San Joaquin River
Deep Water Ship Channel Demonstration
Dissolved Oxygen Aeration Facility
Initial Study/Mitigated Negative Declaration

Prepared for:

California Department of Water Resources
1416 Ninth Street
Sacramento, CA 94236-0001
Contact: Robert C. Pedlar, P.E.

Prepared by:

Jones & Stokes
2600 V Street
Sacramento, CA 95818-1914
Contact: Ted Daum
916/737-3000

&

Chambers Group
17671 Cowan Avenue, Suite 100
Irvine, Ca 92614

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Acronyms and Abbreviations

AAQS	ambient air quality standards
AST	aboveground storage tank
BMPs	best management practices
CalEPA	California Environmental Protection Agency
CBDA	California Bay-Delta Authority
CEQA	California Environmental Quality Act
DFG	California Department of Fish and Game
DO	dissolved oxygen
DWR	California Department of Water Resources
DWSC	San Joaquin River Deep Water Ship Channel
ESU	evolutionarily significant unit
HARP	Historic and Archeological Resources Protection
HDPE	high density polyethylene
HMMP	hazardous material management plan
HUD	Housing and Urban Development
IS	Initial Study
lb	pounds
LOX	liquid oxygen
msl	mean sea level
MWD	Metropolitan Water District
NCS	Naval Communications Stations
NO_2	nitrogen dioxide
NOAA Fisheries	National Oceanographic and Atmospheric Administration's National Marine Fisheries Service

NOx;	nitrogen oxides
NRHP	National Register of Historic Places
NSA	Navy Supply Annex
O_3	Ozone
OSHA	Occupational Health and Safety Administration
Pb	including lead
PLC	Programmable Logic Controller
Port	Port of Stockton
PVC	polyvinyl chloride
ROG	reactive organic gases
SDWSC	Stockton Deep Water Shipping Channel
SHPO	State Historic Preservation Officer
SJCEHD	San Joaquin County Environmental Health Division
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SO_2	sulfur dioxide
SWRCB	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	U.S. Environmental Protection Agency

ENVIRONMENTAL CHECKLIST FORM

1. **Project Title:**
San Joaquin River Deep Water Ship Channel (DWSC) Demonstration Dissolved Oxygen Aeration Facility

2. **Lead Agency Name and Address:**
California Department of Water Resources
Bay-Delta Office
1416 Ninth Street
P.O. Box, Sacramento, Ca 94236-0001

3. **Contact Person and Telephone Number:**
Robert C. Pedlar, P.E.
(916) 653-5085

4. **Project Location:**
The proposed demonstration facility will be located on Dock 20, Rough and Ready Island, Port of Stockton's West Complex, Stockton, CA.

5. **Project Sponsor's Name and Address:**
California Bay-Delta Authority
650 Capitol Mall, Fifth Floor
Sacramento, CA 95814

6. **General Plan Designation:** Rough and Ready Island Redevelopment Area

7. **Zoning:** Port Industrial.

8. **Description of Project:**

Project Background

California Department of Water Resources (DWR) and California Bay-Delta Authority (CBDA) water quality monitoring data indicate that low dissolved oxygen (DO) concentrations exist annually within the San Joaquin River and the Port of Stockton (Port) Deep Water Ship Channel (DWSC). The Port DWSC, located in the San Joaquin River in the City of Stockton, California, San Joaquin County, is the navigation channel used by ships traveling from the San Francisco Bay to the Port (Figure 1, Project Location Map). The DWSC is approximately 78 miles long and terminates at the Deep Water Turning Basin adjacent to the Port. It is in the last 12 miles of the DWSC, before entering the Port, that insufficient concentrations of DO are present.

DO is a form of oxygen that is available for use by organisms living in the water. Low DO levels correlate with high algae and ammonia nitrogen concentrations, warm water temperatures, and low river flows in the San Joaquin River that occur in the months from May to September. Impacts associated with low DO

concentrations include, but are not limited to, the degradation of water quality, aquatic habitat, and aesthetics (Jones & Stokes 2003).

In 1994 the State of California placed the San Joaquin River on the Clean Water Act Section 303(d) list of impaired water bodies because of low DO levels (RWQCB 1998). DO levels continued to decline; in 1998 the state classified the issue as high priority for correction, placing a Total Maximum Daily Load (TMDL) requirement on the DWSC. In response, a TMDL Implementation Program was developed, specifying that target DO levels in the San Joaquin River between Turner Cut and Stockton should not fall below 5 mg/L December through August, and 6 mg/L September 1 through the end of November.

