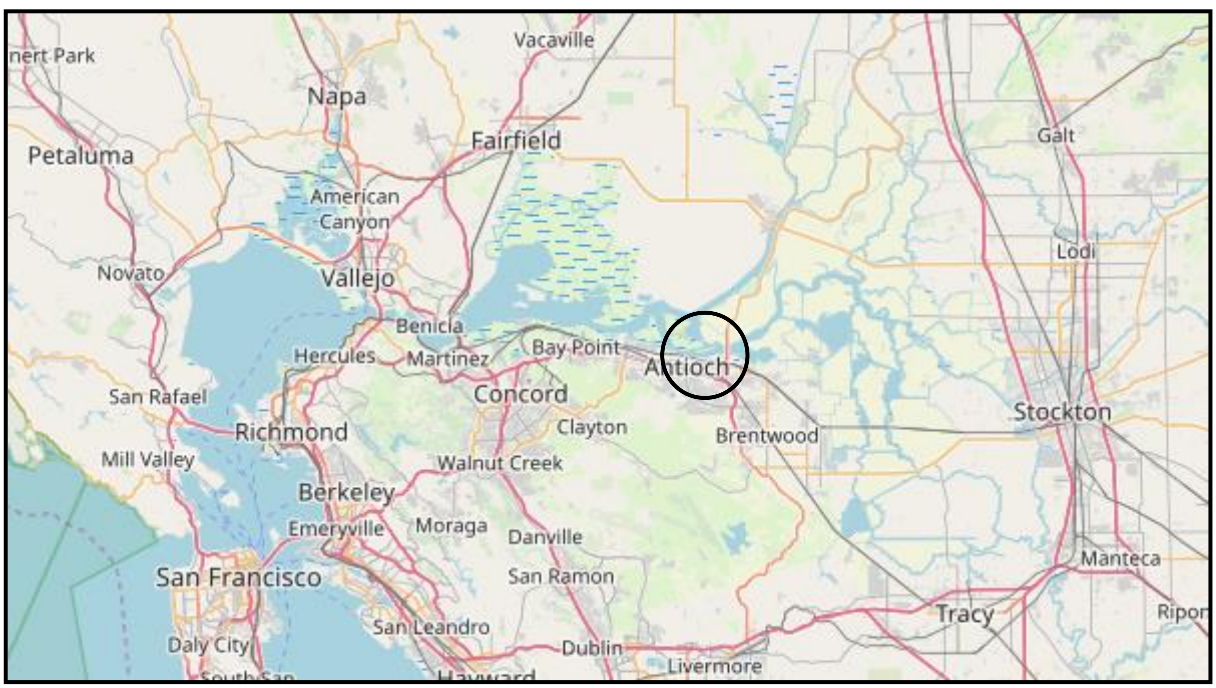


Figure 1. Project vicinity (© OpenStreetMap contributors)

The quality of significance is present in properties that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

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

B. That are associated with the lives of persons significant in our past; or

C. That embody the distinct characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. That have yielded or may be likely to yield, information important in prehistory or history.

Under CEQA, when a project might affect a cultural resource (i.e., site, building, structure, object, or district) the project proponent is required to conduct an assessment to determine whether the effect may be one that is significant. Consequently, it is necessary to determine the importance of resources that could be affected. The importance of a resource is measured in terms of criteria for inclusion on the California Register (Title 14 CCR, §4852) listed below. A resource may be important if it meets any one of the criteria below, or if it is already listed on the California Register or a local register of historical resources.

An important historical resource is one which:

1. Is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States.

2. Is associated with the lives of persons important to local, California, or national history.

3. Embodies the distinctive characteristics of a type, period, region or method of construction, or represents the work of a master, or possesses high artistic values.

4. Has yielded, or may be likely to yield, information important to the prehistory or history of the local area, California or the nation.

In addition to meeting one or more of the above criteria, eligibility for the California Register requires that a resource retains sufficient integrity to convey a sense of its significance or importance. Again, the seven elements considered key in assessing a property's integrity are location, design, setting, materials, workmanship, feeling, and association.

STUDY PROCEDURES

A search was made of primary and secondary sources to establish an historic context for the wharf. Records of the Contra Costa County Assessor's and Recorder's offices were searched via the online portal, Clerk-Recorder Imaging Information System (CRiis.com), and information at the Contra Costa County Library was accessed via their Remember & Go database (rememberandgo.ccclib.org). Crown Zellerbach Corporation records available at the Bancroft Library were searched, as were a variety of online databases such as Newspapers.com, Online Archive of California, Calisphere, and Ancestry.com.

Figure 2. Study location (adapted from the USGS 1978 North Antioch and 1980 South Antioch 7.5' maps).

Aerial photographs were obtained from the online collections of the University of California, Santa Barbara Library and the United States Geologic Survey. Additionally, documents, maps, and secondary sources at the offices of Tom Origer & Associates were reviewed.

A field examination was conducted on January 18, 2019, when photographs were taken of the wharf and its various elements. Descriptions are provided in the Property Description section of the report.

HISTORICAL SETTING

Antioch

The city of Antioch is situated at the western edge of the San Joaquin Delta near the confluence of the San Joaquin and Sacramento rivers. At one time, this area was part of the Rancho Los Meganos, a Mexican-era land grant made to Jose Noriega in 1835. In 1837, Noreiga sold the rancho to John Marsh, an American settler with a checkered past, who was one of the first American settlers in the area. Marsh established a small landing about a mile east of present-day Antioch for shipping cattle and grain. It was the first inland port in California (Jensen 2007). Later, a long pier was built to accommodate travelers to and from the gold fields and a store and warehouse were added (Figure 3).

After California came under United States (US) rule, Marsh filed a private land claim for 12 leagues of rancho land. After adjudication by the US District Court, the rancho was pared to just three leagues based on Noriego's original grant petition. Attorneys for Marsh, and later his daughter Alice, argued that the grant extended to the San Joaquin River; the court did not agree (General Land Office 1861; Hoffman 1862; West Publishing Company 1895). Much of the Marsh claim, including Marsh Landing, became public lands of the United States despite considerable development by Marsh and his assignees.

The roots of Antioch were set in 1849 when Marsh befriended newcomers William and Joseph Smith. Marsh "offered the Smiths ten acres of land each, advising them to embark in stock-raising" (Munro-Fraser 1882:482). Joseph Smith died in February 1850 leaving his brother to settle their 20 acre holdings. Later that year, William convinced other settlers to join him at Smiths Landing and soon after the name was changed to Antioch.

Antioch developed as a port town initially tied to resource extraction from the gold fields and the surrounding area, as well as locally grown grains and cattle. Its location on the San Joaquin River was ideal for shipping west to San Francisco and east to Sacramento and the gold fields. As historian Donald Pisani wrote, "California's mining industry contributed to the growth of ports and supply towns, which concentrated capital and furnished miners and former miners with jobs during the off-season" (Pisani 1991:23). Landings along the San Joaquin River prospered, and towns developed at intervals along the banks, but as the Gold Rush wound down during the 1860s the number of miners <u>decreased</u> by more than half - from a high of 83,000, as the number of farmers <u>increased</u> by more than half - to a high of 40,000 (Pisani 1991). Those not inclined toward agriculture sought other jobs in the port towns.

During the late 19th and early 20th centuries, Antioch drew several manufacturing concerns, again owing to its favorable location on a navigable waterway and also to the arrival of the Central Pacific Railroad in 1877. In 1895, civic boosters described Antioch as "the first natural gateway where the great San Joaquin Valley could meet the ships of the world with its produce," while citing a recent Coast and Geodetic survey showing from 26 to 50 feet of water from the Carquinez Strait to Antioch (*San Francisco Examiner* 1895*).*

Figure 3. Portions of Maps F-250 and F-251, US District Court Land Case 107 ND. Inset shows greater detail at Marsh Landing. Courtesy of the Bancroft Library.

By the end of the 19th century, Antioch was home to a wide array of manufacturers, including a distillery, mattress and upholstering company, paper mill, copper smelter, and brick maker.

Both brick and paper would be long term influences on the region surrounding Antioch. The *meganos,* or sand dunes, in the Antioch vicinity attracted several brick and pottery makers who built plants along the San Joaquin River. McMahon's 1908 map of Contra Costa County (Figure 4) shows parcels held by the Holland Sandstone Company, Golden Gate Brick, and S.F.G. Brick Company east of Antioch, including the area that would become the Zellerbach paper mill. In 1890, Marble D. Keeney and sons William, Collin, and Emerson opened the first paper mill in Antioch hoping to capitalize on locally produced wheat straw then used for making paper. The Keeneys were not new to the paper industry; Marble Keeney received a patent for a machine that made paper barrels in 1875 and would eventually hold several other paper-related patents. The mill changed hands over the years but continued to produce paper products well into the 20th century.

World War II had a major impact on the Bay Area's economy. In an article published in *Geographical Review* in 1957, Young and Griffin (1957:397) discuss the impact the war had on the area's manufacturing, asserting that "Aside from food processing, [pre-war] manufacturing consisted largely of assembling fabricated parts imported from the eastern United States, since there are practically no raw materials in the Bay Area." But, they continue, wartime demand brought heavy

Figure 4. Landholders in the Antioch vicinity, circa 1908 (McMahon 1908).

industry to the area, especially those industries related to metal and petroleum. Many of the new manufacturing enterprises located in Contra Costa County, around Richmond, Pittsburg, and Antioch. Between 1950 and 1955, DuPont and Crown Zellerbach invested nearly 27 million dollars in Antioch alone (Young and Griffin 1971:Table 1).

After the war, returning veterans swelled the state's population. Antioch grew by 46 percent between 1940 and 1950, and another 57 percent in the following decade, as shown in Table 1 (California State Data Center 2012). Housing and jobs were in high demand, and the area's established shipyards and other war-support industries – as they turned their focus to domestic products – were especially attractive employment opportunities.

Table 1. Antioch Population 1900 to 1960

Census Year	1900	1910	1920	1930	1940	1950	1960
Total	674	1,124	1,936	3,563	5,106	11,051	17,305
Percent increase[1]		68	72	84	43	116	57

[1] during previous decade
Source: California State Data Center

Crown Zellerbach

In 1870, Anthony Zellerbach established a retail stationary business in San Francisco, giving rise to what would become a world-wide corporation. Zellerbach and his son, Jacob took up paper manufacturing in 1882 under the name Zellerbach Paper Company. As more sons joined the company, the name changed again, this time to A. Zellerbach & Sons. It would be renamed the Zellerbach Paper Company in 1907, a name it kept until 1928, when after many years of strategic mergers, Zellerbach Paper Company joined with Crown Willamette Paper Company to become the Crown Zellerbach Corporation. Crown Zellerbach proved to be very successful with increased sales even through the depression years. During World War II, the company benefited as the influx of European pulp and paper ceased, leaving a void for Crown Zellerbach to fill. After the war, Crown Zellerbach added new products, built new mills, invested in improvements to its existing plants, and acquired companies throughout North America.

In 1954, Crown Zellerbach acquired the former Golden Gate Brick Company property between Wilbur Avenue and the San Joaquin River and announced their planned construction of a new paper mill (*San Francisco Examiner* 1954). They also entered into a lease agreement with the State Lands Commission in August 1955 for use of an 11.793-acre parcel of tide and submerged land in the San Joaquin River to construct an industrial dock. The lease would expire in 1970, with the option for Crown Zellerbach to renew in 10-year increments (California State Lands Commission 1971).

The new mill was constructed and began production in 1956. A second mill was constructed in 1957. Crown Zellerbach utilized the multi-stepped, kraft pulping process at the Antioch mill. First patented in 1884, kraft pulping used chemicals to break down wood chips and other fiber, allowing a wider range of raw sources to be used in producing stronger, more durable paper.

The wharf was completed on June 5, 1956 and caught fire 10 days later as welders were working near creosote piles (*Oakland Tribune* 1956). An estimated $150,000 in repairs was required to rebuild the wharf, which was to be an integral part of a plan to ship semi-dry pulp from the Crown Zellerbach plant in Canada to the mill in Antioch. Crown Zellebach contracted with National Bulk Carriers to design a specialty ship to carry semi-dry wood pulp (noodle pulp) from British Columbia to the mill in Antioch. Built at Kure Shipyard in Japan and christened the Duncan Bay, the pulp tanker was 587-foot long with an 84-foot beam. It was considered “a major contribution to a problem that is attaining significant importance in British Columbia’s pulp industry – the high cost of pulp transportation” (*The Log* 1956:41).

Apparently, the pulp shipping business was not cost effective and Crown Zellerbach scrapped the idea after a short time. In an interview with William J. Zellerbach and Stephen A. Zellerbach (1992:24), Willian spoke of the plan, “The ship would come down from Elk Falls to Antioch and discharge the pulp in a dry form, then water would be added and the mixture run over a paper machine. The whole thought was that they could save on transportation costs.” According to William, the *Duncan Bay* was leased to the company and when the lease was up “they said goodbye with great glee because it was a money loser.” In 1971, the ship was renamed the *Cedros Pacific* and in 1979 it was scrapped.

Crown Zellerbach operated the Antioch paper mill until 1986, and in the last 10 years produced only recycled paper. A hostile takeover by Sir James Goldsmith put an end to the paper-making giant (Hicks 1985). The Antioch mill became part of the Gaylord Container Corporation at that time. Operations continued under the Gaylord Container name until 2002.

HISTORIC CONTEXT

To evaluate the significance of a resource, it is necessary to understand historic patterns and themes that are important on national, state, and local levels. The significance of a historic property can be judged and explained only when it is evaluated within its historic context. Historic contexts are those patterns or trends in history by which a specific occurrence, property, or site is understood and its meaning (and ultimately its significance) within history or prehistory is made clear. The Crown Zellerbach wharf was evaluated within the context of Antioch’s Industrial Growth, 1850 to 1970.

Antioch and its environs were ideally situated for commercial and industrial success during and after Gold Rush. At first, its position on the San Joaquin River brought miners through the area and provided a port for shipping locally grown goods, especially wheat, to market. Later, with the advent of the Central Pacific Railroad and the Atchison, Topeka, and Santa Fe Railroad nearby, the Antioch area grew to be an important industrial center. Between 1850 and 1900, manufacturers focused primarily on resources that were close at hand; sand for brickmaking, tules for mattresses and upholstery, wheat hay for paper. New industries such as rolled steel and oil refining arrived during the early 1900s, and with World War II shipyards appeared. By the end of the war, heavy industry lined the banks of the San Francisco and Suisun bays and the San Joaquin River between Richmond and Antioch. As returning veterans settled in the area, these existing plants provided needed employment. Others such as Crown Zellerbach, Kaiser and Pacific Gas & Electric recognized the relative economy of locating their plants in eastern Contra Costa County further expanding growth in the Antioch area.

PROPERTY DESCRIPTION

The Crown Zellerbach wharf was constructed in 1956 based on a design by Earl and Wright, Consulting Engineers of San Francisco. After a fire destroyed part of the wharf, also in 1956, Earl and Wright drew the replacement plans (Earl and Wright 1955, 1956). The wharf is situated about 75 feet from, and parallel to, the shore. It is an L-shaped wharf with a concrete trestle at the east end that ties the wharf to the shore. There are also two narrow, wood trestles that allow access from the shore to a walkway beneath the wharf.

The original 751-foot wharf consisted of a 291 foot-long by 42 foot-wide central dock with flanking mooring docks. The current configuration stems from additions made in 1968 when Crown Zellebach engineers added 100 feet to the east end of the main dock and a narrow, 35-foot section to the west end. At that time, the walkway to the eastern mooring docks was reconfigured to facilitate a conveyor system to the shore. The conveyor ran the length of the wharf, depositing materials onto a lower conveyor at the east end where they continued to the shore. Figures 5 through 7 illustrate the wharf's evolution.

At present, the main structure consists of a flat, 410-foot long, concrete deck supported by vertical and battered timber piles. Some of the piles are now coated with shotcrete for fire resistance. Ten by ten-inch bullrails are along the edges. Three 16-pile breasting dolphins are on the seaward side of the wharf. These structures have 6 by 8-inch boards attached on the seaward side to serve as fenders. There is also a pivot dolphin off the northeast corner of the wharf. Mooring cleats and posts are found at intervals along the dock. A small, concrete block building sits on the south side of the wharf where trestle and wharf intersect. This building first appears on a 1971 aerial photograph. Beneath the concrete deck and running along the landward side of the wharf is a passageway accessing 36-inch pipes that pumped water to the paper mill.

The main deck has raised platforms at the west end atop a new section of the deck. Steel girders form the framework for this structure, and wood planks were used for flooring. At the east end, a steel girder and mesh platform extend beyond the edge of the upper deck, above a lower deck. These features were added in 1968. The platform holds the hopper for the conveyor system and vertical girders that extend above the hopper. Note, the conveyor system was removed prior to 1981. The vertical girders appear to have been used for hoisting materials. A set of metal steps lead to the lower deck, and a metal ramp provides access from the lower deck to the mooring dock.

The four mooring docks are constructed similarly though they have 10-inch concrete curbs rather than bullrails. Each of the four platforms measures 18.5 by 13 feet and has chamfered corners and a central mooring post. The fender system for the mooring docks and portions of the wharf consists of piles and 12-inch square timbers. The mooring docks connect to each other and to the main dock by narrow, wood plank walkways.

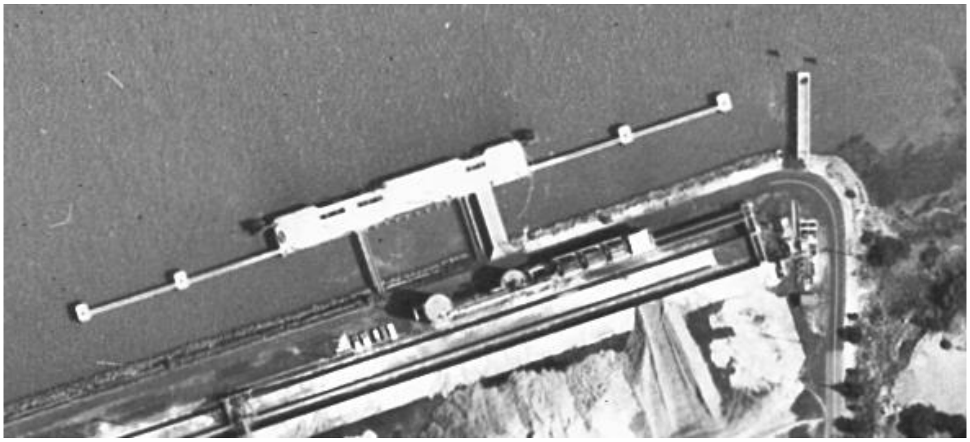


Figure 5. Aerial photographs of the wharf in 1965. Also shown is the onshore pulp receiving facility (courtesy of the Special Research Collections, UCSB Library, University of California Santa Barbara)

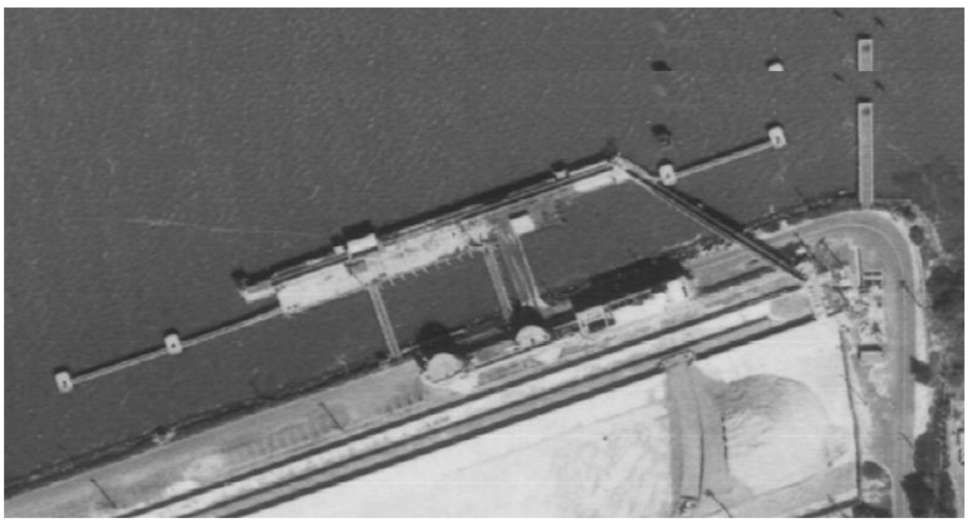


Figure 6. 1971 aerial photograph showing wharf modifications made in 1968. (courtesy of the Special Research Collections, UCSB Library, University of California Santa Barbara).

Figure 7. Aerial photograph taken in 2002 depicting the current wharf configuration (courtesy of the U.S. Geological Survey).

CONCLUSION

The purpose of this evaluation was to determine if the Crown Zellerbach wharf is eligible for inclusion on the National Register or California Register based on criteria provided in an earlier section of this report. Restated briefly, a cultural resource acquires significance from its association with an important event or pattern in history; through its association with an important person; because it represents a particular type, period, region or method of construction, the work of a master, or possesses high artistic values; or because it contains information that can be studied to enhance our understanding of history. The purpose of the historic context is to provide a framework for understanding and assessing the relative importance of an historic resource.

In addition to meeting one or more of the criteria, eligibility for the National Register and California Register requires that a resource retain sufficient integrity to convey a sense of its significance or importance. As defined by the State, "Integrity is the authenticity of an historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance" (California Office of Historic Preservation 2011:2). Seven elements are considered key in assessing a property's integrity: location, design, setting, materials, workmanship, feeling, and association.

Assessment of Significance

The following conclusions were reached with regard to each of the National Register and California Register eligibility criteria listed earlier in this report.