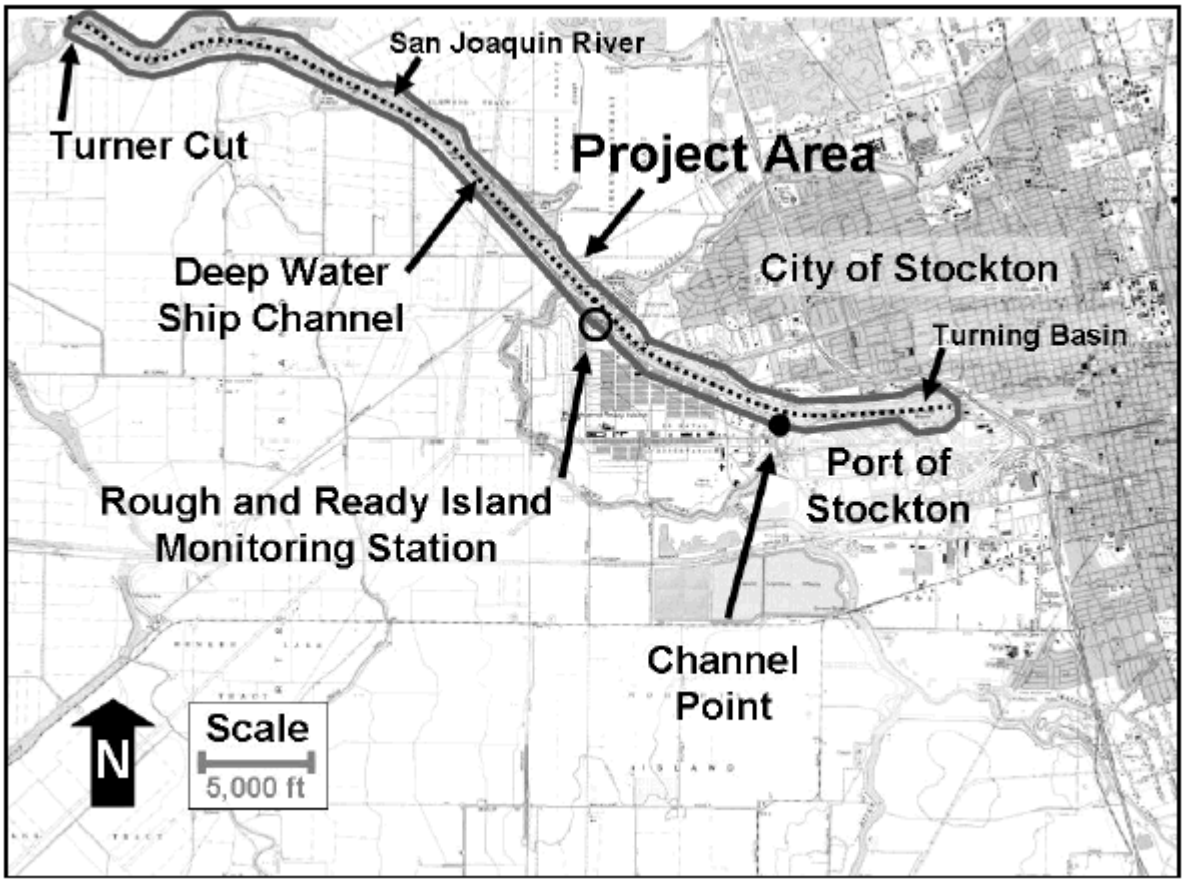


Figure 1. Project Location Map

The implementation program suggested a three-tiered approach to solving the DO problem. The program included:

- Enhance DO levels within the DWSC with the use of mechanical or non-mechanical aeration techniques.

- Reduce oxygen demand by decreasing nutrient loading associated with upstream water uses.
- Evaluate and mitigate the effects of channel deepening within the DWSC.

Aeration devices have been shown to increase DO by adding oxygen or air directly to the water body, adding oxygen-saturated water to the water body, or mixing the water to facilitate diffusion of atmospheric oxygen into the water (Jones & Stokes 2004).

Methods for mechanically oxygenating waters within the project area are presented in the Evaluation of Aeration Technologies for the DWSC (Jones & Stokes 2003) and in the Aeration Research and Implementation Analysis Study for the Stockton Ship Channel Report (Jones & Stokes 2004). Results of the Implementation Analysis Study report recommended that three technologies be considered for further evaluation and possible implementation. These technologies are the U-Tube, Speece cone, and bubble plume aeration. The San Joaquin River Dissolved Oxygen Aeration Project Draft Engineering Feasibility Study, prepared in June 2004 by HDR Engineering (HDR 2004) evaluated these three different treatment technologies and their ability to transfer 10,000 pounds (lb) of O_2/day to the channel. Based on that evaluation and additional *in-situ* testing, the deep U-Tube was selected as the most viable option for implementation (Jones & Stokes, 2004).

Proposed Project

Initially, a small-scale demonstration project was recommended to verify design assumptions used in the analysis. However, as a result of the San Joaquin River DO TMDL working group meeting held on September 23, 2004, which included the DWR, the CBDA, and the environmental consulting firms of Jones & Stokes and HDR, a larger, full-scale demonstration project was selected to provide an opportunity to measure and confirm the impact that 10,000 lb O_2/day transferred as DO to the DWSC would have in the project area.

Objectives

The objectives of the demonstration project are to:

- transfer 10,000 lbs O_2/day as DO to the DWSC,
- evaluate water quality benefits associated with the delivery of 10,000 lbs O_2/day,
- collect key design parameters to better understand their relationship to U-Tube transfer efficiency, and

- gather additional information on impacts that may occur as an unintended consequence of large-scale aeration.

The conceptual site layout is illustrated in Figure 2. The proposed demonstration facility will be installed near Dock 20, Rough and Ready Island, on the Port of Stockton's West Complex, near Stockton, California. Intake screens will be installed away from shipping traffic, between the piers that support Dock 20, and connected to two pump intakes. None of the pilot project infrastructure will intrude into or interfere with shipping traffic in any way. This design will have to consider the potential impacts of prop wash caused by ships and support vessels during normal Port operations. The pump intakes will direct river water to pumping columns for two vertical turbine pumps. The pumping columns will be mounted through the dock structure where the pump discharge headers and pump motors are located. The pumping facility located above Dock 20 will be secured with an 8-foot chain link fence and gate. The pumps will convey the river water via discharge piping to two U-Tube contactor wells located west of Dock 20 on the adjacent island. Oxygen will be injected at the top of each well. The wells will be constructed to a depth of approximately 200 feet below grade. Each well will be totally contained, including a bottom seal. Oxygenated water will flow down the well in a concentric feed pipe or pipe section and back up the well annular space or section. Oxygenated water exiting the U-Tube wells will be routed through approximately 1,000 feet of piping back to the DWSC, under Dock 20, and 1,000 feet upstream from the pump intakes, where a liquid diffuser mounted along an inboard row of piers, away from shipping traffic and at the greatest depth possible, will discharge the oxygenated water back into the river, away from the dock structure, and toward the ship channel. Figure 3 shows a schematic of the U-Tube system.

Expected Construction Activities

There are four major independent components required for the construction of the demonstration U-Tube aeration facility—two 200-foot-deep wells, two intake pumps, one 1000-foot-long diffuser pipe, and a liquid oxygen (LOX) storage platform and refilling area.

The wells will be constructed with a standard large diameter auger/drilling rig capable of drilling holes to 4 feet in diameter. Excavated material will be loaded onto trucks and hauled off site. Concrete/Gunite will be delivered to the site to seal the bottom of each casing and backfill voids around the casing exteriors. Additional construction requiring a crane will take up to 1 more week for installation of smaller-diameter, 200–foot-long down tubes centered inside the well casings. Each well will be capped and plumbing will extend to the pumping intake area and to the discharge line. Current estimates indicate the construction period for the excavation of the cavities and installation of the casings will be around 1 week.

Two intakes will be constructed to supply water from the DWSC to the U-Tube wells. The pumps will be mounted to the concrete deck of Dock 20, and the

intakes will draw water through fish screens beneath the deck. Holes will be drilled through the deck using a drilling rig. A crane or excavator will be required to offload and place pumping equipment. Fish screens and intake piping will likely be placed with the aid of divers and a support barge. Plumbing will extend from the intake pumps to the U-tubes. This construction could take up to 1 month, depending on material availability.

One discharge line will be installed under the dock structure. Divers and a support barge will work from the edge of the existing dock to mount the discharge line along an interior line of piers. Heavy equipment may be required to deliver materials to the divers and support barge. The discharge line will connect to plumbing extending from the U-tubes. This construction could take up to 1 month, depending on water visibility and tides.

One concrete pad and security fence or wall will be constructed to house the LOX storage and refilling area. This construction will require heavy grading equipment, labor crews, and a concrete delivery truck. This construction should be completed in 1 week.

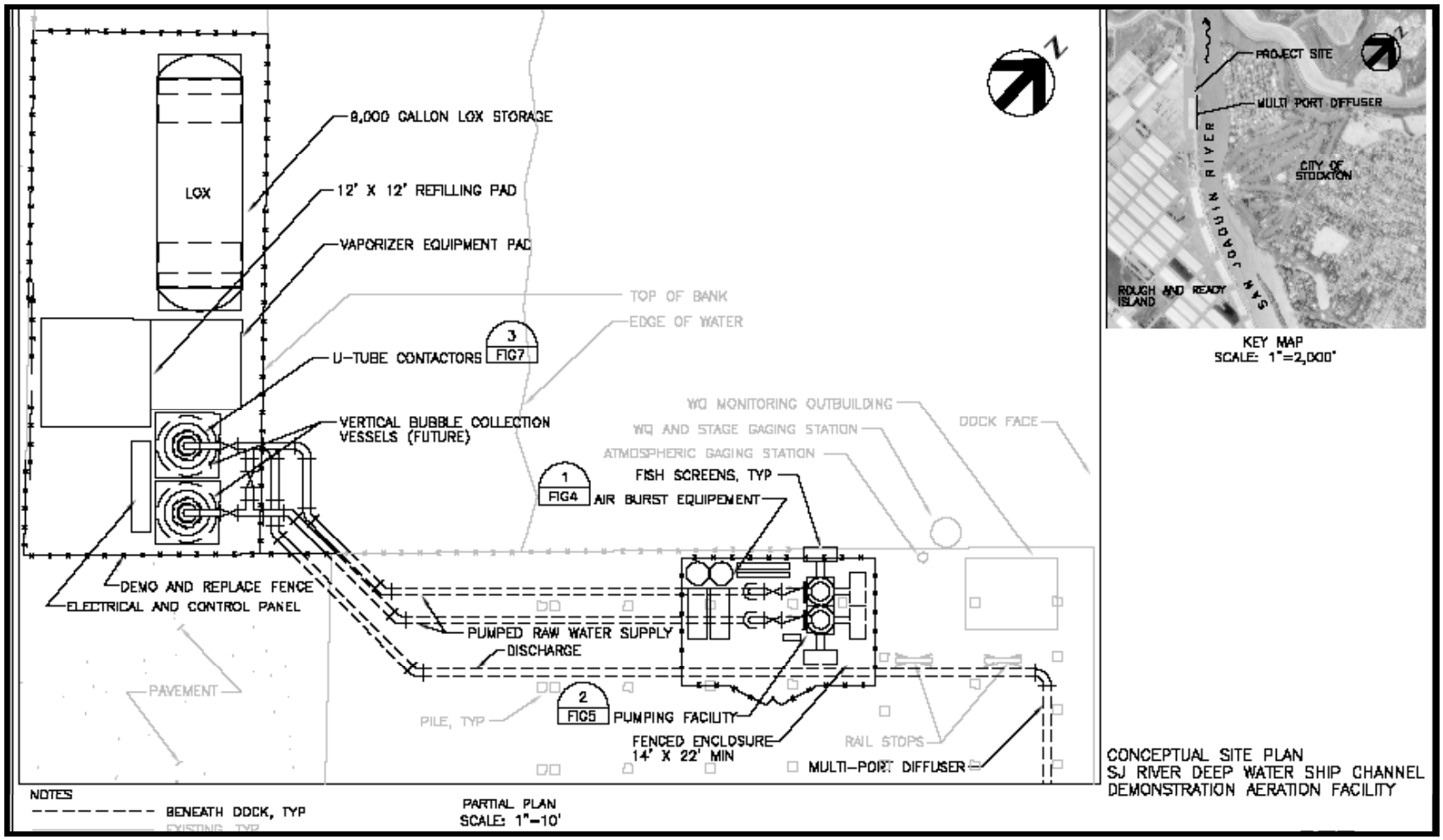
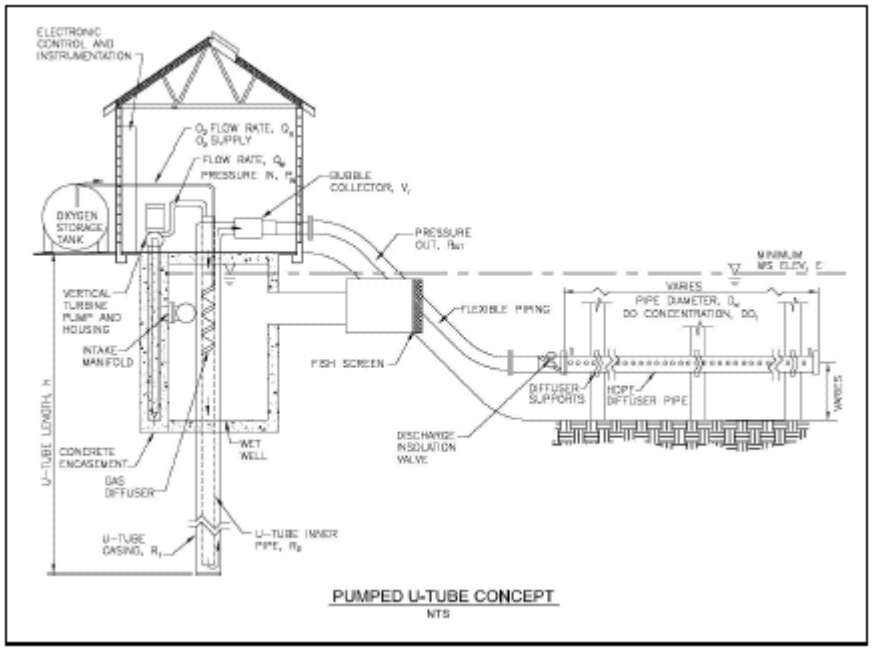