Criterion A/1

The former Crown Zellerbach wharf was constructed in 1956 to receive shipments for the company's new kraft paper mill. An explicit purpose for this wharf was to receive noodle pulp via a specialty tanker designed to carry semi-dry wood pulp. At the time, the pulp tanker was considered an innovative method to cut shipping costs though it did not prove to be cost effective after all. The mill made a significant contribution to the area's industrial growth but the wharf and a pumping station are all that remain of the paper mill. Those structures alone do not adequately convey the importance of the paper mill; Criterion A/1 is not met.

Criterion B/2

The wharf does not meet Criterion B/2. Under this criterion, a property can be significant because of its association with an important person or group of people. While the Antioch paper mill and adjacent wharf were part of the Crown Zellerbach empire, the mill has been demolished and the wharf alone does not adequately reflect the company's historical importance.

Criterion C/3

The wharf does not meet Criterion C/3. This criterion speaks to the architectural significance of a property. The wharf's architecture is not of special note, nor is the firm of Earl and Wright, Civil Engineers who designed the wharf.

Criterion D/4

Criterion D/4 generally applies to archaeological resources or resources that, through study of construction details, can provide information that cannot be obtained in other ways. This structure possesses no intrinsic qualities that could answer questions or provide important information about our history, and Criterion D/4 is not met.

Assessment of Integrity

With reference to the seven key elements of integrity, the Crown Zellerbach wharf retains excellent integrity of location, though integrity of design, setting, workmanship, and materials is diminished by changes to the wharf and its surroundings. The wharf was modified in 1965, adding to its length and changing its footprint. A new ramp and conveyer system were added and walkways were reconfigured. While those changes could, themselves, be old enough to be historically significant the conveyor system has been removed, and the setting changed drastically when the associated paper mill was demolished. For a resource to have integrity, most if not all of the elements of integrity should be present; the wharf lacks the integrity necessary for inclusion on the National or California Register.

SUMMARY AND RECOMMENDATIONS

An historical evaluation of the former Crown Zellerbach Wharf in Antioch was completed at the request of Rachael Carnes of WRA, Inc. The wharf was constructed for use by a new Crown Zellerbach (later Gaylord Container Corporation) paper mill constructed in 1956. The current lessee, AMPORTS, considering upgrades and repairs to the wharf, including demolition of old wharf structures, removal of existing wooden piles, installation of new piles, timber repair, deck installation, and addition of new mechanical and lighting components.

This evaluation was conducted pursuant to Section 106 and CEQA guidelines in anticipation of the need for federal and state permits. The wharf does not meet eligible criteria for inclusion in the National Register or California Register, and no further study is recommended.

MATERIALS CONSULTED

Antioch Historical Society, C. Bohakel, P. Hiebert, E. Rimbault, and C. Davis.
2005 *Antioch.* Arcadia Publishing, San Francisco.

Brick
1906 Pacific Coast Letter. *Brick*, Vol. 26, No. 6, pp. 304.

Cartwright Aerial Surveys
1965 Flight CAS_65_130, Frame 9-215. 1:12,000. 1 May 1965. Map & Imagery Laboratory, UC Santa Barbara Library.

1971 Flight CAS_71_3069, Frame 8-47. 1:12,000. 31 March 1971. Map & Imagery Laboratory, UC Santa Barbara Library.

1981 Flight CAS_81_81081, Frame 1-48. 1:12,000. 8 April 1981. Map & Imagery Laboratory, UC Santa Barbara Library.

California State Data Center
2012 Historical Census Populations of California, Counties, and Incorporated Cities, 1850-2010. California State Data Center, Demographic Research Unit, Department of Finance. <http://www.dof.ca.gov/Reports/Demographic_Reports/index.html#reports>

California State Lands Commission

1971 Amendment and 10-year Renewal of Lease PRC 1546.1, Tide and Submerged Land in San Joaquin River, Contra Costa County; Crown Zellerbach Corporation - W 8802, PRC 1546.I. http://archives.slc.ca.gov/Meeting_Summaries/1971_Documents/07-26-71/Items/72671C11.pdf

California State Mining Bureau

1906 The Structural and Industrial Materials of California. California State Mining Bureau. Bulletin 38.

California State Office of Historic Preservation

2011 *Technical Assistance Series #6: California Register and National Register: A Comparison.* California Office of Historic Preservation, Sacramento.

Center for Land Use Interpretation

2016 Slide Show: A Counter-Clockwise Loop Around the Shoreline of the San Francisco Bay Area. Slide 56_antioch_plant_site.jpg. <http://www.clui.org/page/a-counter-clockwise-loop-around-shoreline-san-francisco-bay-area>

Crown Zellerbach Corporation, Central Engineering

1968 Plans for the 1968 Dock Extensions and Details.

Earl and Wright, Consulting Engineers

1955 Plans for the Crown Zellerbach Wharf.

1956 Plans for the Crown Zellerbach Wharf Reconstruction.

Contra Costa County Community Development Department

2016 Revised Preliminary Historic Resources Inventory <http://ca-contracostacounty.civicplus.com/DocumentCenter/View/1116/Historic-Resources-Inventory-HRI?bidId=>

Craft, H.

1906 Making Sand-Lime Brick in California. *Brick*, Vol. 27, No. 3, pp. 98.

Fairchild Aerial Surveys

1939 Flight C_5750, Frame 279-102. 1:20,000. 1 Jan 1939. Map & Imagery Laboratory, UC Santa Barbara Library.

General Land Office

1866 Survey plat for Township 2 North, Range 2 East, Mount Diablo Base Meridian.

Hicks, J.

1985 Goldsmith Wins Control of Crown Zellerbach. *New York Times*, 26 July 1985.

Hoffman, O.

1862 *Reports of Land Cases Determined in the United States District Court for the Northern District of California: June Term, 1853, To June Term, 1858, Inclusive.* Sumner Whitney, San Francisco.

Jensen, C.
2007 *The California Delta*. Arcadia Publishing, San Francisco.

The Log
1956 Wood pulp can now become a tanker cargo. *The Log*, Vol. 51, No. 1, pp. 50-51.

McMahon, T. and W. Minto
1885 Official Map of Contra Costa County, California. <http://rememberandgo.ccclib.org/cdm/ref/collection/ maps/id/12>

McMahon, T.
1908 Official Map of Contra Costa County, California. <http://rememberandgo.ccclib.org/cdm/ref/collection/ maps/id/113>

Munro-Fraser, J.
1882 History of Contra Costa County, California. W. A. Slocum & Co., San Francisco

1926 History of Contra Costa County, California. Historic Record Company, Los Angeles.

Merchants Association of San Francisco
1910 *Handbook of Manufacturers in and about San Francisco*. Merchants Association of San Francisco

Mosier, D.
2018 California Bricks. <https://calbricks.netfirms.com/index.html>

National Park Service
1995 *How to Apply the National Register Criteria for Evaluation.* National Register Bulletin 15, Department of the Interior, Washington, D.C.

Oakland Tribune
1956 $150,000 Fire Hits Newly Completed Antioch Wharf. *Oakland Tribune*, 15 June 1956.

Office of Historic Preservation
1995 *Instructions for Recording Historic Resources*. Office of Historic Preservation, Sacramento.

Pacific Oil Reporter
1900 A. Zellerbach & Sons advertisement. *Pacific Oil Reporter,* March 23, 1900

Pisani, D.
1991 Land Monopoly in Nineteenth-Century California. *Agricultural History, Vol. 65, No.* 4, pg. 15-37. <http://www.jstor.org/stable/3743944>

Purcell, M.
1940 *History of Contra Costa County*. Gillick Press, Berkeley.

San Francisco Examiner
1895 Gateway to San Joaquin. *San Francisco Examiner,* 28 February 1895.
1954 Crown to build in Antioch. *San Francisco Examiner*, 11 November 1954.

Smith, D.
1970 *History of Papermaking in the United States, 1691-1969*. Lockwood Publishing, New York

United States. Congress and California Irrigation Commission
1873 Map of the San Joaquin, Sacramento And Tulare Valleys, State of California. Office of the Chief of Engineers U.S. Army, Washington, DC. <http://www.davidrumsey.com/maps1516.html>

United States. District Court. California, Northern District.
1853a Map of Los Meganos. Land case 107 ND, page 139; land case map F-250.

1853b Map of Los Meganos. Land case 107 ND, page 139; land case map F-251.

United States Geological Survey
2002 Delta Area, CA. Frame 1-40. 1:15,000. 23 May 2002. <https://earthexplorer.usgs.gov/>

Walker, R.
2004 Industry Builds Out the City: The Suburbanization of Manufacturing in the San Francisco Bay Area. In *Manufacturing Suburbs: Building Work and Home on the Metropolitan Fringe.* Edited by R. Lewis. Temple University Press, Philadelphia.

Weeks, L.
1916 *History of Paper Manufacturing in the United States, 1690-1916.* Burt Franklin, New York.

West Publishing Company
1894 Case No. 9120, Marsh vs United States. *The Federal Cases*. Vol. 16, pp. 820-821. West Publishing Company, St. Paul.

Young, R. and P. Griffin
1957 Recent Land-Use Changes in the San Francisco Bay Area. *Geographical Review*, Vol. 47, No. 3, pp. 396-405.

Zellerbach, W. and S. Zellerbach
1992 Recollections: Interviews with William J. Zellerbach and Stephen A. Zellerbach. Interviewed by G. Morris. Oral History Center, The Bancroft Library, University of California, Berkeley.

Appendix A:

Resource Documentation

PRIMARY RECORD

Primary # P-
HRI #
Trinomial:
NRHP Status Code:

Other Listings:
Review Code: **Reviewer:** **Date:**
Resource Name or #: Crown Zellerbach Wharf

P1. Other Identifier:

P2. Location: Unrestricted **a. County:** Contra Costa
b. USGS 7.5' Quad: Date: Antioch North 1978
T 2 **N/R** 2 **W**; NW **1/4 of** SE **1/4 of Sec.** 17; **MDBM**
c. Address: 2301 Wilbur Avenue **City:** Antioch **Zip:** 94509
d. UTM: Zone: 10 4208310 **mE** 607493 **mN** NAD84 (taken at southwest corner)
e. Other Locational Information: The pier is on the south side of the San Joaquin River, 0.3 miles north-northwest of the intersection of Viera Avenue and Wilbur Avenue in Antioch.

P3a. Description: The Crown Zellerbach wharf was constructed in 1956 based on a design by Earl and Wright, Consulting Engineers of San Francisco. After a fire destroyed part of the wharf, also in 1956, Earl and Wright drew the reconstruction plans (Earl and Wright 1955, 1956). The wharf is situated about 75 feet from, and parallel to, the shore. It is an L-shaped wharf with a concrete trestle at the east end that ties the wharf to the shore. There are also two narrow, wood trestles that allow access from the shore to a walkway beneath the wharf.

The original 751-foot wharf consisted of a 291 foot-long by 42 foot-wide central dock with flanking mooring docks. The current configuration stems from additions made in 1968 when Crown Zellebach engineers added 100 feet to the east end of the main dock and a narrow, 35-foot section to the west end. At that time, the walkway to the eastern mooring docks was reconfigured to facilitate a conveyor system to the shore. The conveyor ran the length of the wharf, depositing materials onto a lower conveyor at the east end where they continued to the shore. (Continued on Page 3)

P3b. Resource Attributes: AH13 (Wharf) **P4. Resources Present:** Structure

P5. Photograph or Drawing:/P5b. Description of Photo: Overview of the Crown Zellerbach/Gaylord Container site with wharf in foreground, (Center for Land Use Interpretation 2016).

P6. Date Constructed/Age and Sources:
1956

P7. Owner and Address:
2101-2603 Wilbur LLC
1515 Des Peres Rd #300
St. Louis Mo 63131-1846

P8. Recorded by:
V. Beard and A. Lion

P9. Date Recorded:
February 2019

P10. Type of Survey:
Resource specific

P11. Report Citation: Beard, 2019 Historical Evaluation of the Former Crown Zellerbach Wharf, Antioch, Contra Costa County, California.

P12. Attachments: Building, Structure, and Object Record, Continuation Sheets, Location Map.

B1. Historic Name: Crown Zellerbach Wharf

B2. Common Name: None known

B3. Original Use: Wharf

B4. Present Use: None

B5. Architectural Style: NA

B6. Construction History: The wharf was first constructed in 1956. The current configuration stems from additions made in 1968 when Crown Zellebach engineers added 100 feet to the east end and narrow, 35-foot section to the west end. At that time, the walkway to the eastern mooring docks was reconfigured to facilitate a conveyor system to the shore. The conveyor ran the length of the wharf, depositing materials onto a lower conveyor at the east end where they continued to the shore. By 1981, the conveyor system had been removed leaving only the hopper from the upper level of the wharf and two concrete piers along its route to shore.

B7. Moved? No **Date:** NA **Original Location:** NA

B8. Related Features: None

B9a. Architect: Earl and Wright, Consulting Engineers

B9b. Builder: Unknown

B10. Significance: Theme: Industrial Growth, 1850 to 1970 **Area:** Antioch
Period of Significance: NA
Property Type: Structure
Applicable Criteria: None

Context Statement

The Crown Zellerbach wharf was evaluated within the context of Antioch's Industrial Growth, 1850 to 1970. Antioch and its environs were ideally situated for commercial and industrial success during and after Gold Rush. At first, its position on the San Joaquin River brought miners through the area and provided a port for shipping locally grown goods, especially wheat, to market. Later, with the advent of the Central Pacific Railroad and the Atchison, Topeka, and Santa Fe Railroad nearby, the Antioch area grew to be an important industrial center. Between 1850 and 1900, manufacturers focused primarily on resources that were close at hand; sand for brickmaking, tules for mattresses and upholstery, wheat hay for paper. New industries such as rolled steel and oil refining arrived during the early 1900s, and with World War II shipyards appeared. By the end of the war, heavy industry lined the banks of the San Francisco and Suisun bays and the San Joaquin River between Richmond and Antioch. As returning veterans settled in the area, these existing plants provided needed employment. Others such as Crown Zellerbach, Kaiser and Pacific Gas & Electric recognized the relative economy of locating their plants in eastern Contra Costa County further expanding growth in the Antioch area.

(Continued on page 4)

B11. Additional Resource Attributes:
NA

B12. References:
See Continuation Sheet, page 6

B13. Remarks:

B14. Evaluator: V. Beard
Date of Evaluation: February 2019

P3a. Description: (Continued from page 1)

The main structure consists of a flat, concrete deck supported by vertical and battered timber piles. Some of the piles are now coated with shotcrete for fire resistance. Ten by ten inch bullrails are along the edges. Three 16-pile breasting dolphins are on the seaward side of the wharf. These structures have 6 by 8-inch boards attached on the seaward side to serve as fenders. There is also a pivot dolphin off the northeast corner of the wharf. Mooring cleats and posts are found at intervals along the dock. A small, concrete block building sits on the south side of the wharf where trestle and wharf intersect. This building first appears on a 1971 aerial photograph. Beneath the concrete deck and running along the landward side of the wharf is a passageway accessing 36-inch pipes that pumped water to the paper mill.

The main deck has raised platforms at the west end atop a new section of the deck. Steel girders form the frame work for this structure, and wood planks were used for flooring. At the east end, a steel girder and mesh platform extend beyond the edge of the upper deck, above a lower deck. These features were added in 1968. The platform holds the hopper for the conveyor system and vertical girders that extend above the hopper. The vertical girders appear to have been used for hoisting materials. A set of metal steps lead to the lower deck, and a metal ramp provides access from the lower deck to the mooring dock.

The four mooring docks are constructed similarly though they have 10-inch concrete curbs rather than bullrails. Each of the four platforms measures 18.5 by 13 feet and has chamfered corners and a central mooring post. The fender system for the mooring docks and portions of the wharf consists of piles and 12-inch square timbers. The mooring docks connect to each other and to the main dock by narrow walkways.

Figure 1. Aerial photograph of the Crown Zellerbach plant in 1965.

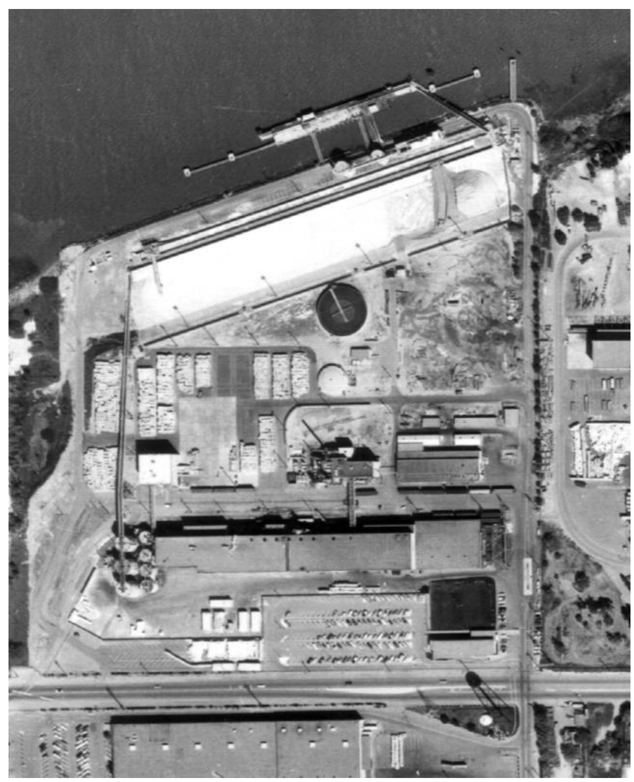


Figure 2. Aerial photograph showing the plant in 1971. Note changes to the pier and the new conveyor system.

B10. Significance: (Continued from page 2)

Property History
In 1954, Crown Zellerbach acquired the former Golden Gate Brick Company property between Wilbur Avenue and the San Joaquin River and announced their planned construction of a new paper mill (*San Francisco Examiner* 1954). They also entered into a lease agreement with the State Lands Commission in August 1955 for use of an 11.793-acre parcel of tide and submerged land in the San Joaquin River to construct an industrial dock. The lease would expire in 1970, with the option for Crown Zellerbach to renew in 10-year increments (California State Lands Commission 1971).

The new mill was constructed and began production in 1956. A second mill was constructed in 1957. Crown Zellerbach utilized the multi-stepped, kraft pulping process at the Antioch mill. First patented in 1884, kraft pulping used chemicals to break down wood chips and other fiber, allowing a wider range of raw sources to be used in producing stronger, more durable paper.

The wharf was completed on June 5, 1956, and caught fire 10 days later as welders were working near creosote piles (*Oakland Tribune* 1956). An estimated $150,000 in repairs was required to rebuild the wharf, which was to be an integral part of a plan to ship semi-dry pulp from the Crown Zellerbach plant in Canada to the mill in Antioch. Crown Zellebach contracted with National Bulk Carriers to design a specialty ship to carry semi-dry wood pulp (noodle pulp) from British Columbia to the mill in Antioch. Built at Kure Shipyard in Japan and christened the Duncan Bay, the pulp tanker was 587-foot long with an 84-foot beam. It was considered “a major contribution to a problem that is attaining significant importance in British Columbia’s pulp industry–the high cost of pulp transportation” (The Log 1956:41).

Apparently, the pulp shipping business was not cost effective and Crown Zellerbach scrapped the idea after a short time. In an interview with William J. Zellerbach and Stephen A. Zellerbach (1992:24), Willian spoke of the plan, “The ship would come down from Elk Falls to Antioch and discharge the pulp in a dry form, then water would be added and the mixture run over a paper machine. The whole thought was that they could save on transportation costs.” According to William, the *Duncan Bay* was leased to the company and when the lease was up “they said goodbye with great glee because it was a money loser.” In 1971, the ship was renamed the *Cedros Pacific* and in 1979 it was scrapped.

Crown Zellerbach operated the Antioch paper mill until 1986, and in the last 10 years produced only recycled paper. A hostile takeover by Sir James Goldsmith put an end to the paper-making giant. The Antioch mill became part of the Gaylord Container Corporation at that time. Operations continued under the Gaylord Container name until 2002.

Statement of Significance
The following conclusions were reached regarding the property’s eligibility for the National Register and California Register

Criterion A/1. The former Crown Zellerbach wharf was constructed in 1956 to receive shipments for the company’s new kraft paper mill. An explicit purpose for this wharf was to receive noodle pulp via a specialty tanker designed to carry semi-dry wood pulp. At the time, the pulp tanker was considered an innovative method to cut shipping costs though it did not prove to be cost effective after all. The mill made a significant contribution to the area’s industrial growth but the wharf and a pumping station area all that remain of the paper mill. Those structures alone do not adequately convey the importance of the paper mill; Criterion A/1 is not met.

Criterion B/2. The wharf does not meet Criterion B/2. Under this criterion, a property can be significant because of its association with an important person or group of people. While the Antioch paper mill and adjacent wharf were part of the Crown Zellerbach empire, the mill has been demolished and the wharf alone does not adequately reflect the company’s historical importance.

Criterion C/3. The wharf does not meet Criterion C/3. This criterion speaks to the architectural significance of a property. The wharf’s architecture is not of special note, nor is the firm of Earl and Wright, Civil Engineers who designed the wharf.

Criterion D/4. This property does not meet Criterion D/4. This criterion generally applies to archaeological resources or resources that, through study of construction details, can provide information that cannot be obtained in other ways. This structure possesses no intrinsic qualities that could answer questions or provide important information about our history

Integrity Considerations

The Crown Zellerbach wharf retains excellent integrity of location, though integrity of design, setting, workmanship, and materials is diminished by changes to the wharf and its surroundings. The wharf was modified in 1965, adding to its length and changing its footprint. A new ramp and conveyer system were added and walkways were reconfigured. While those changes could, themselves, be old enough to be historically significant the conveyor system has been removed, and the setting changed drastically when the associated paper mill was demolished. For a resource to have integrity, most if not all of the elements of integrity should be present; the wharf lacks the integrity necessary for inclusion on the National or California Register.