Figure 2. Conceptual Site Layout



Source: Jones & Stokes 2004

Figure 3. U-Tube Schematic

Design Criteria

Table 1 summarizes the project design criteria.

Table 1. Design Criteria

Criteria	Value
Facility demonstration period	2 years
Facility operation period	24 hrs/day for a maximum of 100 days/year
Objective facility oxygen mass transfer rate	10,000 lb O_2/day
Design U-Tube oxygen transfer efficiency	90%
Minimum design U-Tube oxygen transfer efficiency	80%
Design U-Tube velocity	10 feet/second
Aeration device	U-Tube side stream aeration
Oxygen source	Liquid oxygen (LOX)
Water temperature at intake	82ºF (28ºC)
Initial DO concentration at intake	5.2 milligrams per liter (mg/L)
Fish screens	Meet National Oceanographic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries) and California Department of Fish and Game (DFG) standards
Navigation	No impact on shipping
Port operations/noise	Meet Port requirements

Source: HDR 2004

Facility Operations

The demonstration facility will be composed of several elements that include fish screens, a pumping facility, LOX storage and supply, U-Tube assemblies, and electrical and control equipment. Table 2 provides a summary of the design and construction elements required for the facility.

Table 2. Design/Construction Elements

Element	Descriptions
Fish Screens	Two Johnson type barrel fish screens feeding two intake headers. Intake headers connected to pump intakes. Screens are self-cleaning using air scour.
Pumps	Two vertical turbine pumps with electrical motors. Water pumped to U-Tube contactor (well) and discharged out to a multi-port diffuser. Pump operates ON/OFF through a dedicated control panel at each pump. Flow can be reduced using a throttling valve in a set position. Isolation valves present to isolate flows from one pump or the other to one U-Tube or the other via cross over piping.

Element	Descriptions
LOX supply	Oxygen storage tank, vaporizing equipment, and feed lines with valves and piping located on site. Feed pressure changes as river level changes. Feed controlled to set point. Storage volume sized such that refilling intervals are not to exceed one refill per week. Maximum feed rate sized by considering a minimum 80% transfer rate at design conditions. LOX storage and distribution equipment to the feed control equipment shall be Vendor supplied. Note that facility designers are responsible for design of connection from vendor-supplied feed to the U-Tube.
U-Tube contactor	Two identical U-Tube assembly contactor wells are specified. Outer casing constructed of welded steel capable of resisting corrosion from the surrounding soil. The bottom of each U-Tube shall be sealed with concrete to eliminate the potential for groundwater interaction. Inner casing constructed of alternate material such as high density polyethylene (HDPE) or polyvinyl chloride (PVC) to reduce weight and minimize support structure requirements. Centering supports/guides attached to the inner pipe can be used to guide and stabilize the inner piping. Each U-Tube will be designed to provide a minimum of 5,000 lb O_2/day.
Off-gas collection	A gas/liquid separation vessel and standpipe serve as a temporary off-gas collector to vent oxygen gas that remains in a gaseous state. The vent gas flow rate from the collector is measured. Vent gas oxygen content is measured.
Bubble collection	Space for future construction of a bubble collection device shall be considered during design.
Multi-port diffuser	A discharge pipe is used to transmit effluent (oxygenated water) from the U-Tubes 1,000 feet upstream to a single liquid diffuser lateral, mounted along the piers beneath Dock 20. The diffuser lateral is affixed to individual piers with fabricated pipe supports at the deepest possible installation point. The installation must be as deep as possible to guard against effervescence.
Instrumentation and Control	Influent valves with manual adjustment. Oxygen feed automated with motorized valves and set point. On-site readout display of operating parameters (pressure, flow, DO concentration). Communication equipment required to upload data to a remote point. A Programmable Logic Controller (PLC) for data logging, communication, and motor control where needed. A local control panel for operation of fish screen air burst system. Dedicated control panel for on-site ON/OFF start-up for pumps.
Site Features	
Site work	Concrete foundations are required for the oxygen supply tank, evaporators, regulation, and refilling equipment. Refilling occurs over concrete pavement. Core drilling in the dock structure will be necessary for installing liquid pumping and piping equipment. Asphalt concrete shall provide a clean, orderly, and drivable working area surrounding the pumping and oxygen storage facility. Provide turnaround for delivery tanker. Chain link fencing used to enclose and secure the pump and oxygen supply equipment. One gate can be installed to allow entry of personnel and vehicles. Use simple padlock and chain.
Architectural	None required.

Element	Descriptions
HVAC	None required.

Source: HDR and Jones & Stokes 2004

9. Surrounding Land Uses and Setting:

This project is located near the City of Stockton, California, in San Joaquin County, on the San Joaquin River, Stockton DWSC at the downstream end of Dock 20, Port of Stockton West Complex, on Rough and Ready Island. The Port of Stockton has recently acquired Rough and Ready Island from the U.S. Navy and refers to the developed portion of the island as the West Complex. The project area and land adjacent to the project area are currently zoned for industrial activities. Single-family residences and a golf course/country club are located across the channel northeast and east of the project. Operation of the proposed aeration demonstration facility shall adhere to noise and light restrictions currently in effect at the Port of Stockton.

10. Other Public Agencies Whose Approvals Are Required:

Agency	Permit or Approval
U.S. Army Corps of Engineers	Rivers and Harbors Act/Section 10 NWP #7
RWQCB	Section 401 permit
California Department of Fish and Game	Section 1602 Streambed Alteration Agreement
U.S. Fish and Wildlife Service and/or NOAA Fisheries	Section 7 Consultation
City of Stockton	Construction permits

Environmental Factors Potentially Affected

An Initial Study (IS) has been prepared to assess the proposed project's potential effects on the environment and the significance of those effects. Based on the IS, it has been determined that the proposed project would have no potentially significant impacts on the environment because mitigation and conservation measures would be implemented. This conclusion is supported by the following findings:

1. The proposed project would not affect agricultural resources, cultural resources, land use, mineral resources, population/housing, public services, or recreation.
2. The proposed project would have a less-than-significant impact on aesthetics, air quality, geology and soils, hazards and hazardous materials, transportation/traffic, and utilities/service systems.

3. Mitigation has been proposed to reduce potentially significant impacts related to biological resources, hydrology and water quality, and noise to less-than-significant levels.

The following measures will be employed to reduce impacts to a less than significant level:

- construction air emission controls,
- best management practices (BMPs) for contaminant spill control,
- surveys for Swainson's hawk and burrowing owl nests in the immediate vicinity of the project area prior to construction activity,
- screens to avoid impingement and entrainment impacts on fish, and
- noise mitigation measures to conform to city, state and federal standards

Therefore, the environmental factors below would have no potentially significant impacts from the proposed project.

- ☐ Aesthetics
- ☐ Agriculture Resources
- ☐ Air Quality
- ☐ Biological Resources
- ☐ Cultural Resources
- ☐ Geology and Soils
- ☐ Hazards/Hazardous Materials
- ☐ Hydrology/Water Quality
- ☐ Land Use and Planning
- ☐ Mineral Resources
- ☐ Noise
- ☐ Population and Housing
- ☐ Public Services
- ☐ Recreation
- ☐ Transportation/Circulation
- ☐ Utilities and Service Systems
- ☐ Mandatory Findings of Significance

Determination

On the basis of this initial evaluation:

I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.	☐
I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.	■
I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.	☐
I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.	☐
I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.	☐

Signature	Date
Katherine F. Kelly	Department of Water Resources
Printed Name	Agency

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
I.	**AESTHETICS.** Would the project:				
a.	Have a substantial adverse effect on a scenic vista?	❑	❑	❑	■
b.	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings along a scenic highway?	❑	❑	❑	■
c.	Substantially degrade the existing visual character or quality of the site and its surroundings?	❑	❑	■	❑
d.	Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?	❑	❑	■	❑

Setting

The proposed project would be located on the west side of the DWSC of the San Joaquin River, Dock 20, Port of Stockton West Complex. Dock 20 is an industrial area consisting predominantly of large ship unloading facilities, material transportation equipment, and parking areas.

The project area can be seen from the Stockton Country Club and residences across the approximately 500-foot-wide to 800-foot-wide DWSC; however, a screened chain link fence would enclose most of proposed project's operating equipment.

The proposed project is not located in the vicinity of any local- or state-designated scenic highways, nor have any significant scenic resources been identified in the project area.[1]

Impact Discussion

a, b. Have a substantial adverse effect on a scenic vista. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.

No Impact. There are no designated scenic vistas, scenic resources, or scenic highways in the project area

[1] Environmental Science Associates, *Port of Stockton West Complex Development Plan Draft Environmental Impact Report*, prepared for the Port of Stockton, November 2003.

c. Substantially degrade the existing visual character or quality of the site and its surroundings.

Less-than-Significant. The project would be located in an industrial area characterized by large ship-unloading facilities, material transportation equipment, and parking areas. In addition, a screened chain link fence would shield most of proposed project's operating equipment from view.

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

Less-than-Significant. The proposed project would use lighting only for safety and security purposes with fixtures that would shield and focus light sources downward and minimize light spillage to areas outside the project area.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
II.	**AGRICULTURAL RESOURCES.** In determining whether impacts on agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation. Would the project:				
a.	Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	❑	❑	❑	■
b.	Conflict with existing zoning for agricultural use or conflict with a Williamson Act contract?	❑	❑	❑	■
c.	Involve other changes in the existing environment that, due to their location or nature, could result in conversion of Farmland to non-agricultural use?	❑	❑	❑	■

Setting

The proposed project would be located on Dock 20, Port of Stockton West Complex. Dock 20 is an industrial area consisting predominantly of large ship-unloading facilities, material transportation equipment, and parking areas.

The proposed project is not located on or in the vicinity of any land designated or historically used for agricultural purposes.[2]

Impact Discussion

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

[2] Ibid.