B12. References:

California State Lands Commission
1971 Amendment and 10-year Renewal of Lease PRC 1546.1, Tide and Submerged Land in San Joaquin River, Contra Costa County; Crown Zellerbach Corporation - W 8802, PRC 1546.I. http://archives.slc.ca.gov/Meeting_Summaries/1971_Documents/07-26-71/Items/72671C11. pdf

Cartwright Aerial Surveys
1965 Flight CAS_65_130, Frame 9-215. 1:12,000. 1 May 1965. Map & Imagery Laboratory, UC Santa Barbara Library.

1971 Flight CAS_71_3069, Frame 8-47. 1:12,000. 31 March 1971. Map & Imagery Laboratory, UC Santa Barbara Library.

1981 Flight CAS_81_81081, Frame 1-48. 1:12,000. 8 April 1981. Map & Imagery Laboratory, UC Santa Barbara Library.

Center for Land Use Interpretation
2016 Slide Show: A Counter-Clockwise Loop Around the Shoreline of the San Francisco Bay Area. Slide 56_antioch_plant_site.jpg. <http://www.clui.org/page/a-counter-clockwise-loop-around-shoreline-san-francisco-bay-area>

Crown Zellerbach Corporation, Central Engineering
1968 Plans for the 1968 Dock Extensions and Details.

Earl and Wright, Consulting Engineers
1955 Plans for the Crown Zellerbach Wharf.
1956 Plans for the Crown Zellerbach Wharf Reconstruction.

The Log
1956 Wood pulp can now become a tanker cargo. *The Log*, Vol. 51, No. 1, pp. 50-51.

Oakland Tribune
1956 $150,000 Fire Hits Newly Completed Antioch Wharf. *Oakland Tribune*, 15 June 1956.

Purcell, M.
1940 *History of Contra Costa County.* Gillick Press, Berkeley.

San Francisco Examiner
1895 *San Francisco Examiner*
1954 Crown to build in Antioch. *San Francisco Examiner*, 11 November 1954.

Zellerbach, W. and S. Zellerbach
1992 Recollections: Interviews with William J. Zellerbach and Stephen A. Zellerbach. Interviewed by G. Morris. Oral History Center, The Bancroft Library, University of California, Berkeley.

Figure 3. View of main wharf deck, facing east-northeast.

Figure 4. Piling system beneath main deck. Timber piles are covered with shotcrete for fire resistance.

Figure 5. West end walkway and mooring docks, facing west-southwest.

Figure 6. View toward main wharf area with Breasting dolphin at left and adjacent 1968 addition.

Figure 7. View from trestle toward addition at the east end of the dock and reconfigured walkway to mooring docks.

Figure 8. Hopper from upper to lower deck. Conveyor ran directly toward the camera on its way to shore.

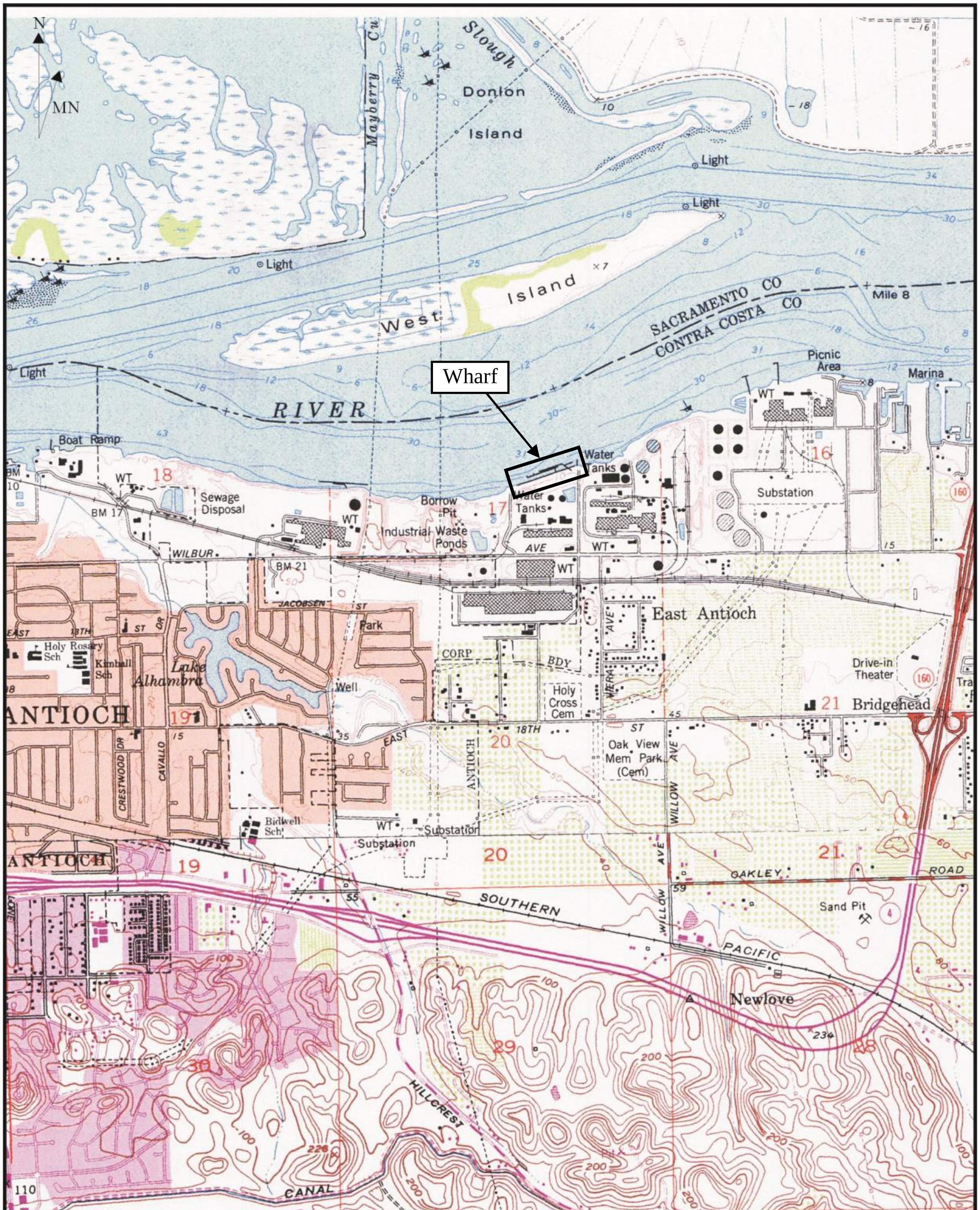
Figure 9. 16-pile Pivot dolphin off east end of wharf and eastern mooring docks.

Figure 10. Walkway and pipeline below concrete deck.

LOCATION MAP

Primary #: P-
HRI #:
Trinomial:

Page 11 **of** 11
Resource Name or #: Crown Zellerbach Wharf
Map Name: Antioch North **Scale:** 7.5’ **Date of Map:** 1978



Scale 1:24,000

1 0.5 0 1 Mile

1 0.5 0 1 Kilometer

APPENDIX D

STORMWATER CONTROL PLAN

for

AMPORTS Antioch

Vehicle Processing Facility Antioch Wharf – On-Site Facilities

2301 Wilbur Avenue

Antioch, California

PREPARED BY:

TranSystems Corporation
2000 Center Street, Suite 303
Berkeley, CA 94704

TABLE OF CONTENTS

Tables

Figures

Attachments

This Stormwater Control Plan was prepared using the template dated February 2018.

I. PROJECT DATA

Table 1: Project Data

Project Name/Number	AMPORTS Antioch Vehicle Processing Facility
Application Submittal Date	11/20/2020
Project Location	2301 Wilbur Avenue, Antioch, California 94509
Name of Developer	AMPORTS
Project Phase No.	N/A
Project Type and Description	Automotive logistics and processing facility
Project Watershed	San Joaquin Delta
Total Project Site Area (acres)	38.9 Acres
Total Area of Land Disturbed (acres)	6.5 Acres
Total New Impervious Surface Area (sq. ft.)	0 sf
Total Replaced Impervious Surface Area	282,125 sf (6.5 Ac)
Total Pre-Project Impervious Surface Area	1,363,920 sf (31.3 Ac)
Total Post-Project Impervious Surface Area	1,351,770 sf (31.0 Ac)
50% Rule[*]	Doesn't Apply
Project Density	Floor Area Ratio = 1.77% = 0.69 Ac / 38.9 Ac
Applicable Special Project Categories [Complete even if all treatment is LID]	None
Percent LID and non-LID treatment	LID treatment for 20% of impervious surfaces, see section IV, "Documentation of Drainage Design" for details.
HMP Compliance [†]	Exempt – See page 6

[*50% rule applies if:
Total Replaced Impervious Surface Area > 0.5 x Pre-Project Impervious Surface Area]

[†HM required (unless project meets one of the exemptions on *Guidebook* p. 9) if:
(Total New Impervious Surface Area + Total Replaced Impervious Surface Area) ≥ 1 acre]

II. SETTING

II.A. Project Location and Description

AMPORTS is developing an automotive logistics and processing facility in Antioch, California on property located at 2301 Wilbur Avenue. The site was the previous location of the Gaylord Paper Mill, and is zoned for industrial use. The site will be used for delivery and storage of vehicles and limited processing prior to distributions to dealerships. The improved site will include conversion and upgrade of the existing wharf to support roll-on/roll-off (RORO) operations, a one-story vehicle processing building with offices, as well as grading, fencing, paving, and striping for car storage and loading prior to distribution. The project also includes select demolition of existing raised slabs and out of service utilities, new utility connections and on-site stormwater improvements.

AMPORTS is an automotive service industry import/export business. The company has been in the industry for over 60 years, and has locations throughout the United States and Mexico. This facility will accommodate ships arriving with new vehicles, off-loading vehicles, minor processing and storage of vehicles prior to truck hauling to area dealerships. The number of employees expected to be employed at the Antioch facility is approximately 45 people per shift with additional independent trucking companies hauling to and from the site. Employee parking will be restricted to the existing lot, east of the main entrance to the facility. ADA parking will be added to the southeast of the new planned building. One new pre-engineered metal building is to be built onsite. The building will be approximately 25,328 square feet (0.58 acres) in size and will include restrooms, vehicle processing and work space. A new perimeter fence which is 8' high chain link with barbed wire fence extensions will be installed around the property and along Wilbur Street. Minor landscaping will be installed along Wilbur Street and around the new processing building on-site. All existing pervious and open areas will remain.

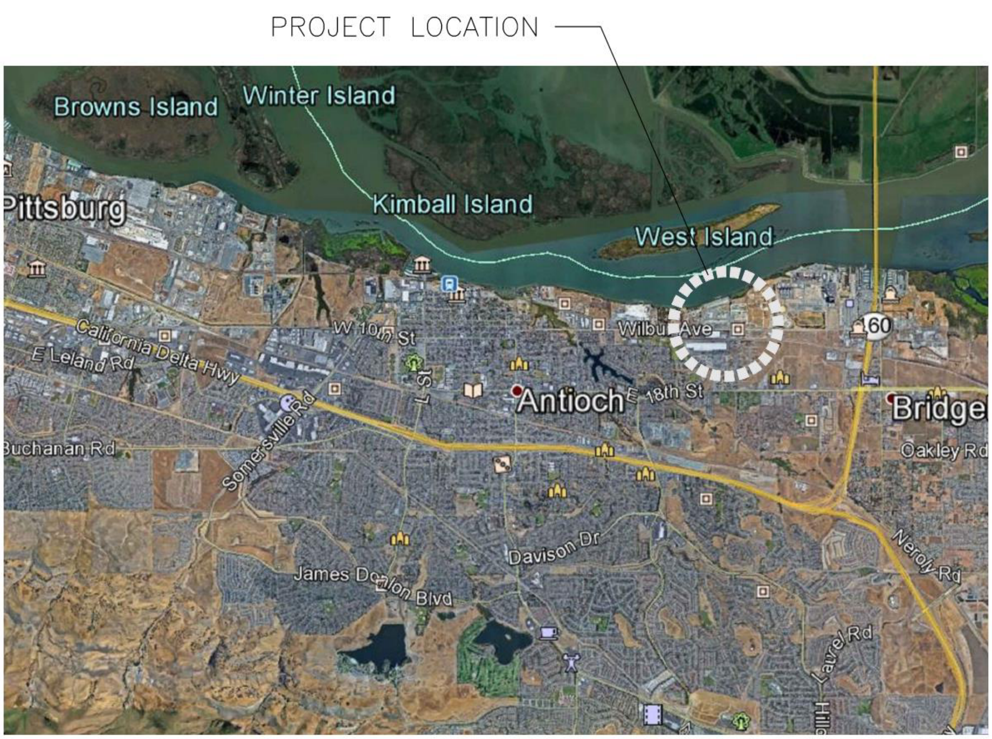


Figure 1: Vicinity Map

II.B. Existing Site Features and Conditions

The existing site is zoned for industrial use and was the previous location of the Gaylord Paper Mill. In recent years the site has been used as a lot for vehicle staging and storage. Therefore, the site now consists overwhelmingly of existing asphalt and concrete vehicle staging area pavement. There two raised slabs remaining from previous uses, although most have been previously demolished. The only existing building on site is a storage building that is approximately 5,000 square feet (0.11 acres) and a guard house near the front entrance, which are expected to remain in place.

The Natural Resources Conservation Service's Web Soil Survey classifies the existing soil at the site as "Hydrologic Group A," which means that the soils have high infiltration rates even when thoroughly wetted. See Attachment A for the NRCS soil classification.

The entire site consistently drains to the north toward the San Joaquin Delta. The majority of runoff across the site surface drains toward various inlets. The lone exception to that rule is the strip of existing greenspace along the west property line. This area is self-treating and does not contribute to the overall site runoff, See sheet Attachment B for existing drainage patterns.

Through an on-site visit and observation, it has been confirmed that runoff from the existing site is eventually collected in the existing storm drain system and piped through closed hard pipe to the stormwater detention facility at the northwest corner of the site. From there it outfalls directly into the delta.

The AMPORTS project site meets two of the three possibly scenarios for exemption from HM requirements.

- The post-project impervious area is less than, or the same as, the pre-project impervious area.
- The project is located in a catchment or subwatershed that is highly developed (that is, 70% or more impervious)

No new impervious area will be added to the site. The proposed building and pavement improvements will only replace existing impervious surface on a site that already contains over 80% impervious surface and impervious pavement will be demolished for the proposed bioretention facilities. The proposed improvement will seek to protect and maintain all existing pervious area currently present on the site. Due to these factors, this stormwater control report seeks exemption from the CCCWP's hydrograph modification requirements and will propose the use of "Option 4: Bioretention Facility" to demonstrate compliance with the CCCWP's hydrograph modification requirements.

II.C. Opportunities and Constraints for Stormwater Control

The project site is constrained by the following:

- Site History
    - The historical and current use of the project site was for industrial use. Due to this, the presence of durable impervious pavement becomes valuable to the site operators. The impervious area shown on the project plans will be used for specific on-site operations.
- Existing Wharf-side Storm Drain Infrastructure
    - The existing storm drain system to which all surface stormwater tie into is located at the northwest corner of the site near the wharf. This location is extremely shallow due to its location and therefore provide limited space constraints with treating that portion of the project. Fortunately, the majority of pavement replacement is proposed at higher elevations and this plan proposed to treat water further upstream.

The project has the following opportunities:

- Existing soils
    - Soils on site are classified as hydrologic group A, which means there is good potential for infiltration, where possible. This means that any runoff directed toward existing pervious areas or bioretention basins has the potential to increase infiltration across the site.
- The existing grade change makes treatment possible
    - The large grade change across the site from south to north provide ample elevation for stormwater treatment via bioretention facilities. This will allow well place facilities to treat a larger percentage of the site than would have been possible otherwise.
- Existing stormwater detention facilities
    - The site currently already has stormwater detention in place and this project seeks to maintain or reduce the amount of impervious surface runoff directed toward the facility.
- The project will include new landscaping
    - Although the majority of the existing pervious area will be contained on site and behind the security fence. The project contains proposed landscaping along Wilbur Avenue, where currently there is none.

III. LOW IMPACT DEVELOPMENT DESIGN STRATEGIES

III.A. Optimization of Site Layout

III.A.1. Limitation of development envelope

The primary limitation for the project site is its use as an industrial business location. Give that it has valuable wharf access for processing vehicles, impervious area for staging vehicles becomes a premium priority. However, although the project proposes to replace over 6 acres of impervious surface, that amount has been reduced as much as possible in order to preserve existing conditions. The proposed pavement improvements are the minimum possible to make the site usable for its intended purpose. Other conceptual iterations of the design had a larger impervious footprint, however, it was decided to preserve all existing vegetated area on site.

III.A.2. Preservation of natural drainage features

There are obvious water quality and quantity benefits to allowing runoff to fall on grassy areas than on paved areas. For this reason what little green space exists on the site should be kept and maintained. The portion of the site along the west property line and directly to the west of the entrance is being retained as a grassy/vegetated area to allow as much of the existing stormwater benefits of that area to remain.

III.A.3. Minimization of imperviousness

The site proposes to leave as much pervious area as is feasible while still maintaining the underlying purpose of the project. The usability of each section of impervious pavement was evaluated to determine if it could be reused or needed to be replaced. The intention was to minimize the impacts of the project as much as possible while providing a well-functioning site post construction. In addition, all of the existing trees on site would be preserved.

III.B. Use of Permeable Pavements

The use of permeable pavements on this project is infeasible due to the long term durability and maintenance costs.

- If permeable pavement were to be used on site, it would not hold up to the long term wear and tear of the intended vehicular traffic. The site will see daily use of vehicles, similar to a city street, where permeable pavement would not be acceptable.
- The maintenance cost in the long-term would not provide a feasible product to the owner/operator of the facility from a cost-benefit perspective. – NO COST REASONING

III.C. Dispersal of Runoff to Pervious Areas

The location of the proposed work does not allow opportunities to direct runoff from impervious surfaces to pervious surfaces. For proposed grading and drainage design, see Attachment C.

III.D. Integrated Management Practices

The project will create two separate bioretention areas at the northern edge of the street side portion of the site that will collect and treat runoff from some of the new asphalt pavement as well as some of the old pavement areas.

This location is optimal as it captures the maximum amount of surface water runoff possible and provides ample elevation for the required 18" of biosoil and for gaining the proper hydraulic head needed for the bioretention basins to work correctly. The bioretention area will drain through an underdrain to an overflow structure, then to the nearest existing storm drain structure on site.

The portion of the site that does not drain to the bioretention basins will maintain existing drainage patterns.

See Attachment C for proposed drainage design and Attachment D for project site drainage management areas.

IV. DOCUMENTATION OF DRAINAGE DESIGN

IV.A. Descriptions of each Drainage Management Area

IV.A.1. Table of Drainage Management Areas

Table 2: Drainage Management Areas

DMA Name	*Area (SF)*	*Surface Type /Description*	*Drains to*
W-01	*146,770*	*Impervious Concrete and Asphalt Pavement*	*West Bioretention Area*
W-02	*73,710*	*Pervious, undisturbed, natural area that drains overland off-site*	*Off-Site*
E-01	*136,360*	*Impervious Concrete and Asphalt Pavement*	*East Bioretention Area*

IV.A.2. Drainage Management Area Descriptions

DMA W-01, totaling 146,770 square feet, drains existing and proposed impervious pavement used for vehicle staging. It drains to the West Bioretention Area.

DMA W-02, totaling 73,710 square feet, drains existing pervious, undisturbed natural area that will remain undisturbed area. It drains off-site to the west of the property. This area does not contribute to the existing on-site drainage infrastructure and is listed for completeness.

DMA E-01, totaling 136,360 square feet, drains existing and proposed impervious pavement used for vehicle staging. It drains to the East Bioretention Area.

The above drainage management areas do not account for the entire existing property. The rest of the existing project site drains to the existing drainage system on-site and ends up at the existing stormwater detention facility at the northwest corner of the site. This area consists primarily of impervious paved areas that will be used for the operations vehicle staging, as well as, the existing building, the new building, and some undisturbed existing pervious areas which will remain. See Attachment D for project site drainage management areas.

There is no proposed work on site that would allow for opportunities to utilize the existing natural landscaped areas as LID IMPs. Additionally, there is little to no offsite surface runoff that could be treated as a part of this project.

For the purposes of this project, these drainage and detention patterns will remain the same as the existing conditions. The project seeks to add the necessary LID treatment required to satisfy the CCCWP requirements, given the scope of the project goals.

IV.B. Tabulation and Sizing Calculations

IV.B.1. Areas Draining to IMPs

See Attachment E for CCCWP IMP calculator results.

IV.B.2. Information Summary for IMP Design

Table 3: Information Summary for IMP Design

Total Project Area (Square Feet)	283,130
Mean Annual Precipitation	13.1
IMPs Designed For:	Treatment Only

V. SOURCE CONTROL MEASURES

V.A. Site activities and potential sources of pollutants

The only site activities that may be a potential source of pollutants is vehicle traffic that will be present on site.

V.B. Source Control Table

Table 4: Sources and Source Control Measures

Potential source of runoff pollutants	*Permanent source control BMPs*	*Operational source control BMPs*
On-site storm drain inlets	Mark all inlets with "No Dumping! Drains to Bay" or similar.	Maintain and periodically repaint or replace inlet markings. Provide stormwater pollution prevention information to new site owners, lessees, or operators.
Interior floor drains	Interior floor drains will be plumbed to sanitary sewer.	Inspect and maintain drains to prevent blockages and overflow.
Plazas, sidewalks, and parking lots	None	Sweep drive aisles and parking areas regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.