No Impact. The proposed project site and vicinity are not shown on maps prepared pursuant to the Farmland Mapping and Monitoring Program.

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

No Impact. The project would be located in an industrial area zoned for Port Industrial uses. Therefore, the proposed project would be in compliance with existing zoning and would not conflict with any Williamson Act contract.

c. Involve other changes in the existing environment, which, because of their location or nature, could result in conversion of farmland to non-agricultural use.

No Impact. The proposed project would not create changes in the existing environment that would result in the conversion of farmland to farmland to non-agricultural use.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
III.	**AIR QUALITY.** When available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a.	Conflict with or obstruct implementation of the SCAQMD or Congestion Management Plan?	❑	❑	■	❑
b.	Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	❑	❑	■	❑
c.	Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the air basin is non-attainment (ozone, carbon monoxide, & PM10 under an applicable federal or state air quality standard?	❑	❑	■	❑
d.	Expose sensitive receptors to substantial pollutant concentrations?	❑	❑	■	❑
e.	Create objectionable odors affecting a substantial number of people?	❑	❑	■	❑

Setting

Regional Air Quality

The project site is located within the San Joaquin Valley Air Basin (SJVAB), which includes San Joaquin, Merced, Stanislaus, Madera, Fresno, Kings, Tulare, and Kern Counties. Air quality conditions in the SJVAB are under the jurisdiction of the San Joaquin Valley Air Pollution Control District (SJVAPCD). The SJVAB exceeds the state and federal standards for two of the six criteria air pollutants. The entire air basin is non-attainment for ozone and particulate levels (PM10).

The U.S. Environmental Protection Agency (USEPA) has designated the San Joaquin County portion of the SJVAB as an extreme non-attainment area for the 1-hour ozone standard and a serious non-attainment area for the 8-hour ozone standard. For PM10, the County is designated as a moderate non-attainment area. For carbon monoxide (CO), the Stockton Urbanized Area (Census Bureau

Urbanized Area, 3/29/85, 50 FR 12540) is designated as a moderate (≤ 12.7 ppm) maintenance area. The State of California has designated the Stanislaus County portion of the SJVAB as being a severe non-attainment area for the 8-hour ozone standard. For PM10 and PM2.5, the County is designated as a non-attainment area. For CO, the County is designated as an attainment area.

Climate/Meteorology

A semipermanent high-pressure area over the northern Pacific Ocean holds storm tracks to the north and away from California during the summer. During the winter, this pressure zone retreats southward and permits storm centers to swing across California. The project area climate is one of hot, dry summers and cool, rainy winters. The mean annual precipitation in the City of Stockton is approximately 13 inches. The daily high temperatures range from an average of 53°F during January, the coldest month, to an average of 94°F during July, the hottest month. The average lows are 37 and 61°F during these same months, respectively. The annual average wind speed is about 9 mph. June is the windiest month with average speeds of about 11 mph.

Temperature inversions often occur in the San Joaquin Valley. A temperature inversion is a layer of warm air trapping cooler air beneath it. This reduces mixing of air in the lower layers and restricts the vertical dispersion of air contaminants. Surface-based inversions are present on most mornings throughout the year in the San Joaquin Valley. These inversions burn off during warmer daytime temperatures. Elevated inversions that can trap air and exacerbate air pollution problems occur primarily during winter. The San Joaquin Valley experiences calm conditions 31% of the time during the winter, contributing to stagnation and buildup of air pollutants.

Criteria Air Pollutants

The air pollutants emitted into the ambient air by stationary and mobile sources are regulated by federal and state law. These regulated air pollutants are known as "criteria air pollutants" and are categorized as primary and secondary pollutants. Primary criteria air pollutants and their precursors are those that are emitted directly from sources. CO reactive organic gases (ROG); nitrogen oxides (NOx); sulfur dioxide (SO_2); and most fine particulate matter (PM10, PM2.5), including lead (Pb) and fugitive dust, are primary air pollutants. Secondary criteria air pollutants are those pollutants formed by chemical and photochemical reactions in the atmosphere. Ozone (O_3) and nitrogen dioxide (NO_2) are the principal secondary pollutants.

Ambient Air Quality Standards

Air quality impacts of a project, combined with existing background air quality levels, must be compared to the applicable ambient air quality standards (AAQS) to gauge their significance. These standards are the levels of air quality considered safe, with an adequate margin of safety, to protect the public health and welfare. They are designed to protect those sensitive receptors most susceptible to further respiratory distress, such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollutant concentrations considerably above these minimum standards before adverse effects are observed. Those standards currently in effect in California are listed in Table 3.

Table 3. Ambient Air Quality Standards for Criteria Pollutants

Pollutant	Averaging Time	California Standard	Federal Primary Standard	Major Pollutant Sources
Ozone (O_3)	1 hour	0.09 ppm	0.12 ppm	Motor vehicles.
	8 hours	*	0.08 ppm	
Carbon Monoxide (CO)	1 hour	20 ppm	35 ppm	Internal combustion engines, primarily gasoline-powered motor vehicles.
	8 hours	9.0 ppm	9 ppm	
Nitrogen Dioxide (NO_2)	Annual Average	*	0.05 ppm	Motor vehicles, petroleum-refining operations, industrial sources, aircraft, ships, and railroads.
	1 hour	0.25 ppm	*	
Sulfur Dioxide (SO_2)	Annual Average	*	0.03 ppm	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
	1 hour	0.25 ppm	*	
	24 hours	0.04 ppm	0.14 ppm	
Suspended Particulate Matter (PM10 PM2.5)	Annual Geometric Mean	30 µg/m^3 (PM10)	65 µg/m^3 (PM2.5)	Dust and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
	Annual Arithmetic Mean	*	50 µg/m^3 (PM10)	
	24 hours	50 µg/m^3 (PM10)	150 µg/m^3 (PM10) 15 µg/m^3 (PM2.5)*	
Lead (Pb)	Monthly	1.5 µg/m^3	*	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.
	Quarterly	*	1.5 µg/m^3	
Sulfates (SO_4)	24 hours	25 µg/m^3	*	Industrial processes.

ppm: parts per million; µg/m^3: micrograms per cubic meter

* = standard has not been established for this pollutant/duration by this entity.

Existing Air Quality

Stockton is located within the SJVAB and is under jurisdiction of the SJVAPCD. The project is located closest to the Hazelton Street monitoring station, and ambient pollutant levels are best inferred from data monitored at this station. The most current 5 years of data monitored at the station are included in Table 4. The data indicate that the area is sensitive to ozone and respirable particulates, as these standards are still violated on an infrequent basis.

Table 4. Ambient Air Quality Monitoring Summary, Hazelton Street Monitoring Station[1]

Pollutant/Standard	Number of Days Thresholds Were Exceeded and Maximum Levels during Such Violations				
	2000	2001	2002	2003	2004
Ozone					
State 1-Hour $\geq$ 0.09 ppm	4	5	2	3	1
Federal 1-Hour > 0.12 ppm	0	0	0	0	0
Federal 8-Hour > 0.08 ppm	0	1	0	1	0
Max. 1-Hour Conc. (ppm)	0.107	0.103	0.102	0.104	0.096
Max. 8-Hour Conc. (ppm)	0.080	0.088	0.081	0.088	0.080
Carbon Monoxide					
State 8-Hour > 9.0 ppm	0	0	0	0	0
Federal 8-Hour $\geq$ 9.5 ppm	0	0	0	0	0
Max. 8-Hour Conc. (ppm)	3.91	6.03	3.21	3.14	2.26
Nitrogen Dioxide					
State 1-Hour $\geq$ 0.25 ppm	0	0	0	0	0
Max. 1-Hour Conc. (ppm)	0.099	0.084	0.076	0.088	0.079
Inhalable Particulates (PM10)[1]					
State 24-Hour > 50 $\mu g/m^3$	9	11	10	3	0
Federal 24-Hour > 150 $\mu g/m^3$	0	0	0	0	0
Max. 24-Hour Conc. ($\mu g/m^3$)	97.0	147.0	91.0	90.0	50.0
Inhalable Particulates (PM2.5)[1]					
Federal 24-Hour > 65 $\mu g/m^3$	1	2	0	0	0
Max. 24-Hour Conc. ($\mu g/m^3$)	78.0	76.0	64.0	45.0	34.0

[1] Percent of samples exceeding standard.

ppm: parts per million; $\mu g/m^3$: micrograms per cubic meter

Source: California Air Resources Board Internet Web Site, January 11, 2005.

Sensitive Receptors

Some land uses are considered more sensitive to air pollution than others because of the types of population groups or activities involved. Sensitive population groups include children, the elderly, the acutely ill, and the chronically ill, especially those with cardio-respiratory diseases. Typical sensitive receptors include residents, school children, hospital patients, and the elderly. The nearest sensitive area is the residential tract located across the river. The nearest of these homes is approximately 650 feet from the project site.

Standards of Significance

Thresholds for Construction Emissions

A review of the district's Guide for Assessing and Mitigating Air Quality Impacts indicates that the district considers PM10 to be the primary pollutant of concern from construction activities, and that compliance with district Regulation VIII will constitute sufficient mitigation to reduce PM10 emissions to less-than-significant levels. For the CEQA analysis, construction emission estimates were not quantified because the SJVUAPCD requires implementation of effective and comprehensive control measures rather than detailed quantification of emissions (San Joaquin Valley Unified Air Pollution Control District 2002). The amount of PM10 emitted during construction activities varies greatly depending on the level of activity, the specific operations taking place, the equipment being operated, soil characteristics, and weather conditions. Despite this variability in emissions, experience has shown that several feasible control measures can be reasonably implemented to reduce PM10 emissions during construction.

The SJVUAPCD has determined that compliance with its Regulation VIII Fugitive PM10 Prohibitions, including implementation of all feasible control measures specified in its Guide for Assessing Air Quality Impacts (San Joaquin Valley Unified Air Pollution Control District 2002), is sufficient mitigation to minimize adverse air quality effects from construction. Consequently, this air quality analysis assumes that the project applicant would comply with Regulation VIII. It also assumes that this compliance would be sufficient to eliminate any potentially substantial adverse air quality effects generated by construction activities.

The SJVAPCD recognizes that construction equipment also emits CO and ozone precursor emissions. However, the district has determined that these emissions may cause a significant air quality impact only in cases of very large or very intense construction projects. As previously noted under a., construction would be extremely limited, would occur for approximately 2 weeks, and would entail the augering of two holes to a depth of approximately 200 feet to install contactors. Consequently, construction activities are not considered large enough to result in significant emissions of ozone precursors.

Thresholds for Operational Emissions

Ozone precursor emissions (ROG and NOx) that exceed 10 tons per year are considered to have significant air quality impacts. Estimated CO concentrations exceeding the California Ambient Air Quality Standards (CAAQS) of 9 ppm averaged over 8 hours and 20 ppm for 1 hour will be considered a significant impact. The SJVAPCD has not established criteria for PM10 emissions, and if the rules included in Regulation VIII are followed, the district considers these emissions to be less than significant. However, because the area is nonattainment for the particulate standard, the criterion set forth in Rule 2201 (New and Modified Stationary Source Review Rule) is used here to determine significance. This value is 15 tons per year for PM10. This methodology is also in compliance with the California Air Resources Board (CARB) methodology, which states that if there is no established CEQA threshold, the analysis shall be based on the limitations set forth in the New Source Review limitations (*CEQA Review Handbook for Local Air Pollution Control Agencies*, ARB, March 1990).