V.C. Features, Materials, and Methods of Construction of Source Control BMPs

Facility cleaning and maintenance of storm drain inlet markings will be done as part of AMPORTS on-site maintenance.

VI. STORMWATER FACILITY MAINTENANCE

VI.A. Ownership and Responsibility for Maintenance in Perpetuity

See Attachment F for designation of responsible individuals.

VI.B. Summary of Maintenance Requirements for Each Stormwater Facility

Stormwater BMPs must be inspected regularly and maintained to ensure that the stormwater quality system functions as designed. The bioretention basin must be inspected at minimum on a yearly basis to verify that runoff infiltrates into the subsurface completely within the prescribed infiltration time of 48 hours or less after a storm and sediment hasn't built up. Any buildup of sediment must be removed and the bottom restored with the specified biotreatment soil and vegetation. Basin vegetation should be inspected at the same time to maintain the aesthetic appearance of the site as well as to prevent vegetation from interfering with basin operation. This may include mowing or pruning overgrown vegetation, re-vegetating areas that become bare, removal of fallen leaves and other debris, and removal of invasive vegetation.

See Attachment G for Stormwater BMP Inspection and Maintenance Log.

VII. CONSTRUCTION PLAN C.3 CHECKLIST

Table 5: Construction Plan C.3 Checklist

Stormwater Control Plan Page #	*BMP Description*	*See Plan Sheet #s*
Attachment C	East Bioretention Area and West Bioretention Area	CG-101

VIII. CERTIFICATIONS

The selection, sizing, and preliminary design of stormwater treatment and other control measures in this plan meet the requirements of Regional Water Quality Control Board Order R2-2009-0074 and Order R2-2011-0083.

ATTACHMENT A
HYDROLOGIC SOIL GROUP CLASSIFICATION

Map Scale: 1:3,000 if printed on B portrait (11" x 17") sheet.

Meters: 0 40 80 160 240

Feet: 0 100 200 400 600

N

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Contra Costa County, California
Survey Area Data: Version 17, May 29, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 23, 2019—Apr 29, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
DaC	Delhi sand, 2 to 9 percent slopes	49.7	78.9%
W	Water	13.3	21.1%
Totals for Area of Interest		**63.0**	**100.0%**

Map Unit Description

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this report, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named, soils that are similar to the named components, and some minor components that differ in use and management from the major soils.

Most of the soils similar to the major components have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Some minor components, however, have properties and behavior characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. All the soils of a series have major horizons that are similar in composition, thickness, and arrangement. Soils of a given series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Additional information about the map units described in this report is available in other soil reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the soil reports define some of the properties included in the map unit descriptions.

Contra Costa County, California

DaC—Delhi sand, 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: h98s
Elevation: 10 to 150 feet
Mean annual precipitation: 12 to 14 inches
Mean annual air temperature: 59 degrees F
Frost-free period: 260 to 300 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Delhi and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Delhi

Setting

Landform: Alluvial fans, flood plains, terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Eolian deposits derived from igneous and sedimentary rock

Typical profile

H1 - 0 to 5 inches: sand
H2 - 5 to 60 inches: sand

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Unnamed

Percent of map unit: 12 percent
Hydric soil rating: No

Laugenour

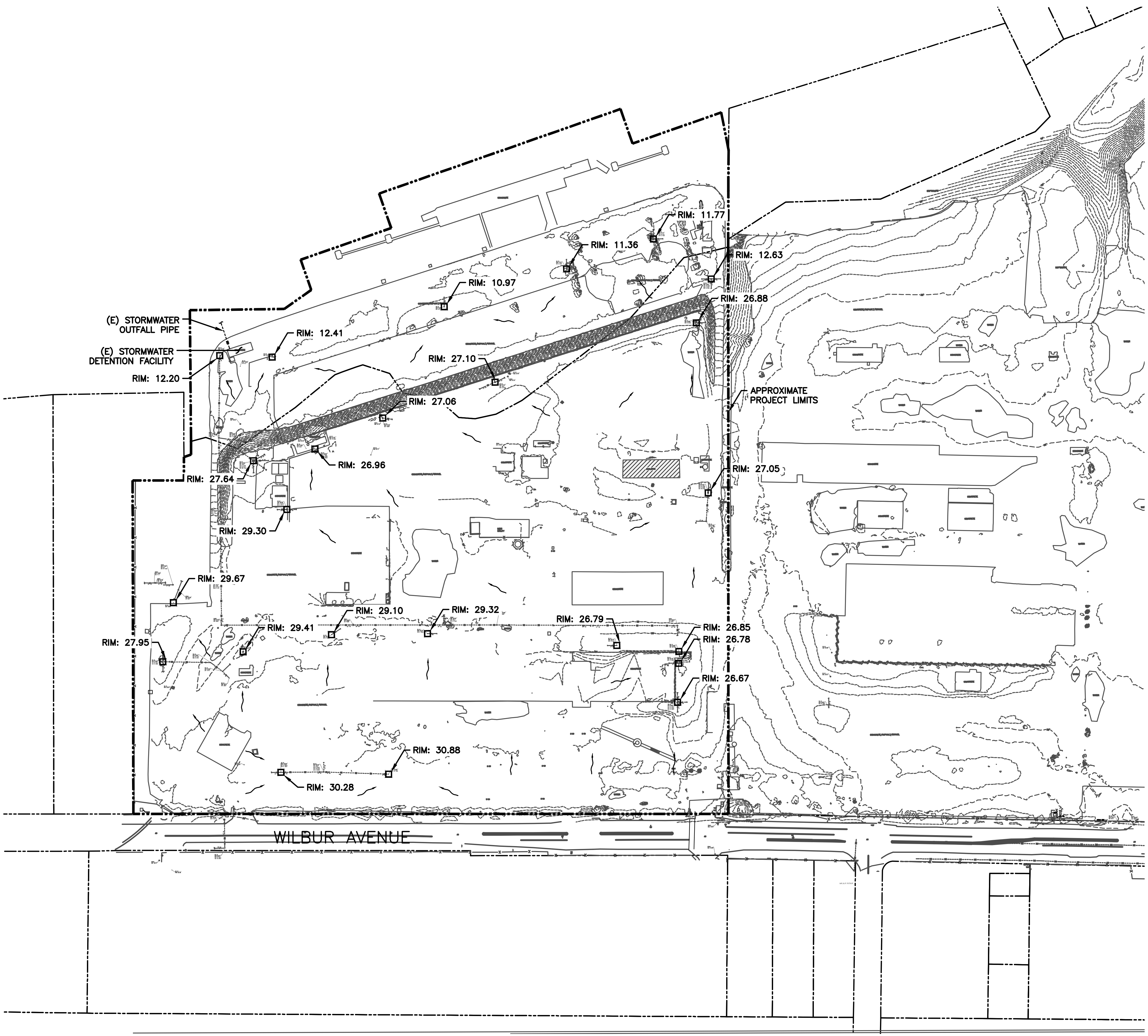
Percent of map unit: 3 percent

Hydric soil rating: No

Data Source Information

Soil Survey Area: Contra Costa County, California
Survey Area Data: Version 17, May 29, 2020

ATTACHMENT B
EXISTING DRAINAGE CONDITIONS



LEGEND

- STORM DRAIN INLET
- FLOW ARROW

N

PRELIMINARY SCOPING PLANS
NOT FOR CONSTRUCTION

0 100 200 300
SCALE FEET
1" = 100'

TranSystems
2000 CENTER ST
SUITE 303
BERKELEY, CA 94704
PHONE: 510-835-2761
FAX: 510-842-1579

CONSULTANTS:

AMPORTS ANTIOCH
VEHICLE PROCESSING FACILITY
2301 WILBUR AVENUE, ANTIOCH, CA

AMPORTS

REVISIONS:

MARK	DATE	DESCRIPTION

PROJ NO: P309190180
SCALE: AS SHOWN
DATE: 11/20/2020
DESIGNED BY: GMS
DRAWN BY: GMS
CHECKED BY: RC/MLR

SHEET TITLE:

EXISTING
DRAINAGE
CONDITIONS

SHEET NO.
ATTACHMENT - B
SHEET OF 13

IF THIS DRAWING IS LESS THAN 24" X 36" IT IS A REDUCED SIZE DRAWING

C:\transystems\pw_local\transyscorp-pw1\ssmirza\d0912241\ATTACHMENT- B.dwg, Plotted: Nov 19, 2020 - 3:20pm

ATTACHMENT C
PROPOSED DRAINAGE

GENERAL NOTES

A. SEE G-001 FOR PROJECT VICINITY AND LOCATION MAPS.

B. PRELIMINARY EARTHWORK CALCULATIONS HAVE BEEN PERFORMED AT THIS TIME WITHOUT A GEOTECHNICAL REPORT OR ASSESSMENT AND UTILIZING ASSUMPTIONS FOR EXISTING SITE INFRASTRUCTURE SECTIONS. EARTHWORK CALCULATIONS WILL BE UPDATED AS THE CONCEPTUAL DESIGN PROGRESSES TO CONSTRUCTION DOCUMENTS.

KEY NOTES

1. NEW STORM DRAIN LINE. TIE INTO EXISTING STORM DRAIN SYSTEM ON-SITE.
2. NEW STORM DRAIN AREA INLET.
3. EAST BIORETENTION AREA AND WEST BIORETENTION AREA FOR STORMWATER TREATMENT. 3:1 SIDE SLOPE, TYP.
4. NEW AC PAVEMENT AREA WILL REQUIRE GRADE CHANGES. SEE FLOW ARROWS FOR PROPOSED FLOW DIRECTION.

LEGEND

- (E) PAVEMENT TO REMAIN
- NEW AC PAVEMENT
- NEW BIORETENTION BASIN
- (E) PERVIOUS AREA TO REMAIN
- SD NEW STORM DRAIN LINE
- STORM DRAIN INLET
- (E) STORM DRAIN INLET
- SURFACE FLOW DIRECTION

PRELIMINARY EARTHWORK	
CUT (CY)	6,660
FILL (CY)	4,110
NET CUT (CY)	2,550

N

PRELIMINARY SCOPING PLANS
NOT FOR CONSTRUCTION

0 100 200 300
SCALE FEET
1" = 100'

TranSystems
2000 CENTER ST
SUITE 303
BERKELEY, CA 94704
PHONE: 510-835-2761
FAX: 510-842-1579

CONSULTANTS:

AMPORTS ANTIOCH
VEHICLE PROCESSING FACILITY
2301 WILBUR AVENUE, ANTIOCH, CA

AMPORTS

REVISIONS:

MARK	DATE	DESCRIPTION

PROJ NO: P309190180
SCALE: AS SHOWN
DATE: 11/20/2020
DESIGNED BY: GMS
DRAWN BY: GMS
CHECKED BY: RC/MLR

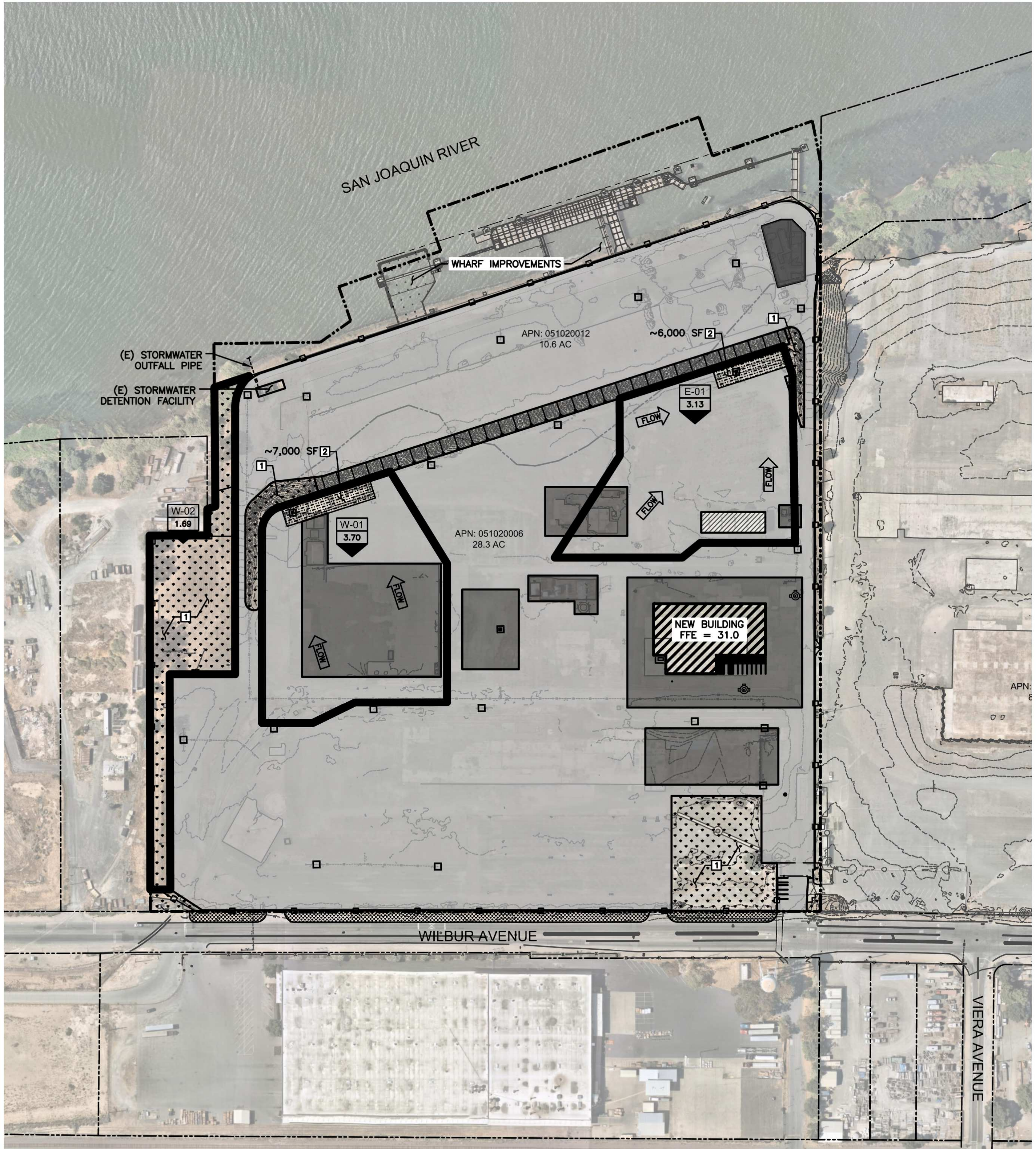
SHEET TITLE:
PROPOSED DRAINAGE

SHEET NO.
ATTACHMENT - C
SHEET OF 13

C:\transystems\pw_local\transyscorp-pw1\asmirza\d0912241\ATTACHMENT - C.dwg, Plotted: Nov 19, 2020 - 3:18pm

IF THIS DRAWING IS LESS THAN 24" X 36" IT IS A REDUCED SIZE DRAWING

ATTACHMENT D
DRAINAGE MANAGEMENT AREAS



PROJECT AREA TOTALS

DESCRIPTION	AREA (SF)	AREA (AC)
TOTAL PROPERTY AREA	1,693,232	38.9
EXISTING IMPERVIOUS AREA	1,363,920	31.3
NEW OR REPLACED IMPERVIOUS AREA	282,125	6.5
FINAL IMPERVIOUS AREA	1,351,770	31.0
(%) CHANGE IMPERVIOUS AREA	1% DECREASE	1% DECREASE
CONSTRUCTION DISTURBANCE AREA	282,125	6.5

DRAINAGE MANAGEMENT AREAS

DMA	DESCRIPTION	AREA (SF)	AREA (AC)	DRAINS TO:
W-01	IMPERVIOUS VEHICLE PARKING AREA	146,770	3.7	WEST BIORETENTION
W-02	PERVIOUS, UNDISTURBED, NATURAL AREA THAT IS SELF TREATING	73,710	1.7	OFF-SITE
E-01	IMPERVIOUS VEHICLE PARKING AND BUILDING AREA	136,360	3.1	EAST BIORETENTION

TREATMENT AREA TOTALS

AREA TYPE	AMOUNT REQ'D TO BE TREATED	AMOUNT TREATED BY PROJECT	DIFFERENCE
NEW OR REPLACED IMPERVIOUS AREA	282,125 SF (6.5 AC)	283,130 SF (6.83 AC)*	1,005 SF (0.33 AC) EXCESS (TREATING MORE THAN REQ'D)

* INCLUDES BIORETENTION AREAS

GENERAL NOTES

A. SEE G-001 FOR PROJECT VICINITY AND LOCATION MAPS.

B. THE NRCS CLASSIFIES THE EXISTING SOIL AT THE SITE AS "HYDRAULIC GROUP A".

KEY NOTES

1. EXISTING PERVIOUS AREA TO REMAIN UNDISTURBED.
2. BIORETENTION BASIN FOR STORMWATER TREATMENT. CONSISTS OF 4% OF NEW LAND SIDE IMPROVEMENT AREAS (~12,200 SF TOTAL).

LEGEND

- (E) PAVEMENT TO REMAIN
- NEW AC PAVEMENT
- NEW BIORETENTION BASIN
- (E) PERVIOUS UNDISTURBED AREA
- STORM DRAIN INLET LOCATION
- FLOW SURFACE WATER FLOW DIRECTION
- PROJECT LIMITS
- DRAINAGE BASIN LIMITS
- XXX XXX.XX DRAINAGE BASIN CALLOUT

N

PRELIMINARY SCOPING PLANS
NOT FOR CONSTRUCTION

0 100 200 300
SCALE FEET
1" = 100'

TranSystems
2000 CENTER ST
SUITE 303
BERKELEY, CA 94704
PHONE: 510-835-2761
FAX: 510-842-1579

CONSULTANTS:

AMPORTS ANTIOCH
VEHICLE PROCESSING FACILITY
2301 WILBUR AVENUE, ANTIOCH, CA

AMPORTS

REVISIONS: MARK DATE DESCRIPTION

PROJ NO: P309190180
SCALE: AS SHOWN
DATE: 11/20/2020
DESIGNED BY: GMS
DRAWN BY: GMS
CHECKED BY: RC/MLR

SHEET TITLE:
DRAINAGE MANAGEMENT AREAS

SHEET NO.
ATTACHMENT - D
SHEET OF 13

C:\transystems\pw_local\transyscorp-pw1\asmirza\d0912241\ATTACHMENT - D.dwg, Plotted: Nov 19, 2020 - 3:18pm

IF THIS DRAWING IS LESS THAN 24" X 36" IT IS A REDUCED SIZE DRAWING

ATTACHMENT E
IMP CALCULATOR RESULTS

Project Name: AMPORTS Antioch Vehicle Processing Facility
Project Type: Treatment Only
APN: N/A
Drainage Area: 296,130
Mean Annual Precipitation: 13.1

IV. Areas Draining to IMPs

IMP Name: West Bioretention
IMP Type: Bioretention Facility
Soil Group: West Bioretention

DMA Name	Area (sq ft)	Post Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor
W-01	146,770	Concrete or Asphalt	1.00	146,770
			Total	146,770

IMP Sizing

	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
Area	0.040	1.000	5,871	7,000

IMP Name: East Bioretention
IMP Type: Bioretention Facility
Soil Group: East Bioretention

DMA Name	Area (sq ft)	Post Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor
E-01	136,360	Concrete or Asphalt	1.00	136,360
			Total	136,360

IMP Sizing

	IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
Area	0.040	1.000	5,454	6,000

Report generated on 11/17/2020 12:00:00 AM by the Contra Costa Clean Water Program IMP Sizing Tool software (version 1.3.1.0).

ATTACHMENT F
DESIGNATION OF RESPONSIBLE INDIVIDUALS

Designation of Individuals Responsible for Stormwater Treatment BMP Operation and Maintenance	
Date Completed TBD	
Facility Name **AMPORTS Antioch Vehicle Processing Facility**	
Facility Address 2301 Wilbur Avenue, Antioch, CA 94509	
Designated Contact for Operation and Maintenance	
Name:	Title or Position:
Telephone:	Alternate Telephone:
Email:	
Off-Hours or Emergency Contact	
Name:	Title or Position:
Telephone:	Alternate Telephone:
Email:	
Corporate Officer (authorized to execute contracts with the City, Town, or County)	
Name:	Title or Position:
Address:	
Telephone:	Alternate Telephone:
Email:	

ATTACHMENT G

STORMWATER BMP INSPECTION AND MAINTENANCE LOG AND OPERATIONS & MAINTENANCE PLAN

Stormwater BMP Inspection and Maintenance Log

Facility Name AMPORTS Antioch Vehicle Processing Facility	
Address 2301 Wilbur Avenue, Antioch, CA 94509	
Begin Date	End Date

Date	BMP ID#	BMP Description	Inspected by:	Cause for Inspection	Exceptions Noted	Comments and Actions Taken

Instructions: Record all inspections and maintenance for all treatment BMPs on this form. Use additional log sheets and/or attach extended comments or documentation as necessary. Submit a copy of the completed log with the annual independent inspectors' report to the municipality, and start a new log at that time.

- BMP ID# — Always use ID# from the Operation and Maintenance Manual.
- Inspected by — Note all inspections and maintenance on this form, including the required independent annual inspection.
- Cause for inspection — Note if the inspection is routine, pre-rainy-season, post-storm, annual, or in response to a noted problem or complaint.
- Exceptions noted — Note any condition that requires correction or indicates a need for maintenance.
- Comments and actions taken — Describe any maintenance done and need for follow-up.

AMPORTS ANTIOCH VEHICLE PROCESSING FACILITY

MAINTENANCE MATRIX

The stormwater treatment facilities include the bioswale and its associated overflow structure and outflow storm pipe and the curb inlet, storm drain pipe, and self-retaining/ponding area at the west end of the site. A blockage in the storm drain system at the bioswale or self-retaining area will cause water to back up into the treatment facility or storm drain infrastructure and may damage it. For this reason, inspection and maintenance of these storm drain components is considered part of the inspection and maintenance of the treatment facilities. Normal functioning of the facilities may involve retention of water for up to 72 hours following significant storm events.

STORM DRAIN SYSTEM

Frequency Before each rainy season.	**Observation** Inspect the storm drain outfall at the creek. Look for obstructions, vegetation, debris, litter, sediment, etc. blocking the outfall. Check for bushes, trees, or other dense vegetation growing immediately in front of the outfall.	**Maintenance Activity** Remove obstructions, etc.
	Observation Inspect all catch basins. Look for obstructions, vegetation, debris, litter, sediment, etc. blocking the catch basins.	**Maintenance Activity** Remove obstructions, etc.
Frequency Before each rainy season and after the first heavy rain.	**Observation** Inspect the entire storm drain system from the upstream end to the outfall, including all catch basins. Observe the flow of water. Any evidence of ponding in the catch basins indicates a blockage.	**Maintenance Activity** Find and remove any obstructions. Flushing may be necessary.

BIORETENTION AREA – SUBDRAINS

Frequency Before each rainy season	**Observation** Inspect all subdrain cleanouts. Ensure that all cleanout caps are present. Look for obstructions, debris, trash, leaves, vegetation, etc. growing inside the subdrain or covering the cleanout.	**Maintenance Activity** Remove any obstructions by hand (if near the cleanout entrance) or by flushing (with pressurized water) if too far down the pipe. Replace missing caps and secure to prevent unauthorized removal or accidental displacement.
	Observation Inspect each subdrain where it enters the catch basin to see whether the subdrain pipe is dry, or is clogged with vegetation. Ensure that the subdrain is flowing by testing with water from the cleanout end.	**Maintenance Activity** If water does not flow through the subdrain, rod or flush the line to ensure flow.

BIORETENTION AREA - GENERAL

Frequency Before each rainy season	**Observation** Inspect curb cuts (gaps in curb for water to flow down to treatment facility). Look for any obstructions that will prevent water from leaving the street and flowing into the treatment facility. This includes litter, debris and vegetation. There should be at least a 1-inch drop from the curb cut to the erosion control rock. No vegetation should obstruct the flow of water through the curb cut.	**Maintenance Activity** Remove obstructions, clean litter and cut vegetation.
	Observation Inspect bank between curb cuts and treatment facility. Look for gullies, washouts, evidence of uncontrolled surface water flow or any other evidence of distress to the slope.	**Maintenance Activity** Repair bank by excavating gullies and replacing soil in its original configuration, properly compacted. Replace gravel or other erosion control device so that bank does not erode again.
	Observation Determine whether the bioretention area / swale is draining correctly. Inspect adjacent infrastructure, such as retaining walls, curbs and pavement for signs of failure caused by water intrusion into the surrounding soil. This is a sign of poor drainage from the treatment facility.	**Maintenance Activity** Determine the cause of the poor drainage (i.e. siltation of "sandy loam" soil mix, blocked subdrains, blocked catch basin, blocked storm drain) and repair.
Frequency After the first heavy rain.	**Observation** Determine whether the bioretention area / swale is draining correctly. Look for standing water or soggy, saturated soil. Look for holes containing standing water and permitting mosquitoes. This is a sign of poor drainage from the treatment facility. Water should drain from bioretention area / swale within 72 hours. After 72 hours, there should be no patches of standing water – bioretention area / swale should drain evenly.	**Maintenance Activity** Determine the cause of the poor drainage (siltation of "sandy loam" soil mix, blocked subdrains, blocked catch basin, blocked storm drain) and repair. Fill holes containing standing water with "sandy loam" soil mix. Tilling of "sandy loam" soil mix may be required. After several years, the soil medium may become impermeable because of silt deposition, in which case removal and replacement of the "sandy loam" soil mix and gravel will be required
Frequency Each month	**Observation** Inspect the bioretention area / swale for litter, debris, leaves, dead vegetation and anything else that might interfere with flow, filtration or growth of grass.	**Maintenance Activity** Remove all such litter, debris, leaves, dead vegetation, etc. by hand or with hand tools. Replace dead vegetation as appropriate.
Frequency Each month	**Observation** Inspect for growth of trees or invasive plants in grassy bioretention area / swale areas.	**Maintenance Activity** Remove invasive plants, weeds, shrubs, trees, or anything with a woody stem from grassy bioretention area / swale areas.

Frequency Each month	**Observation** Inspect condition of grass in bioretention area / swale. Grass must be of sufficient density and health to provide filtration and protect from erosion.	**Maintenance Activity** Mow as necessary, fertilize as necessary, note bare spots and reseed as necessary, remove dead grass and reseed as necessary. Fertilization is to be performed by a licensed professional. Only the minimum effective amount of fertilizer is to be used, to prevent downstream eutrification. Fertilizers used should be the most environmentally benign products available.
Frequency Before each dry season and each month throughout the dry season.	**Observation** Test the irrigation system. Observe whether all grassy areas in the bioretention area / swale are receiving the correct amount of water. Observe whether excessive irrigation is creating flow in the subdrains (irrigation should not cause any flow in subdrain).	**Maintenance Activity** Clean out all plugged sprinkler heads and filters. Straighten any displaced sprinkler heads. Replace any damaged sprinkler heads. Adjust for correct direction and throw distance. Set the sprinkler timer to provide enough water depending on the anticipated weather until the next irrigation inspection. Reduce the watering time if excess water flows from the subdrains.
Frequency Each month.	**Observation** Inspect for presence of pests which constitute a nuisance and/or threaten the survival of the grass in the bioretention area / swale.	**Maintenance Activity** Apply pesticide to the minimum amount necessary to control pests. All application of pesticide is to be performed by a licensed professional pest control contractor trained in Integrated Pest Management (IPM) techniques.
Frequency Ongoing	**Observation** Before making any modification to on-lot swales, downspouts, grading, landscaping or drainage patterns, ascertain what effect such modification will have on the flow of water to the treatment swales and/or bioretention area.	**Maintenance Activity** Refrain from any construction, grading, landscaping, piping or any other construction that will affect the flow of water to the treatment swales and/or bioretention area. Correct any changes that divert stormwater away from treatment facilities or otherwise reduce their effectiveness.
Frequency When treatment facilities are substantially failing to perform (estimated 15 years from installation)	**Observation** Treatment facilities are failing to drain and/or discharging “dirty water” into creek. Minor maintenance activities have failed to rectify problem.	**Maintenance Activity** Thorough inspection of stormwater facility by licensed professional (i.e., landscape contractor, landscape architect, civil engineer, etc.) Replacement of failed components and repair of stormwater facility to design specifications (per the Stormwater Control Plan).

SELF-RETAINING AREA

Frequency Before each rainy season.	**Observation** Inspect the vegetated area for debris. Look for trash or other particles or foreign matter that does not belong. Check inflow pipes for blockages. Look for accumulated sediment.	**Maintenance Activity** Remove obstructions, etc.
	Observation Inspect the grass/vegetation. Look for damaged, unhealthy, or dying plants.	**Maintenance Activity** Replace vegetation.
Frequency Before each rainy season and after the first heavy rain.	**Observation** Inspect the entire storm drain system from the upstream end to the outfall, including all catch basins. Observe the flow of water. Any evidence of ponding in the catch basins indicates a blockage.	**Maintenance Activity** Find and remove any obstructions. Flushing may be necessary.

APPENDIX E

ANTIOCH WHARF STRUCTURAL UPGRADE PROJECT CONSTRUCTION NOISE AND VIBRATION ASSESSMENT

Contra Costa County, California

May 7, 2019

Prepared for:

Jonathan Hidalgo, AICP
Senior Associate Environmental Planner
WRA, Inc.
4225 Hollis St.,
Emeryville, CA 94608

Prepared by:

Cameron Heyvaert
Michael S. Thill

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

429 East Cotati Avenue
Cotati, CA 94931
(707) 794-0400

Project: 19-027

INTRODUCTION

The project proposes a structural upgrade to the Antioch wharf by replacing existing dolphins and constructing new connected walkways and a roll-on roll-off (RoRo) ramp to connect the wharf to the shoreline. The project is located offshore along the San Joaquin River in an unincorporated area of Contra Costa County. The existing wharf is surrounded by industrial and commercial facilities to the west, east, and south, and the San Joaquin River to the north.

This report evaluates the potential for project construction activities to result in significant noise or vibration impacts with respect to applicable California Environmental Quality Act (CEQA) guidelines. The report is divided into two sections: 1) the Setting Section provides a brief description of the fundamentals of environmental noise and groundborne vibration summarizes applicable regulatory criteria, and discusses the existing noise conditions; and 2) the Impacts and Mitigation Measures Section describes the significance criteria used to evaluate project impacts, provides a discussion of each project impact, and presents measures, where necessary, to mitigate the impacts of the project on sensitive receptors in the vicinity.

SETTING

Fundamentals of Environmental Noise

Noise may be defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. The objectionable nature of sound could be caused by its *pitch* or its *loudness*. *Pitch* is the height or depth of a tone or sound, depending on the relative rapidity (frequency) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. *Loudness* is intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the height of an ocean wave in that it is a measure of the amplitude of the sound wave.

In addition to the concepts of pitch and loudness, there are several noise measurement scales which are used to describe noise in a particular location. A *decibel (dB)* is a unit of measurement which indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in acoustic energy, while 20 decibels is 100 times more intense, 30 decibels is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10 decibel increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities. Technical terms are defined in Table 1.

There are several methods of characterizing sound. The most common in California is the *A-weighted sound level (dBA).* This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Representative outdoor and indoor noise levels in units of dBA are shown in Table 2. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events.

This *energy-equivalent sound/noise descriptor* is called L_{eq}. The most common averaging period is hourly, but L_{eq} can describe any series of noise events of arbitrary duration.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends upon the distance the receptor is from the noise source. Close to the noise source, the models are accurate to within about plus or minus 1 to 2 dBA.

Since the sensitivity to noise increases during the evening and at night -- because excessive noise interferes with the ability to sleep -- 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The *Community Noise Equivalent Level* (*CNEL*) is a measure of the cumulative noise exposure in a community, with a 5 dB penalty added to evening (7:00 pm - 10:00 pm) and a 10 dB addition to nocturnal (10:00 pm - 7:00 am) noise levels. The *Day/Night Average Sound Level* (L_{dn} or *DNL*) is essentially the same as CNEL, with the exception that the evening time period is dropped and all occurrences during this three-hour period are grouped into the daytime period.

Effects of Noise

Sleep and Speech Interference

The thresholds for speech interference indoors are about 45 dBA if the noise is steady and above 55 dBA if the noise is fluctuating. Outdoors the thresholds are about 15 dBA higher. Steady noises of sufficient intensity (above 35 dBA) and fluctuating noise levels above about 45 dBA have been shown to affect sleep. Interior residential standards for multi-family dwellings are set by the State of California at 45 dBA L_{dn}/CNEL. Typically, the highest steady traffic noise level during the daytime is about equal to the L_{dn}/CNEL and nighttime levels are 10 dBA lower. The standard is designed for sleep and speech protection and most jurisdictions apply the same criterion for all residential uses. Typical structural attenuation is 12-17 dBA with open windows. With closed windows in good condition, the noise attenuation factor is around 20 dBA for an older structure and 25 dBA for a newer dwelling. Sleep and speech interference is therefore possible when exterior noise levels are about 57-62 dBA L_{dn}/CNEL with open windows and 65-70 dBA L_{dn}/CNEL if the windows are closed. Levels of 55-60 dBA are common along collector streets and secondary arterials, while 65-70 dBA is a typical value for a primary/major arterial. Levels of 75-80 dBA are normal noise levels at the first row of development outside a freeway right-of-way. In order to achieve an acceptable interior noise environment, bedrooms facing secondary roadways need to be able to have their windows closed; those facing major roadways and freeways typically need special glass windows.

Annoyance

Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that the causes for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The L_{dn}/CNEL as a measure of noise has been found to provide a valid correlation of noise level and the percentage of people annoyed. People have been asked to judge the annoyance caused by aircraft noise and ground transportation noise. There continues to be disagreement about the relative annoyance of these different sources. When measuring the percentage of the population highly annoyed, the threshold for ground vehicle noise is about 50 dBA L_{dn}/CNEL. At a L_{dn}/CNEL of about 60 dBA, approximately 12 percent of the population is highly annoyed. When the L_{dn}/CNEL increases to 70 dBA, the percentage of the population highly annoyed increases to about 25-30 percent of the population. There is, therefore, an increase of about 2 percent per dBA between a L_{dn}/CNEL of 60-70 dBA. Between a L_{dn}/CNEL of 70-80 dBA, each decibel increase increases by about 3 percent the percentage of the population highly annoyed. People appear to respond more adversely to aircraft noise. When the L_{dn}/CNEL is 60 dBA, approximately 30-35 percent of the population is believed to be highly annoyed. Each decibel increase to 70 dBA adds about 3 percentage points to the number of people highly annoyed. Above 70 dBA, each decibel increase results in about a 4 percent increase in the percentage of the population highly annoyed.

Fundamentals of Groundborne Vibration

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One method is the Peak Particle Velocity (PPV). The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. In this report, a PPV descriptor with units of mm/sec or in/sec is used to evaluate construction generated vibration for building damage and human complaints. Table 3 displays the reactions of people and the effects on buildings that continuous or frequent intermittent vibration levels produce. The guidelines in Table 3 represent syntheses of vibration criteria for human response and potential damage to buildings resulting from construction vibration.

Construction activities can cause vibration that varies in intensity depending on several factors. The use of pile driving and vibratory compaction equipment typically generates the highest construction related groundborne vibration levels. Because of the impulsive nature of such activities, the use of the PPV descriptor has been routinely used to measure and assess groundborne vibration and almost exclusively to assess the potential of vibration to cause damage and the degree of annoyance for humans.

The two primary concerns with construction-induced vibration, the potential to damage a structure and the potential to interfere with the enjoyment of life, are evaluated against different vibration limits. Human perception to vibration varies with the individual and is a function of physical setting and the type of vibration. Persons exposed to elevated ambient vibration levels, such as people in an urban environment, may tolerate a higher vibration level.

Structural damage can be classified as cosmetic only, such as paint flaking or minimal extension of cracks in building surfaces; minor, including limited surface cracking; or major, that may threaten the structural integrity of the building. Safe vibration limits that can be applied to assess the potential for damaging a structure vary by researcher. The damage criteria presented in Table 3 include several categories for ancient, fragile, and historic structures, the types of structures most at risk to damage. Most buildings are included within the categories ranging from “Historic and some old buildings” to “Modern industrial/commercial buildings”. Construction-induced vibration that can be detrimental to the building is very rare and has only been observed in instances where the structure is at a high state of disrepair and the construction activity occurs immediately adjacent to the structure.

The annoyance levels shown in Table 3 should be interpreted with care since vibration may be found to be annoying at lower levels than those shown, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage.

TABLE 1 Definition of Acoustical Terms Used in this Report

Term	Definition
Decibel, dB	A unit describing, the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20 micro Pascals.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micro Pascals (or 20 micro Newtons per square meter), where 1 Pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g., 20 micro Pascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and Ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day/Night Noise Level, L_{dn} or DNL	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 p.m. and 7:00 a.m.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 p.m.to 10:00 p.m. and after addition of 10 decibels to sound levels measured in the night between 10:00 p.m. and 7:00 a.m.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Source: Handbook of Acoustical Measurements and Noise Control, Harris, 1998.

TABLE 2 Typical Noise Levels in the Environment

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110 dBA	Rock band
Jet fly-over at 1,000 feet		
	100 dBA	
Gas lawn mower at 3 feet		
	90 dBA	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	80 dBA	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	70 dBA	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	60 dBA	
		Large business office
Quiet urban daytime	50 dBA	Dishwasher in next room
Quiet urban nighttime	40 dBA	Theater, large conference room
Quiet suburban nighttime		
	30 dBA	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	20 dBA	
		Broadcast/recording studio
	10 dBA	
	0 dBA	

Source: Technical Noise Supplement (TeNS), California Department of Transportation, September 2013.

TABLE 3 Reactions of People and Damage to Buildings from Continuous or Frequent Intermittent Vibration Levels

Velocity Level, PPV (in/sec)	Human Reaction	Effect on Buildings
0.01	Barely perceptible	No effect
0.04	Distinctly perceptible	Vibration unlikely to cause damage of any type to any structure
0.08	Distinctly perceptible to strongly perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
0.1	Strongly perceptible	Virtually no risk of damage to normal buildings
0.25	Strongly perceptible to severe	Threshold at which there is a risk of damage to historic and some old buildings.
0.3	Strongly perceptible to severe	Threshold at which there is a risk of damage to older residential dwellings such as plastered walls or ceilings
0.5	Severe - Vibrations considered unpleasant	Threshold at which there is a risk of damage to newer residential structures

Source: Transportation and Construction Vibration Guidance Manual, California Department of Transportation, September 2013.

Regulatory Background

The State of California and Contra Costa County have established regulatory criteria that are applicable in this assessment. The CEQA Guidelines, Appendix G, are used to assess the potential significance of impacts pursuant to local General Plan policies, Municipal Code standards, or the applicable standards of other agencies. A summary of the applicable regulatory criteria is provided below.

State CEQA Guidelines. CEQA contains guidelines to evaluate the significance of effects of environmental noise attributable to a proposed project. Under CEQA, construction-related noise or vibration impacts would be considered significant if the project would result in:

(a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local General Plan or Noise Ordinance, or applicable standards of other agencies; or

(b) Generation of excessive groundborne vibration or groundborne noise levels.

Contra Costa County General Plan. The Noise Element in the Contra Costa County 2020 General Plan contains the following noise goals and policies applicable to the Project:

11.8 Goals

11-A: To improve the overall environment in the County by reducing annoying and physically harmful levels of noise for existing and future residents and for all land uses.

11-B: To maintain appropriate noise conditions in all areas of the County.

11-C: To ensure that new developments will be constructed so as to limit the effects of exterior noise on the residents.

11.9 Policies

11-8: Construction activities shall be concentrated during the hours of the day that are not noise-sensitive for adjacent land uses and should be commissioned to occur during normal work hours of the day to provide relative quiet during the more sensitive evening and early morning periods.

11.10 Implementation Measures: Development Review

11-a Continue to require a review and analysis of noise-related impacts as part of the existing project development review procedures of the County.

11-b Evaluate the noise impacts of a proposed project upon existing land uses in terms of the applicable Federal, State, and local codes, and the potential for adverse community response, based on a significant increase in existing noise levels.

11-c Encourage use of the following mitigation measures to minimize noise impacts of proposed development projects:

4) Construction modifications: If site planning, architectural layout, noise barriers, or a combination of these measures does not achieve the required noise reduction, then construction modification to walls, roofs, ceilings, doors, windows, and other penetrations may be necessary.

Contra Costa County Municipal Code. The Contra Costa County Municipal Code contains the following regulations that are applicable to the Project:

> *716-8.1004 – Grading Regulation Work hours.* If operations under the permit are within five hundred feet (152.4 meters) of residential or commercial occupancies, except as otherwise provided by conditions of approval for the project, grading operations shall be limited to weekdays and to the hours, between seven-thirty a.m. and five-thirty p.m., except that maintenance and service work on equipment may be performed at any time.

Existing Noise Environment

The project site is located offshore along the San Joaquin River at 2301 Wilbur Avenue. The existing wharf is surrounded by industrial and commercial facilities to the west, east and south, and the San Joaquin River to the north. The Gaylord Sports Fields and Antioch Youth Sports Complex are located 2,300 feet to the southwest. Single family residential units are located 2,600 feet to the southwest and 1,850 feet to the southeast. The Sardis Unit of the Antioch Dunes National Wildlife Refuge is located approximately 1,400 feet to the west.

The noise environment at the site and in the surrounding areas results primarily from industrial activity of adjacent properties on shore and vessel traffic along the San Joaquin River. Local vehicle traffic along Wilbur Avenue and SR 160, and occasional railroad traffic would also contribute to the existing noise environment.

NOISE IMPACTS AND MITIGATION MEASURES

This section describes the significance criteria used to evaluate construction-related impacts under CEQA and provides a discussion of each project impact. Significant impacts are not expected as a result of the project; therefore, mitigation measures are not proposed.

Significance Criteria

The following criteria were used to evaluate the significance of environmental noise and vibration resulting from the project:

1. **Temporary Noise Increases in Excess of Established Standards.** A significant impact would be identified if project construction would result in a substantial temporary increase in ambient noise levels at sensitive receivers in excess of the local noise standards contained in the Contra Costa County General Plan or Municipal Code. A significant temporary noise impact would be identified if construction would occur outside of the hours specified in the Municipal Code or if construction-related noise would result in hourly average noise levels exceeding 60 dBA L_{eq} at the property lines shared with residential land uses, and the ambient by at least 5 dBA L_{eq}, for a period of more than one year.

2. **Generation of Excessive Groundborne Vibration.** A significant impact would be identified if the construction of the project would generate excessive vibration levels. Groundborne vibration levels exceeding 0.3 in/sec PPV would be considered excessive as such levels would have the potential to result in cosmetic damage to buildings.

Impact 1: **Temporary Noise Increases in Excess of Established Standards.** Temporary construction activities would not result in a substantial noise level increase or expose existing noise-sensitive land uses to noise levels in excess of the applicable noise thresholds. **This is a less-than-significant impact.**

Neither Contra Costa County nor the State of California specify quantitative thresholds for the impact of temporary increases in noise due to construction. As discussed in the Setting section of this report, the threshold for speech interference indoors is 45 dBA. Assuming a 15 dBA exterior-to-interior reduction for standard residential construction and a 25 dBA exterior-to-interior reduction for standard commercial construction, this would correlate to an exterior threshold of 60 dBA L_{eq} at residential land uses. Additionally, temporary construction would be annoying to surrounding land uses if the ambient noise environment increased by at least 5 dBA L_{eq} for an extended period of time. Therefore, the temporary construction noise impact would be considered significant if project construction activities exceeded 60 dBA L_{eq} at nearby residences and exceeded the ambient noise environment by 5 dBA L_{eq} or more for a period longer than one year.

Construction activities will include structural and operational safety repairs and improvements, demolition of structures without replacement, demolition and replacement of existing structures, and new construction and repairs. The proposed project would include construction with crane barges, material barges, tugboats, vibratory hammers, and impact hammers. A vibratory hammer would be used for both removal and installation of piles, whereas the impact hammer would be used only to drive concrete piles and complete the installation of new steel piles after the vibratory hammers has driven piles to refusal.

Construction equipment noise varies greatly depending on the construction activity performed, type and specific model of equipment, and the condition of equipment used. Typical noise levels for different construction equipment at a distance of 50 feet are shown in Table 4. Table 4 levels are consistent with construction noise levels calculated for the project in the Federal Highway Administration Roadway Construction Noise Model (RCNM), including the anticipated equipment that would be used for each phase of the project. Most demolition and construction noise ranges from 80 to 90 dBA at 50 feet from the source. Construction-generated noise levels drop off at a rate of about 6 dBA per doubling of the distance between the source and receptor. Shielding by buildings or terrain can provide an additional 5 to 10 dBA noise reduction at distant receptors, however, the effects of intervening shielding were not accounted for in the calculations.

Noise impacts resulting from construction depend on the noise generated by various pieces of construction equipment, the timing and duration of noise-generating activities, the distance between construction noise sources and noise-sensitive receptors, any shielding provided by intervening structures or terrain, and ambient noise levels. Construction noise impacts primarily result when construction activities occur during noise-sensitive times of the day (early morning, evening, or nighttime hours), when construction occurs in areas immediately adjoining noise-sensitive land uses, or when construction durations last over extended periods of time.

Construction activities would include demolition, site preparation, grading and excavation, trenching and foundation, building with a vibratory pile driver, building with an impact pile driver, architectural coating, and paving. The in-water work is expected to start July 1, 2019 and is expected to be completed by December 2019. All work would occur between 7:00am and 6:00pm on weekdays and between 9:00am and 5:00pm on weekends and holidays. Work on structures raised above the water may occur outside of this window, supported by construction barges as-needed.

For each phase, the equipment is summarized in Table 5 in hourly average noise levels. Noise levels are reported at a reference distance of 50 feet, as well as at distances to the nearest receptors. The hourly average noise level is calculated by an energy summation of the hourly average noise levels for each piece of equipment. Therefore, with more equipment operating simultaneously, the combined hourly average noise level may be greater than the maximum instantaneous noise level. The noise levels summarized in Table 5 during each phase would occur over a span of four acres in size, including the wharf itself, surrounding waters, and portions of the adjacent shoreline. Assuming worst-case scenario conditions, where each piece of equipment listed in Table 5 (per phase) would operate simultaneously, the estimated noise levels at 50 feet propagated from the edge of the construction site to the nearest property lines of the surrounding noise-sensitive receptors.

Based on the results of Table 5, the nearest noise-sensitive receptors would be exposed to temporary construction noise in excess of 60 dBA L_{eq} only during pile driving. Since total project construction is expected to last for a period of approximately six months, the temporary noise increase would be considered **less-than-significant**.

TABLE 4 Construction Equipment, 50-foot Noise Emission Limits

Equipment Category	L_{max} Level (dBA)[1,2]	Impact/Continuous
Arc Welder	73	Continuous
Auger Drill Rig	85	Continuous
Backhoe	80	Continuous
Bar Bender	80	Continuous
Boring Jack Power Unit	80	Continuous
Chain Saw	85	Continuous
Compressor[3]	70	Continuous
Compressor (other)	80	Continuous
Concrete Mixer	85	Continuous
Concrete Pump	82	Continuous
Concrete Saw	90	Continuous
Concrete Vibrator	80	Continuous
Crane	85	Continuous
Dozer	85	Continuous
Excavator	85	Continuous
Front End Loader	80	Continuous
Generator	82	Continuous
Generator (25 KVA or less)	70	Continuous
Gradall	85	Continuous
Grader	85	Continuous
Grinder Saw	85	Continuous
Horizontal Boring Hydro Jack	80	Continuous
Hydra Break Ram	90	Impact
Impact Pile Driver	105	Impact
Insitu Soil Sampling Rig	84	Continuous
Jackhammer	85	Impact
Mounted Impact Hammer (hoe ram)	90	Impact
Paver	85	Continuous
Pneumatic Tools	85	Continuous
Pumps	77	Continuous
Rock Drill	85	Continuous
Scraper	85	Continuous
Slurry Trenching Machine	82	Continuous
Soil Mix Drill Rig	80	Continuous
Street Sweeper	80	Continuous
Tractor	84	Continuous
Truck (dump, delivery)	84	Continuous
Vacuum Excavator Truck (vac-truck)	85	Continuous
Vibratory Compactor	80	Continuous
Vibratory Pile Driver	95	Continuous
All other equipment with engines larger than 5 HP	85	Continuous

Notes: [1] Measured at 50 feet from the construction equipment, with a "slow" (1 sec.) time constant.
[2] Noise limits apply to total noise emitted from equipment and associated components operating at full power while engaged in its intended operation.
[3]Portable Air Compressor rated at 75 cfm or greater and that operates at greater than 50 psi.

TABLE 5 Summary of Construction Noise Levels at the Nearest Receptors

Phase	Estimated Noise Levels at Nearby Land Uses, dBA L_{eq}			
	Reference Level (50 ft)	Southeast Residential Receptor (1,850 ft)	Southwest Sports Fields (2,300 ft)	Southwest Residential Receptor (2,600 ft)
Demolition	85	54	52	51
Site Preparation	83	52	50	49
Grading/ Excavation	84	53	51	50
Trenching/ Foundation	77	46	44	43
Building – Vibratory Pile Driving	94	**63**	**61**	**60**
Building – Impact Pile Driving	95	**64**	**62**	**61**
Building – Architectural Coating	75	44	42	41
Paving	81	50	48	47

Mitigation Measure 1: None required.

Impact 2: Exposure to Excessive Groundborne Vibration. Construction-related vibration levels would not exceed 0.3 in/sec PPV at the nearest structures. **This is a less-than-significant impact.**

For structural damage, the California Department of Transportation recommends a vibration limit of 0.5 in/sec PPV for buildings structurally sound and designed to modern engineering standards, 0.3 in/sec PPV for buildings that are found to be structurally sound but where structural damage is a major concern, and a conservative limit of 0.25 in/sec PPV for historic and some old buildings (see Table 3). The 0.3 in/sec PPV vibration limit would be applicable to properties in the vicinity of the project site.

Construction activities would include demolition of existing structures, replacement of existing structures, and new construction and repairs. Table 6 presents typical vibration levels that could be expected from construction equipment at a distance of 25 feet. Project construction activities may generate substantial vibration in the immediate vicinity of work areas, but vibration levels would vary at off-site receptor locations depending on distance from the source of the vibration, soil conditions, construction methods, and equipment used.

The nearest off-site structures are located 1,260 feet to the south and 1,865 feet to the southeast of the intersection of the wharf and the shoreline. At this distance, vibration levels would be barely perceptible (0.015 in/sec PPV or less) and would not have an effect on building structure.

TABLE 6 Vibration Source Levels for Construction Equipment

Equipment		PPV at 25 ft. (in/sec)	PPV at 1,260 ft. (in/sec)	PPV at 1,865 ft. (in/sec)
Pile Driver (Impact)	upper range	1.158	0.015	0.010
	typical	0.644	0.009	0.006
Pile Driver (Sonic)	upper range	0.734	0.010	0.006
	typical	0.170	0.002	0.001
Clam shovel drop		0.202	0.003	0.002
Hydromill (slurry wall)	in soil	0.008	0.000	0.000
	in rock	0.017	0.000	0.000
Vibratory Roller		0.210	0.003	0.002
Hoe Ram		0.089	0.001	0.001
Large bulldozer		0.089	0.001	0.001
Caisson drilling		0.089	0.001	0.001
Loaded trucks		0.076	0.001	0.001
Jackhammer		0.035	0.000	0.000
Small bulldozer		0.003	0.000	0.000

Source: Transit Noise and Vibration Impact Assessment, United States Department of Transportation, Office of Planning and Environment, Federal Transit Administration, May 2006 and modified by Illingworth & Rodkin, Inc., May 2019.

Mitigation Measure 2: None required.

APPENDIX F

Stantec

Memo

To:	Alex Morris City of Antioch	From:	Daryl Zerfass and Maria Morris Stantec
File:	185705365	Date:	May 7, 2021

Reference: AMPORTS Antioch Vehicle Processing Facility Project LOS Traffic Analysis Screening and VMT Analysis Screening

Stantec Consulting Service Inc. (Stantec) has prepared the following screening memo for the AMPORTS Antioch Vehicle Processing Facility (Project) located on 2301 Wilbur Avenue in the City of Antioch, California. The Project proposes to construct an automotive logistics and processing facility on a 38.9-acre site. This memo summarizes the findings of a traffic analysis screening and a VMT analysis screening.

Project Description

The Project site will be used for delivery and storage of vehicles and limited processing prior to distribution to dealerships. The improved site will include conversion and upgrade of the existing wharf to support roll-on/roll-off (RORO) operations, a one-story vehicle processing building with offices, as well as grading, fencing, paving, and striping for car storage and loading prior to distribution. The vehicle processing building is approximately 25,328 square feet (s.f.). There is an existing 5,000 s.f. storage building and existing guard house, which will both remain.

The site was the previous location of the Gaylord Paper Mill. The project site is surrounded by State Route 4 to the east, residential development to the west, and Wild Horse Road, the Contra Costa Water District's Pumping Plant 4, and the Contra Costa Canal to the south. **Figure 1** shows the Project Location Map. **Figure 2** shows the Project's Site Plan.

Methodology

Level of Service (LOS) Traffic Analysis Project Screening

The City of Antioch requires that a LOS traffic analysis be conducted for projects adding 50 or more peak hour trips to an intersection. The Project's trip generation is estimated using a combination of the Project's anticipated number of employees, number of trucks, as well as by using trip rates from the Institute of Transportation Engineers (ITE) trip generation handbook. If the Project is found to add more than 50 peak hour trips to an intersection, a LOS traffic analysis is typically required.

VMT Impact Analysis Project Screening

The VMT analysis screening presented below complies with the updated California Environmental Quality Act (CEQA) guidelines that incorporates the requirements of Senate Bill 743 (SB 743). Generally, SB 743 moves away from using delay-based level of service (LOS) as the metric for identifying a project's significant impact to instead use VMT.

SB 743 requires the Governor's Office of Planning and Research (OPR) to establish recommendations for identifying and mitigating transportation impacts within CEQA, the document is referred to in this memorandum as OPR's Technical Advisory[1]. OPR's Technical Advisory recommends methodologies for quantifying VMT, significance thresholds for identifying a transportation impact, and screening criteria to quickly identify if a Project can be presumed to have a less than significant impact without conducting a full VMT analysis. Lead agencies are to adopt local guidelines appropriate for their jurisdiction. At this time, the City of Antioch has not formally adopted VMT guidelines. In July 2020, the Contra Costa Transportation Authority (CCTA) released a draft VMT Analysis Methodology for Land Use Project in Contra Costa[2] but is currently in the process of developing VMT guidance. Therefore, this VMT analysis has been prepared in accordance with OPR's Technical Advisory guidance and CCTA's draft methodology.

LOS Traffic Analysis – Project Screening

The Project's trip generation is estimated using a combination of Project specific information that includes the anticipated number of employees, employee work shifts, occasional crew of stevedores, number of trucks, hours of operation, as well as by using trip rates from the ITE trip generation handbook.

Employees, Hours of Operation and Trip Generation

Table 1 summarizes the anticipated number of employee and hours of operations for the Project.

Table 1 Project Employee and Truck Hours of Operations

Description	Typical Daily Amount	Non-Typical (Vessel Arrival[1]) Amount
Employees		
Number of Employees	30	65
Number of Employee Shifts	1	1
Time of Employee Shift	7:00 AM - 3:30 PM	7:00/9:00[2] AM – 3:00[2]/3:30 PM
Days of Operations	Monday - Friday	Monday - Friday (when needed)
Trucks		
Number of Truck Trips per Year	3,000 - 3,800	nc
Number of Trucks per Day	10-12 (Average) 18 (Worst Case)	nc
Time of Truck Operations	8:00 AM to 4:00 PM	nc
Truck Operations	Monday - Friday	nc
[1] Vessel arrivals are anticipated up to 25 times a year [2] Stevedore shift begins at 9:00 AM and ends at 3:00 PM nc = no change		

The Project would result in 30 full time employees, at the Project site on a typical day. For full time employees, there is anticipated to be one employee shift that starts at 7:00AM and ends at 3:30PM, Monday

[1] Technical Advisory on Evaluating Transportation Impacts in CEQA, Governor's Office of Planning and Research, State of California, December 2018.
[2] VMT Analysis Methodology for Land Use Projects in Contra Costa, Growth Management Task Force Review Draft, Contra Costa Transportation Authority, July 9, 2020.

Reference: AMPORTS Antioch Vehicle Processing Facility Project LOS Traffic Analysis Screening and VMT Analysis Screening

through Friday. For this analysis, approximately 75 percent of the employees are estimated to arrive on site prior to the start of the 7:00 AM shift, with the remainder conservatively estimated to arrive during the AM roadway peak hour (generally occurring between 7:00 AM and 9:00 AM). Similarly, approximately 75 percent of the employees are estimated to exit the site at the end of the 3:30 PM shift, with the remainder conservatively estimated to leave during the PM roadway peak hour (generally occurring between 4:00 PM and 6:00 PM). Weekend work is not anticipated in the normal course of business. In regard to truck activity on a typical day, the Project applicant reports that that 3,000 to 3,800 truck trips per year will occur. Trucks will be used to transport vehicles to other locations. Operations are anticipated to include on average 10 to 12 per day, but this study uses an estimated worst case of 18 to account for fluctuations, between the hours of 8:00 AM to 4:00 PM, Monday through Friday. Trucks will arrive and depart the site on the same day. Approximately one-third of the daily truck activity is conservatively estimated to occur during the morning roadway peak hour and again during the evening roadway peak hour.

In addition to employee and truck activity, additional trips would occur during the day for various purposes, such as deliveries and visitors. The number of visitor and delivery trips are estimated based on the size of the proposed new processing building (25,328 s.f.) based on typical warehouse ITE trip generation rates. Approximately 4 trips would occur during the AM peak hour of the adjacent roadway (typically one hour between 7:00 AM and 9:00 AM), 5 trips would occur during the PM peak hour of the adjacent roadway (typically one hour between 4:00 PM and 6:00 PM), and there would be 44 average daily trips (ADT).

On a non-typical day when vessels arrive at port (up to 25 times a year), a crew of stevedores (approximately 35 stevedores) would be on-site to unload the vessel. The crew is usually transported by vanpool, but on occasion may arrive in separate vehicles. For a conservative worse-case scenario, this analysis assumes that the crew will arrive in separate vehicles. The stevedores would start their shift around 9:00 AM and end their shift around 3:00 PM. For this analysis, approximately 75 percent of the stevedores are estimated to arrive on site prior to the start of the 9:00 AM shift, with the remainder conservatively estimated to arrive after 9:00 AM. Similarly, approximately 75 percent of the stevedores are estimated to exit the site at the end of the 3:00 PM shift, with the remainder conservatively estimated to leave before 3:00 PM. On these non-typical days, it is estimated that up to 65 total employees (full-time employees and crew of stevedores) will be onsite.

Based on the above employee and hours of operation information, the estimated Project trip generation for a typical day and a non-typical day are summarized in **Table 2**.

Table 2 Trip Generation Summary

	AM Project Peak Hour (6:00AM-7:00AM)			AM Roadway Peak Hour			PM Project Peak Hour (3:00-4:00PM)			PM Roadway Peak Hour			ADT
Description	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**	
Trip Rate													
Warehousing (ITE 150)[1]	na	na	na	0.13	0.04	0.17	na	na	na	0.05	0.14	0.19	1.74
Trip Generation													
FT Employees vehicles[2]	22	0	22	8	0	8	0	22	22	0	8	8	74[4]
Trucks[2]	0	0	0	6	1	7	0	3	3	0	6	6	36
Visitors/ Deliveries[1,3]	0	0	0	3	1	4	2	2	4	1	4	5	44
Total Typical Day	**22**	**0**	**22**	**17**	**2**	**19**	**2**	**27**	**29**	**1**	**18**	**19**	**154**

Stevedores[2,5] (occasional)	0	0	0	26	0	26	0	26	26	0	0	0	86[4]
Total Non-Typical Day[5]	**22**	**0**	**22**	**43**	**2**	**45**	**2**	**53**	**55**	**1**	**18**	**19**	**240**

na = not available, Project trips estimated for these time periods based on expected operations
FT = full-time
[1] Warehouse (ITE 150) trip rate used to estimate ancillary site visitors and deliveries not related to heavy truck operations
[2] Based on number of employees, employee shift, and truck operations
[3] Based on 25.328 TSF new processing building
[4] Based on ITE (140) Manufacturing trip rate of 2.47 per employee
[5] Note that the crew of stevedores are usually transported to the site via vanpool. However, trips shown here assume a worse-case scenario where the crew of stevedores drive to project site separately.

On a typical day, the Project's AM peak hour would occur between 6:00 AM and 7:00 AM when most employees would be arriving at the Project site in their personal vehicle. The Project's PM peak hour would occur between 3:00PM and 4:00PM when most employees would leave the Project site in their personal vehicles. There would be a nominal volume of trips that occur in the AM and PM peak hours of the adjacent roadways when off-site traffic impacts would generally occur. Specifically, as shown in **Table 2**, approximately 19 Project trips are anticipated for the peak hour of the adjacent roadways. Overall, there would be 154 daily trips generated by the Project for a typical weekday. Since the Project will not add 50 or more peak hour trips to an intersection, a LOS traffic analysis is not required.

On a non-typical day when a crew of stevedores are utilized to help unload a vessel, the AM Project peak hour (22 trips) would remain the same, but the project trips in the AM peak hour of adjacent roadways would increase to 45. The PM Project peak hour would increase to from 29 up to 53 trips. The project trips in the PM peak hour of adjacent roadways would remain the same as a typical day (19 trips). Since the Project's trips would be distributed to the adjacent roadways, where some vehicles are coming to/going to the east and some are coming to/going to the west, the project would not add 50 or more peak hour trips to an off-site intersection. In addition, the applicant has indicated that the crew is usually transported in via vanpool, therefore, trips would be reduced to below 50 trips. Therefore, a LOS traffic analysis is not required.

VMT Impact Analysis – Project Screening

Prior to undertaking a project-level VMT analysis, OPR's Technical Advisory and CCTA's draft methodology recommends applying a screening criteria. If a project satisfies one or more of the screening criteria, the Project could be presumed to have a less-than-significant impact. There are five screening criteria as shown in **Table 3**.

Table 3 Project Screening Criteria and Threshold

Category	Criteria/Screening	Threshold	Applicable to Project
CEQA Exemption	Any project that is exempt from CEQA is not required to conduct a VMT analysis.	None	No
Small Project	Small Projects can be screened out from completing a full VMT analysis.	If the Project generates less than 110 trips per day, the Project is assumed to have a less than significant impact.	No

		Projects of 10,000 square feet or less of non-residential space or 20 residential units or less, or otherwise generating less than 836 VMT per day.	
Local-Serving Uses	Projects that consist of Local-Serving uses can be screened out from completing a full VMT analysis.	Local serving retail of less than 50,000 square feet may also be presumed to have a less than significant impact.	No
Transit Priority Area Screening	Projects within ½ mile of a major transit stop or a stop located along a high-quality transit corridor generally reduce VMT and therefore can be screened out from completing a full VMT analysis.	If the Project is within ½ mile of a major or high-quality transit stop/corridor, the Project is assumed to have a less than significant impact. The project should generally also meet the following criteria: - FAR > 0.75 - Not provide more parking than required by City - Be consistent with the regional SCS - Does not result in a net reduction in multi-family housing units - Not replace existing affordable units with a smaller number of moderate to high-income units	No
Low VMT Area Screening	Residential and employment-generating projects that are located in areas with low VMT and that are similar in character to the existing development can be screened out from completing a full VMT analysis.	If the Project is in a low VMT area the Project is assumed to have a less than significant impact. The CCTA draft methodology defines low VMT area as: - For housing projects: Cities and unincorporated portions within CCTA's five subregions that have existing home-based VMT (HBVMT) per capita that is 85% or less of the existing county-wide average - For employment-generating projects: Cities and unincorporated portions within CCTA's five subregions that have existing home-based work VMT (HBWVMT) per worker that is 85% or less of the existing regional average (regional is defined as Bay-Area)	Yes
FAR = Floor Area Ratio SCS = Sustainable Community Strategy Sources: OPR's Technical Advisory and CCTA draft methodology			

Low VMT Area Screening

As previously shown in **Table 3**, employment-generating projects located within a low VMT generating area can be presumed to have a less-than-significant impact. VMT screening maps prepared by CCTA for this purpose are utilized here. Traffic analysis zone (TAZ) level VMT estimates were also obtained from CCTA.

Two methods are presented here. The first method uses TAZ level VMT estimates and is compared to the Contra Costa County regional level, which is the City's preferred approach. The second method uses Citywide level VMT estimates and is compared to the Bay Area regional level, which is CCTA's recommended approach. CCTA recommends that for the analysis of employment-generating projects, the cities and unincorporated portions of CCTA's five subregions with existing home-based work VMT (HBWVMT) per worker that is 15% below the existing regional average are presumed to have a less-than-significant impact for any development within those areas[3]. According to CCTA, development projects may assume that the project's VMT output will be similar in nature to the existing Citywide average HBWVMT VMT per worker[4]. CCTA defines the regional area as the Bay Area region.

The Project is located in TAZ 30149. The Project is similar to the existing uses in the area; therefore, it is appropriate to assume that the Project would exhibit similar trip characteristics as exhibited by the existing TAZ. **Table 4** summarizes the average HBWVMT per worker for TAZ 30149 and the average HBWVMT per worker for Contra Costa County. **Table 4** also shows the City of Antioch and the average HBWVMT per worker for the Bay Area region.

Table 4 Low VMT Area Summary

Analysis Metrics: Employment-Generating	**VMT**
Method 1	
Project TAZ 30149 HBWVMT per Worker	10.8
Contra Costa County Average HBWVMT per Worker	14.9
Contra Costa County Average HBWVMT per Worker minus 15%	12.7
Is Project TAZ above or below the regional average minus 15%?	Below
Is Project in a low VMT area?	Yes
Method 2	
Citywide Average HBWVMT per Worker	10.9
Bay Area Average HBWVMT per Worker	15.6
Bay Area Average HBWVMT Worker minus 15%	13.2
Is Citywide average above or below the regional average minus 15%?	Below
Is Project in a low VMT area?	Yes
Source: Contra Costa Transportation Authority staff email correspondence "Request for Contra Costa Travel Demand Model VMT Data" on 4/8/21	

As shown in **Table 4**, the Project TAZ HBWVMT per worker is 10.8 and the Countywide average HBWVMT per worker with a 15 percent reduction is 12.7. Therefore, the Project is below the significance threshold and would not have a significant impact on VMT. Per CCTA methodology, the Citywide average HBWVMT per worker of 10.9 is below the regional average HBWVMT per worker significance threshold of 13.2. Therefore, the Project is in one of CCTA's cities that is considered a "low VMT area" and the Project is presumed to have a less than significant impact on VMT.

Cumulative VMT Analysis Screening

The City's General Plan last underwent a comprehensive update in 2003, with an update to the Land Use Element in 2017. The Project site is zoned for M-2 Heavy Industrial District and is shown in the City's General Plan as within the Eastern Waterfront Employment Focus Area. The Project land use is consistent with the City of Antioch General Plan. Since the Project is consistent with the City's General Plan, the Project would

[3] Page 8 from VMT Analysis Methodology for Land Use Projects in Contra Costa, Growth Management Task Force Review Draft, Contra Costa Transportation Authority, July 9, 2020
[4] Email correspondence with CCTA staff dated 4/8/2021.

also be consistent with the Plan Bay Area 2040, the long-range Regional Transportation Plan and Sustainable Communities Strategy (RTP/SCS) for the San Francisco Bay Area.

According to OPR's Technical Advisory[5] and the CCTA's draft methodology[6], when a project has a less than significant impact at the project level, the project would not have a cumulative impact. Since the Project was found to have a less than significant impact using the low VMT area screening criteria, the Project would also have a less than significant cumulative impact.

Active Transportation

The Project site is in an industrial part of the City. Currently, there are no sidewalks on both sides of Wilbur Avenue, except for a short half mile segment on the north side of Wilbur Avenue east of the Project site. Pedestrians walking on Wilbur Avenue would utilize the wide shoulders. There are no designated bicycle facilities around the Project site. The Project will not block, remove, or create barriers for walking and biking.

Transit

The Eastern Contra Costa Transit Authority (ECCTA) operates fixed-route and paratransit service under Tri Delta Transit and contracts with First Transit for the operation of buses. Tri Delta provides transit service near the Project site. The nearest bus stop is located near the corner of Veira and 18th street, approximately over a half a mile away. The bus stop provides service to for routes 383, 391, and 393. Route 303 provides weekday service from Blue Goose Park to Antioch BART. Route 391 provides weekday service from Brentwood Park & Ride to Pittsburg Center Station. Lastly, Route 393 provides service weekend service from Brentwood Park & Ride to Antioch BART. The Project would not block, remove, or create barriers for transit utilization.

Conclusion

A LOS traffic analysis screening and a VMT analysis screening was conducted for the Project.

On a typical day, approximately 19 Project generated trips are anticipated to occur during the peak hour of the adjacent roadways. The Project would generate the most traffic outside of the typical roadway peak hours. In the AM from 6:00 AM to 7:00 AM, the Project would generate approximately 22 peak hour trips when most employees would be arriving at the Project site in their personal vehicle. In the PM from 3:00PM to 4:00PM, employees leave in their personal vehicle, along with some truck trips and visitor/delivery trips, generating approximately 29 Project trips. Overall, there would be an estimated 154 daily trips generated by the Project for a typical weekday. Since the Project would not add 50 or more peak hour trips to an intersection, the Project does not meet the requirement for a LOS analysis.

On a non-typical day when a crew of stevedores are utilized to help unload a vessel, project trips in the AM peak hour of adjacent roadways would increase to 45. The PM Project peak hour would increase to from 29 up to 53 trips. Since the Project's trips would be distributed to the adjacent roadways, where some vehicles are coming to/going to the east and some are coming to/going to the west, the Project would not add 50 or more peak hour trips to an off-site intersection. In addition, the applicant has indicated that the crew is usually

---

[5] Page 6 from Technical Advisory on Evaluating Transportation Impacts in CEQA, Governor's Office of Planning and Research, State of California, December 2018.
[6] Page 13 from VMT Analysis Methodology for Land Use Projects in Contra Costa, Growth Management Task Force Review Draft, Contra Costa Transportation Authority, July 9, 2020

Reference: AMPORTS Antioch Vehicle Processing Facility Project LOS Traffic Analysis Screening and VMT Analysis Screening

transported by vanpool, therefore, trips would be reduced to below 50 trips. Therefore, a LOS traffic analysis is not required.

Using guidance from OPR's Technical Advisory,CCTA's draft methodology, and consultation with City staff, a VMT screening analysis was prepared for the Project. The analysis showed that the Project meets the Low VMT Area screening criteria since the Project is in a TAZ area where the HBWVMT per worker is below the Countywide average HBWVMT per worker with a 15% reduction. In addition, per CCTA's methodology, the Citywide HBVMT per worker is below the regional average HBWVMT per worker with a 15% reduction. Therefore, the Project would have a less than significant impact on VMT.

If you have any questions on the above material, please feel free to contact Daryl or Maria to discuss.

Stantec Consulting Services Inc.

Daryl Zerfass PE, PTP
Principal, Transportation Planning & Traffic Engineering
Phone: (949) 923-6058
Daryl.Zerfass @stantec.com

Maria Morris AICP, PTP
Senior Transportation Planner
Phone: (949) 923-6072
Maria.Morris@stantec.com

Attachment: Figure 1 Project Location Map
Figure 2 Project Site Plan

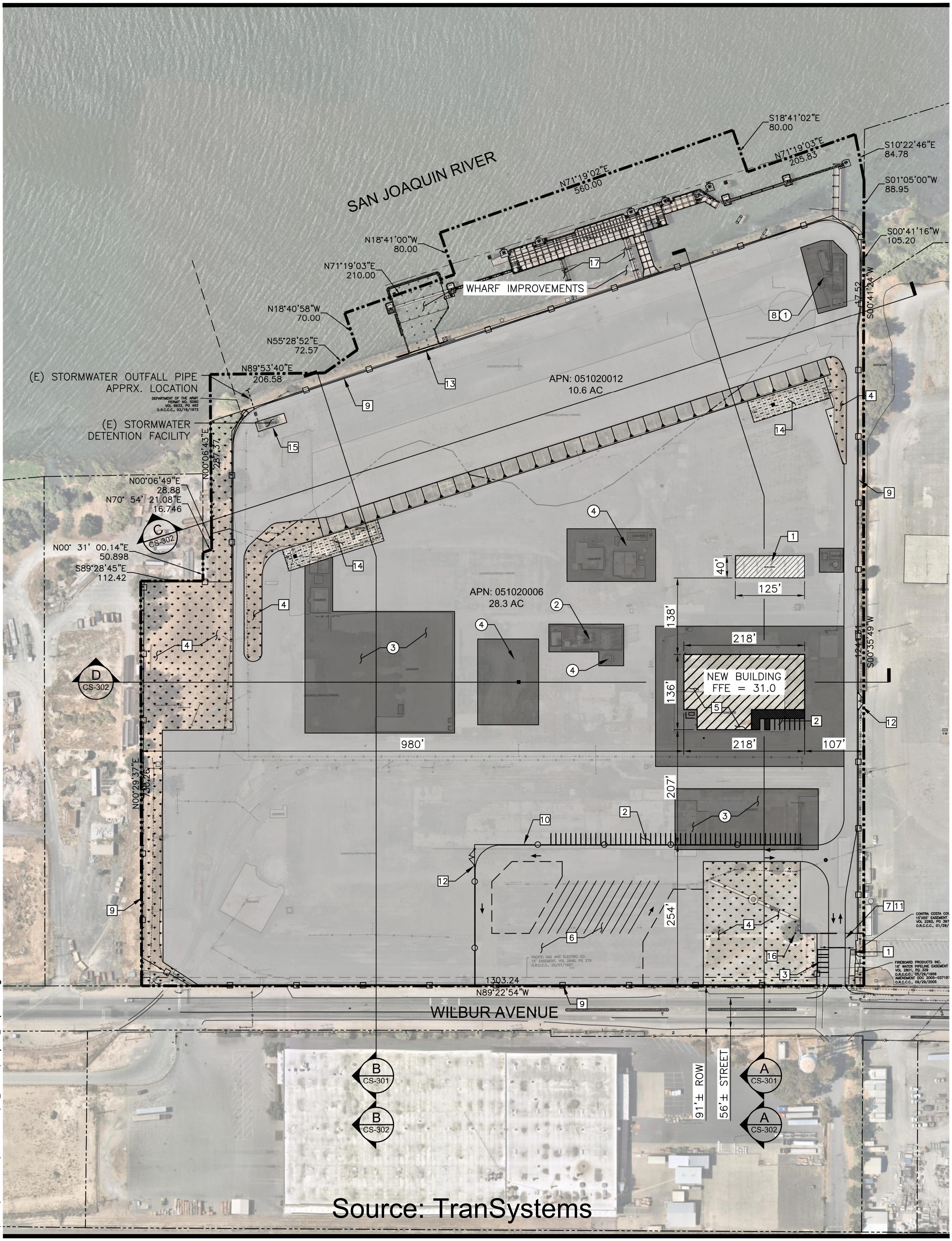
c. file

AMPORTS ANTIOCH VEHICLE PROCESSING FACILITY PROJECT
LOS TRAFFIC ANALYSIS SCREENING AND VMT ANALYSIS SCREENING

N

Figure 1

Project Location Map



c:\users\emazzella\documents\mt_diablo\siteplan_amports.dwg

Figure 2

Project Site Plan

APPENDIX G

JUNE 2019
AMPORTS

REVISED REVIEW OF SEA-LEVEL RISE FOR RORO OPERATIONS AT ANTIOCH BERTH

ADDRESS COWI North America, Inc.
1300 Clay St.
7th Floor
Oakland, CA 94612
USA

TEL +1 510 839 8972
FAX +1 510 839 9715
WWW cowi-na.com

JUNE 2019
AMPORTS

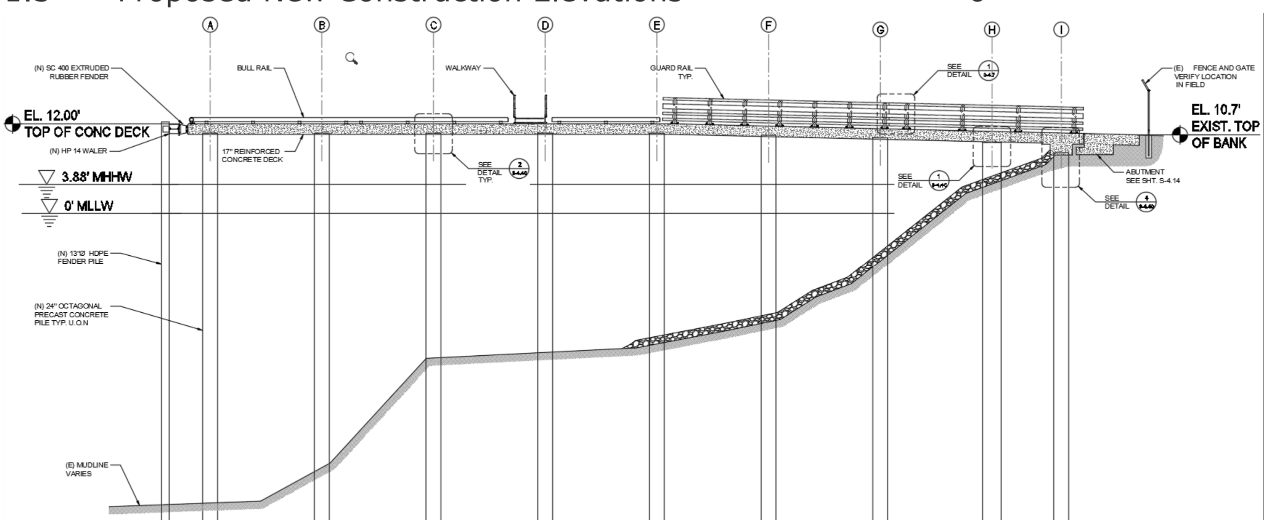
REVISED REVIEW OF SEA-LEVEL RISE FOR RORO OPERATIONS AT ANTIOCH BERTH

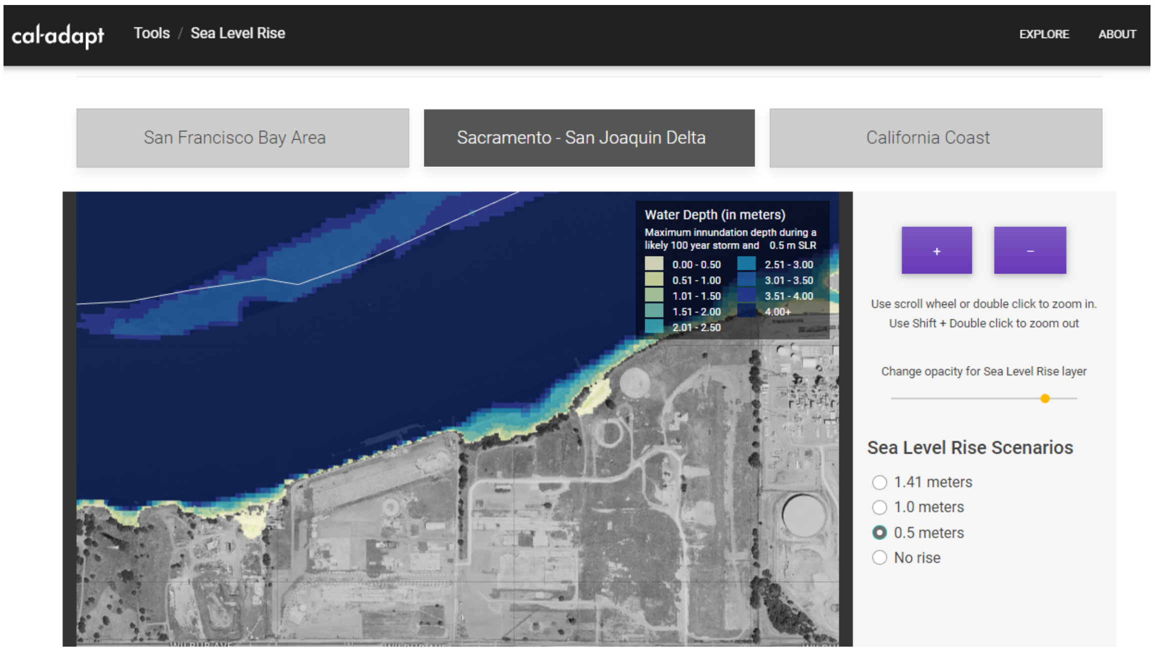
PROJECT NO.	DOCUMENT NO.
A104430	003

VERSION	DATE OF ISSUE	DESCRIPTION	PREPARED	CHECKED	APPROVED
001	June 11, 2019		JWK	JBSW	TWT

CONTENTS

Contents




cal-adapt
Tools / Sea Level Rise
EXPLORE
ABOUT
San Francisco Bay Area
Sacramento - San Joaquin Delta
California Coast
Water Depth (in meters)
Maximum innundation depth during a likely 100 year storm and 0.5 m SLR
0.00 - 0.50
0.51 - 1.00
1.01 - 1.50
1.51 - 2.00
2.01 - 2.50
2.51 - 3.00
3.01 - 3.50
3.51 - 4.00
4.00+
+
−
Use scroll wheel or double click to zoom in.
Use Shift + Double click to zoom out
Change opacity for Sea Level Rise layer
Sea Level Rise Scenarios
1.41 meters
1.0 meters
0.5 meters
No rise

13

1 Sea-Level Rise Review

1.1 Background

This study revisits the issue of Sea-Level Rise at the Antioch berth formerly known as the Gaylord Paper Antioch Marine Terminal, a wood pulp unloading berth located along the south bank of the San Joaquin River in Antioch, CA.

The original wharf was designed in 1955 by Earl and Wright Consulting Engineers for the Crown Zellerbach Corporation and constructed soon after design was complete. The existing deck was redesigned in 1956 following a fire at the wharf. The 1956 design replaced a timber framed deck with concrete beams and slab. The existing elevation of the original wharf is approximately 15.5 ft, MLLW.

A new concrete deck is proposed to be constructed at the site between two existing mooring dolphins. The existing elevations of the original mooring dolphins, to remain, on either side of the new concrete deck were surveyed to be 10.7 ft and 10.8 ft MLLW. An isolated timber pier to the east of the main pier has a deck elevation of 11.0 ft at its northern end. The top of bank inside a curb at the shoreline south of the pier varies from 10.6 ft MLLW to 10.8 ft MLLW.

The anticipated future use is as a car carrier vessel unloading facility to be operated by AMPORTS, Inc. The new use of the dock requires the construction of the new concrete deck to support the car carrier vessels' stern unloading ramps. The new deck elevation is limited to as to accommodate the vessels ramp at low tide. The deck elevation as designed is +12.0' MLLW and slowly ramps down to +10.7' MLLW to match the top of existing bank.

AMPORTS has the option on a 40-year lease at the facility.

No structures will be located on the new deck. The only equipment to be mounted on the new deck is a mooring bollard, guard rails, and a light standard.

1.2 Governing Codes, Standards, and Regulations

The following codes, specifications, regulations and industry standards, where applicable, were and are now being used in the Sea-Level Rise consideration for design.

Original Sea-Level Rise Design Standard:

"State of California Sea-Level Rise Interim Guidance Document" (2009), developed by the Sea-Level Rise Task Force of the Coastal and Ocean Working Group of the California Climate Action Team (CO-CAT)

New Sea Level Rise Design Standard:

State of California Sea-Level Rise Guidance (updated 2018), developed by California Natural Resources Agency and California Ocean Protection Council (Guidance)

1.3 Proposed New Construction Elevations

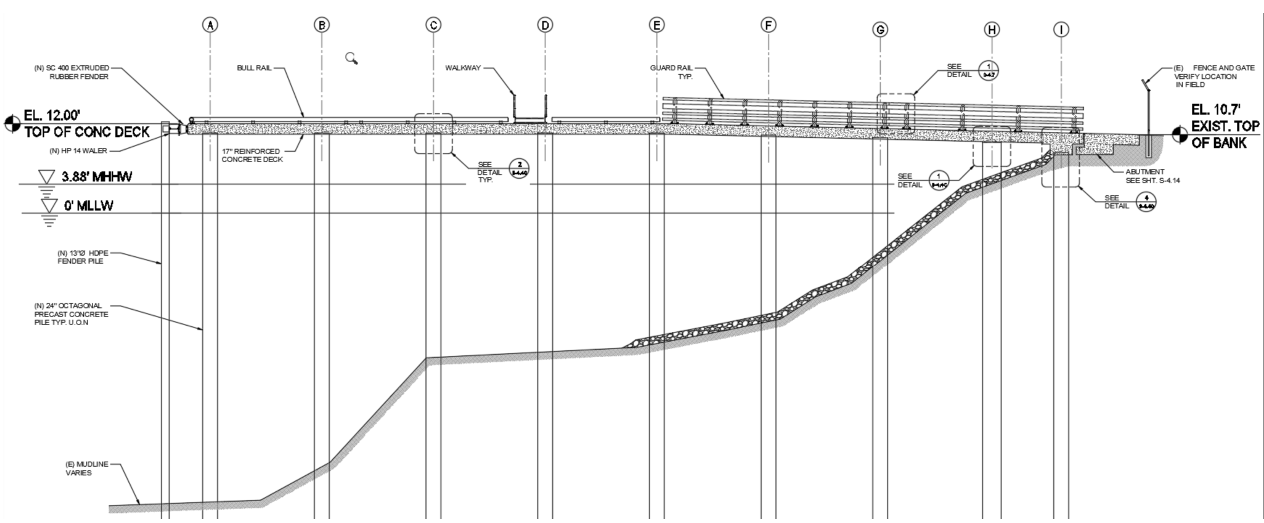


Figure 1 New Construction Elevations

1.4 Mean Sea-Level Change Estimates

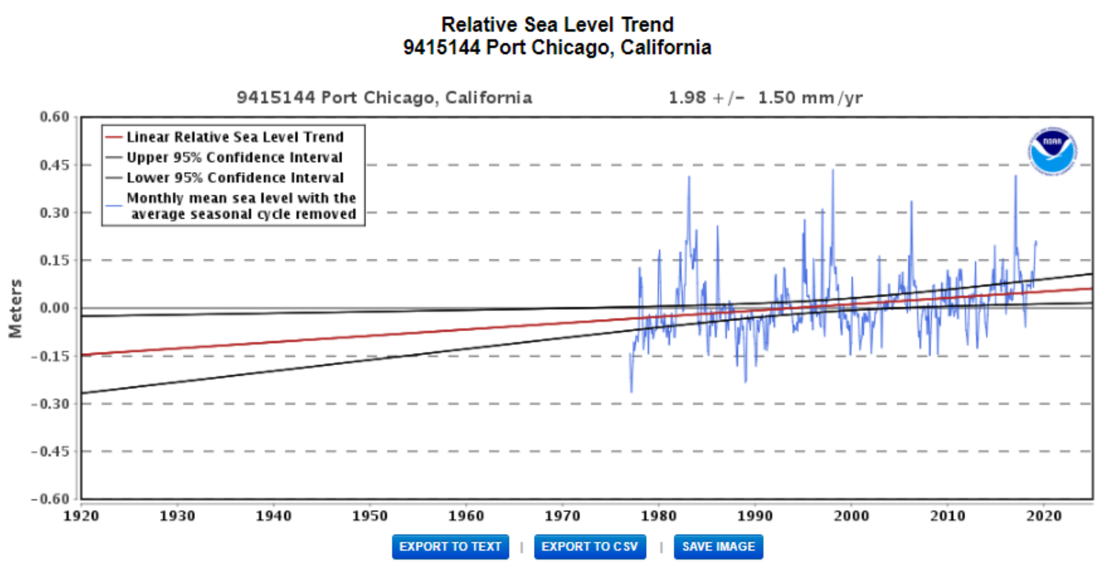
1.4.1 Original Mean Sea-Level Change Estimation from Co-Cat

This original mean sea level change estimate from Co-Cat was used in the design of the new deck structure. The California State Lands Commission requested that the deck be designed to the updated State of California Sea-Level Rise Guidance document which is shown in Section 1.4.2. We will compare the conclusion derived from Co-Cat with a conclusion derived from the Sea-Level Rise Guidance document from the California Natural Resources Agency and Ocean Protection Council (Guidance) and determine if the original design elevation is still acceptable.

Historical Rate of Sea-level Change

NOAA estimates that at Port Chicago, approximately 14 miles downriver, the mean sea-level trend is 2.08 mm/year with a 95% confidence interval of +/- 2.74 mm/year based on monthly mean sea-level data from 1976 to 2006, which is equivalent to a change of 0.68 feet in 100 years; or approximately 0.07 feet in 10 years.

[Note that NOAA has refined this value since our original design and the previous measured rate of sea-level rise is estimated to be 1.98 mm/year with a 95% confidence interval of +/- 1.5 mm/year based on monthly mean sea-level data from 1976 to 2018.]



The relative sea level trend is 1.98 millimeters/year with a 95% confidence interval of +/- 1.5 mm/yr based on monthly mean sea level data from 1976 to 2018 which is equivalent to a change of 0.65 feet in 100 years.

Future Projections

Our original estimate for the mean sea-level change at the site was based upon the "State of California sea-level rise interim guidance document" (2009), developed by the Sea-Level Rise Task Force of the Coastal and Ocean Working Group of the California Climate Action Team (CO-CAT), with science support provided by the Ocean Protection Council's Science Advisory Team and the California Ocean Science Trust. The ranges provided in this document are based upon a large body of research on climate change, focusing on establishing likely sea-level change scenarios.

Variability

Uncertainty is an integral component of this risk assessment. There are numerous factors contributing to sea-level rise, including: greenhouse gas emission, melt of glaciers, polar ice sheet accumulation, disintegration of the West Antarctica Ice Sheet, and thermal expansion. All these factors may affect sea-levels over time, to various degrees, and may not have the same influence as climate change continues. As a result, many scenarios have been used in projecting long-term sea-level variations, resulting in an appreciable level of uncertainty in estimating design values. In fact, the CO-CAT document warns that "because the science related to SLR [sea-level rise] is rapidly advancing, this guidance document will be regularly revised to reflect the latest scientific understanding of how the climate is changing and how this change may affect SLR."

Level of Risk and Sea-Level Change Trajectory

The trestle is classified as an important structure, whose potential failure in response to increasingly frequent flooding could be considered consequential for operations, but not critical environmentally. Occasional interruptions due to extreme weather and storm conditions would likely not be a factor as there are environmental limits on the vessel's transit to the berth.

New deck structures will be designed above the potentially affected elevation over water.

Based on the important but not critical nature of the structure, and given the uncertainty surrounding the estimation of long-term SLR projections, a "Medium" trajectory for future sea-level change was retained for design purposes. This trajectory carries an inherent level of risk that is commensurate with the purpose of the structure and the cost of upgrading that structure over time.

Sea-level Change Timeline

While the design life for this project is 40 years, sea-level change was conservatively estimated for a design life whose ending would coincide with 2070, approximately 50 years from construction. Based on anticipated projections for sea-level rise by 2070, **a base sea-level change value of 2.0 ft. was estimated for consideration at the end**

the project life. As early as 2030, the relative increase in sea-level may reach 0.6 ft according to BCDC "Medium" (model average) curve. This is illustrated in Figure 1.4-1.

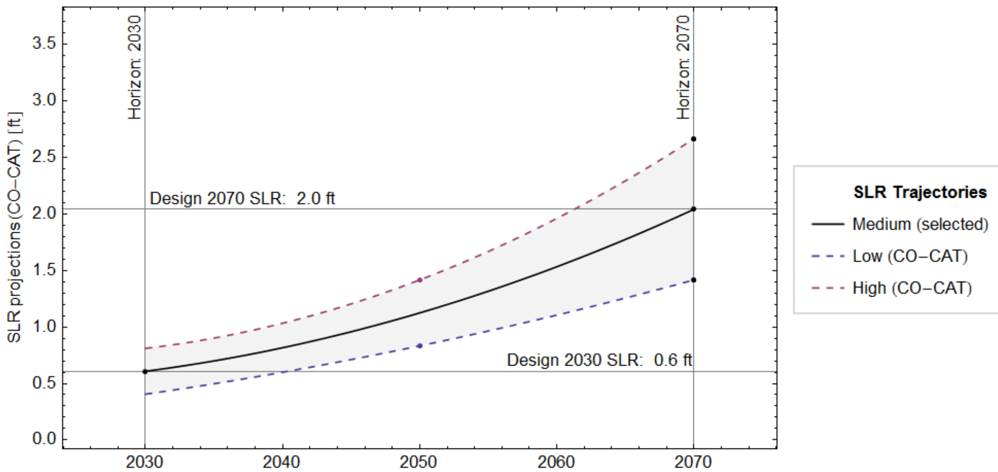


Figure 1.4-1 CO-CAT recommendations for mean sea-level change with selected "Medium" (model average) path indicating a 2.0 ft. mean sea-level change projections from 2000 baseline by 2070 (approx. 50 years from construction), and approximately 0.6 ft by 2030.

The vertical datum used for the AMPORTS Antioch Terminal project are the MLLW water level and the NAVD88 datum. The astronomical tides at the Antioch Terminal are semi-diurnal (two low tides and two high tides per day) as in other areas of San Francisco Bay.

Table 1.1- Datums for 9415064, Antioch, San Joaquin River CA. (NOAA)

Datum	Description	Elevation [ft-MLLW]	Elevation [ft-NAVD 88]
MHHW	Mean higher high water	3.88	5.96
MHW	Mean high water	3.41	5.49
MSL	Mean sea-level	2.03	4.11
MTL	Mean tidal level	2.00	4.08
DTL	Mean diurnal tidal level	1.94	4.04
MLW	Mean low water	0.59	2.67
MLLW	Mean lower low water	0.0	2.08

The projected sea-level change would set calm-water MHHW at 5.8 feet at the project site. The negative consequences of sea-level change would be most critical during a storm event including the effect of a large storm tide and runoff with elevated baseline sea-level. When combined with surge and waves there could potentially be an effect on the existing walkways, existing catwalks, and existing mooring dolphins, as well as the shoreline itself. This would mostly be due to splashing of water at the levels anticipated rather than overtopping. Five feet of combined surge and waves at this location is unlikely.

1.4.2 New Mean Sea-Level Change Estimation from State of California Sea-Level Rise Guidance, Updated 2018

Looking forward from current water levels at the site using the guidance from the SLR Guidance document from the California Natural Resources Agency and Ocean Protection Council, updated 2018, we compare our previous assumption with an estimate derived from the newer document.

The SLR Guidance directs us to check the projections for the nearest tide gauge referenced in the document. For Antioch, CA, that would be the San Francisco tide gauge.

Table 1 of SLR Guidance document, "Projected Sea-Level Rise in Feet for San Francisco," is presented below.

Using the SLR Guidance Document, Appendix 4: Risk Decision Framework. The site has low economic impacts and low impact on communities, infrastructure, or natural systems and thus assigned "Low Risk Aversion" and design for "Likely Range, high emissions."

TABLE 1: Projected Sea-Level Rise (in feet) for San Francisco

Probabilistic projections for the height of sea-level rise shown below, along with the H++ scenario (depicted in blue in the far right column), as seen in the Rising Seas Report. The H++ projection is a single scenario and does not have an associated likelihood of occurrence as do the probabilistic projections. Probabilistic projections are with respect to a baseline of the year 2000, or more specifically the average relative sea level over 1991 - 2009. High emissions represents RCP 8.5; low emissions represents RCP 2.6. ***Recommended projections for use in low, medium-high and extreme risk aversion decisions are outlined in blue boxes below.***

		Probabilistic Projections (in feet) (based on Kopp et al. 2014)					H++ scenario (Sweet et al. 2017) *Single scenario
		MEDIAN	LIKELY RANGE		1-IN-20 CHANCE	1-IN-200 CHANCE	
		50% probability sea-level rise meets or exceeds...	66% probability sea-level rise is between...		5% probability sea-level rise meets or exceeds...	0.5% probability sea-level rise meets or exceeds...	
				Low Risk Aversion		Medium - High Risk Aversion	Extreme Risk Aversion
High emissions	2030	0.4	0.3 -	0.5	0.6	0.8	1.0
	2040	0.6	0.5 -	0.8	1.0	1.3	1.8
	2050	0.9	0.6 -	1.1	1.4	1.9	2.7
Low emissions	2060	1.0	0.6 -	1.3	1.6	2.4	
High emissions	2060	1.1	0.8 -	1.5	1.8	2.6	3.9
Low emissions	2070	1.1	0.8 -	1.5	1.9	3.1	
High emissions	2070	1.4	1.0 -	1.9	2.4	3.5	5.2
Low emissions	2080	1.3	0.9 -	1.8	2.3	3.9	
High emissions	2080	1.7	1.2 -	2.4	3.0	4.5	6.6
Low emissions	2090	1.4	1.0 -	2.1	2.8	4.7	
High emissions	2090	2.1	1.4 -	2.9	3.6	5.6	8.3
Low emissions	2100	1.6	1.0 -	2.4	3.2	5.7	
High emissions	2100	2.5	1.6 -	3.4	4.4	6.9	10.2
Low emissions	2110*	1.7	1.2 -	2.5	3.4	6.3	
High emissions	2110*	2.6	1.9 -	3.5	4.5	7.3	11.9
Low emissions	2120	1.9	1.2 -	2.8	3.9	7.4	
High emissions	2120	3	2.2 -	4.1	5.2	8.6	14.2
Low emissions	2130	2.1	1.3 -	3.1	4.4	8.5	
High emissions	2130	3.3	2.4 -	4.6	6.0	10.0	16.6
Low emissions	2140	2.2	1.3 -	3.4	4.9	9.7	
High emissions	2140	3.7	2.6 -	5.2	6.8	11.4	19.1
Low emissions	2150	2.4	1.3 -	3.8	5.5	11.0	
High emissions	2150	4.1	2.8 -	5.8	5.7	13.0	21.9

**Most of the available climate model experiments do not extend beyond 2100. The resulting reduction in model availability causes a small dip in projections between 2100 and 2110, as well as a shift in uncertainty estimates (see Kopp et al. 2014). Use of 2110 projections should be done with caution and with acknowledgement of increased uncertainty around these projections.*

From the table, over a 50-year design life from 2020 we would want to design for a 1.9 foot rise in sea-level as shown for the 2070 projections.

1.4.3 Comparison of Elevations

The original design considered a SLR of 2.0 ft with criteria from Co-Cat. The new SLR Guidance resulted in a design 1.9 ft SLR. The original design remains compliant with the newer Guidance document.

1.4.4 Elevation Consideration

Our current deck design elevation of 12 ft above MLLW at the face, sloping back toward the shoreline to an elevation of 10.7 ft MLLW is more than capable of remaining operational with a 2 foot rise in sea-level.

Inundation maps for 100-year storm events from https://cal-adapt.org/ provide the following graphics for no sea-level rise, 0.5 meter (1.64 ft) sea-level rise and, 1.0 meter (3.28 ft) sea level rise scenarios.

Note that no inundation of the landside south of the top of bank (10.7 ft MLLW), and therefore, above the lowest point of the top of new deck, through the 0.5 meter (1.64 ft) SLR projection. At 3.28 feet of SLR combined with a 100 year storm, some puddling occurs south of the top of the bank, so the lowest part of the deck might be temporarily affected. However, this may only occur at SLR scenarios above the 2.0 ft we are anticipating.

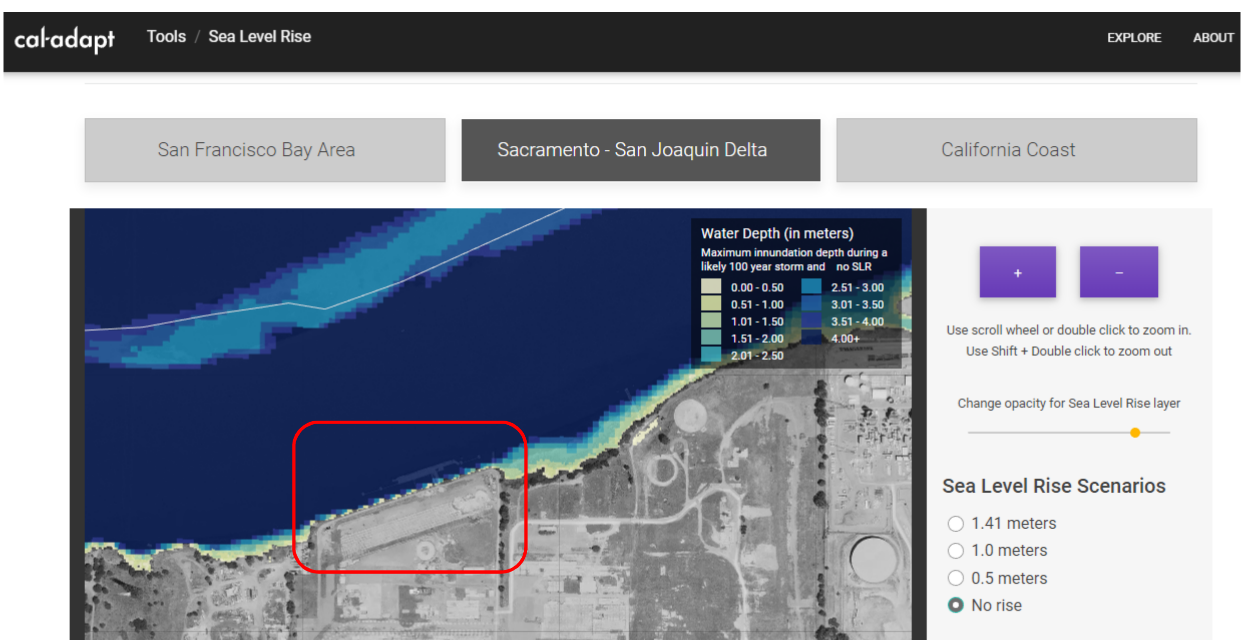


Figure 2- Inundation at 100-year storm with 0 ft SLR

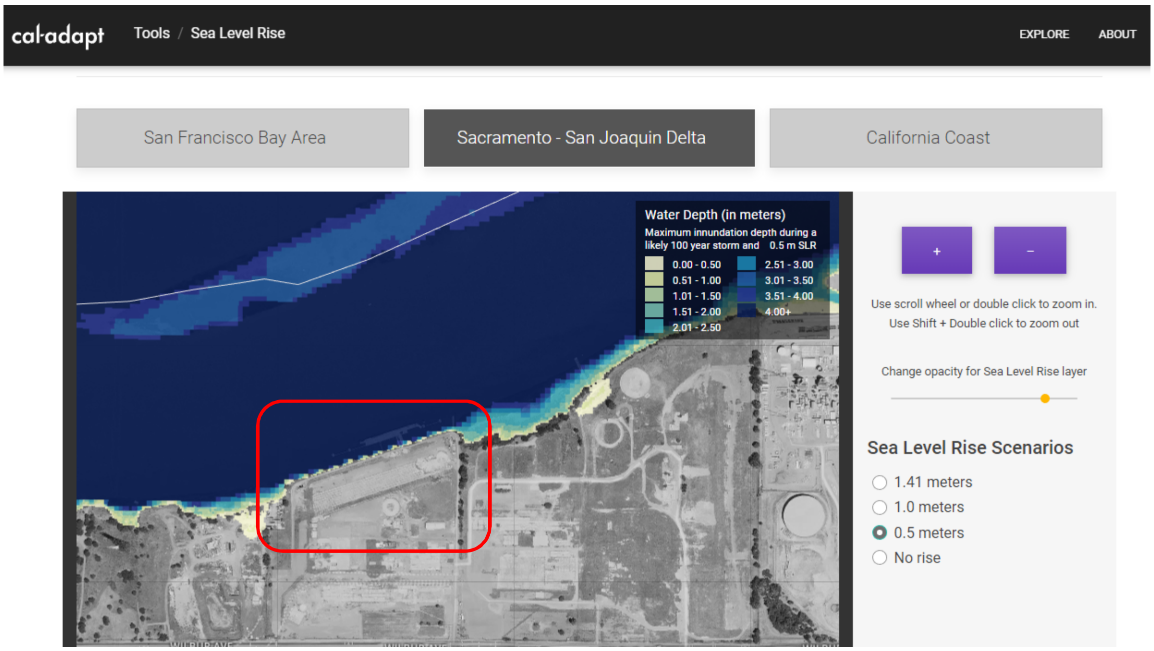


Figure 3- Inundation at 100-year storm with 1.64 ft SLR

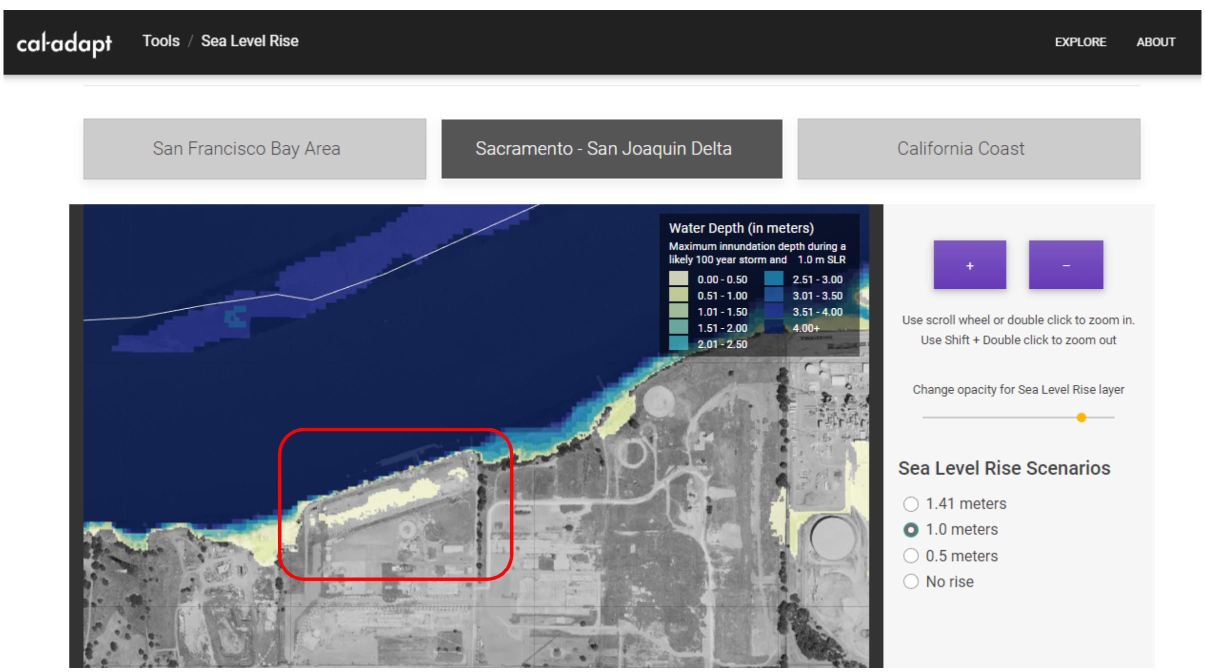


Figure 4- Inundation at 100-year storm with 3.28 ft SLR