Short-Term Air Quality Impacts

The SJVAPCD has the primary responsibility for the control of emissions in the County. Its regulations reflect all pertinent state and federal standards. Like all projects within the SJVAB, the project is subject to various District rules and regulations. Regulation VIII includes various control measures that reduce fugitive dust associated with construction, and its attendant PM10 and PM2.5. These measures are outlined in Rule 8021 (formerly Rule 8020), included within Regulation VIII, and list the requirements for dust abatement measures associated with construction, demolition, excavation, extraction, and other earthmoving activities. These measures, included below, are requisite for small-scale projects and as such do not constitute mitigation under CEQA.

- All disturbed areas, including storage piles, which are not being actively utilized for construction purposes, shall be effectively stabilized of dust emissions using water, chemical stabilizer/ suppressant, covered with a tarp or other suitable cover or vegetative ground cover.
- All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water of chemical stabilizer/suppressant.
- All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill and demolition activities shall be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking.
- With the demolition of buildings up to six stories in height, all exterior surfaces of the building shall be wetted during demolition.
- When materials are transported off-site, all material shall be covered, or effectively wetted to limit visible dust emissions, and at least six

inches of freeboard space from the top of the container shall be maintained.

- All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of each work day. (The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emission. Use of blower devices is expressly forbidden.)
- Following the addition of materials to, or removal of materials from, the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions utilizing sufficient water or chemical stabilizer/suppressant.
- Within urban areas, track-out shall be immediately removed when it extends 50 or more feet from the site and at the end of each workday.
- Any construction with 150 or more vehicle trips per day shall prevent carryout and track-out.

As noted above, the SJVAPCD's approach to CEQA analyses of construction impacts is to require implementation of effective and comprehensive control measures rather than to require detailed quantification of emissions. Implementation of all required control measures (Regulation VIII Control Measures) will constitute sufficient measures to ensure that PM10 impacts remain below a level considered significant.

Long-Term Air Quality Impacts

The project consists of an oxygenation demonstration project. Project operation is to take place for no more than 200 days over the course of 2 years. At the completion of construction, the project would require minimal inspection and maintenance. On-site personnel would generate no more than a few trips on a daily basis. Materials deliveries would involve one truck approximately every 6 days. Project emissions would be minimal and gaseous emissions would remain well under the 10-ton-per-year threshold value.

Microscale Projections

An impact is also potentially significant if emission levels exceed the state or federal ambient air quality standards. CO is produced in greatest quantities from vehicle combustion and does not readily disperse into the atmosphere. As such, adherence to ambient air quality standards is typically demonstrated through an analysis of localized CO concentrations. Because the project would generate only minimal vehicle trips associated with inspection and maintenance and occasional deliveries, it would not create or add to any CO violations, and any potential impact is less than significant.

Impact Analysis

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

Less-than-Significant Impact. Air emissions in SJVAB are regulated by the SJVAPCD. The SJVAPCD is required pursuant to the Clean Air Act to reduce emissions of criteria pollutants for which the district is in non-attainment. Strategies to achieve these emissions reductions are developed in *The Federal Ozone Attainment Demonstration Plan* (adopted November 14, 1994, and amended in 2001). This plan establishes the regulatory framework needed to bring the SJVAB into compliance with the national ozone standards as well as the California Clean Air Act. Attainment of the PM10 standards is addressed in the *2003 PM10 Attainment Demonstration Plan*. This plan establishes the regulatory framework to bring the SJVAB into compliance with the national PM10 standards by the end of the year 2010, as prescribed by the USEPA.

Individual projects and long-term programs within the region are required to be consistent with these Plans. The proposed project would not involve growth-inducing impacts or cause an exceedance of established population or growth projections and is consistent with the existing and surrounding land uses. Furthermore, the project would not produce either short- or long-term significant quantities of criteria pollutants or violate ambient air quality standards. Therefore, the project is consistent with the regional plans and the impact is considered less than significant. No mitigation measures are necessary.

b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Less-than-Significant Impact. Air pollutant emissions associated with the project could occur over the short term during site preparation and construction activities. Short-term emissions are then associated with the operation of the facility.

The project consists of the installation of an oxygenation demonstration project. Construction would be extremely limited in area and time, estimated at about 2 weeks. Construction would involve the augering of two holes to a depth of about 200 feet and the installation of the contactors. A 20-foot-square masonry structure would be installed to secure the equipment and provide an operations control room. Most of the equipment used in the operation of the project would be modular and would need only to be "assembled" on site. Equipment use would be relatively limited.

Subsequent to this construction, the project would only require minimal personnel for routine inspection and maintenance. LOX deliveries would be limited as the facility has the capacity to store 6 days' worth of materials. A single truck could deliver the necessary volume of LOX to fill the system to capacity, and no long-term impacts would occur.

c. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal

or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

Less-than-Significant Impact. The CEQA Guidelines require that projects be evaluated with respect to their contribution to the cumulative baseline conditions. This contribution with respect to air emissions would include both construction and operational emissions.

Cumulative projects include local development as well as general growth within the project area. However, as with most development, the greatest source of emissions is from mobile sources, which travel well outside the local area. Therefore, from an air quality standpoint, the cumulative analysis would extend beyond any local projects and when wind patterns are considered, would cover an even larger area. Accordingly, the cumulative analysis for the project's air quality must be generic by nature.

The project area is out of attainment for ozone. Construction and operation of cumulative projects will further degrade the local air quality. The greatest cumulative impact on the quality of regional air cell will be the incremental addition of pollutants mainly from increased traffic from residential, commercial, and industrial development and the use of heavy equipment and trucks associated with the construction of these projects.

The project does not result in the generation of significant short- or long-term emissions and would completely terminate after 2 years. As such, because the project does not result in significant air quality impacts, it does not result in a cumulatively significant impact.

d. Expose sensitive receptors to substantial pollutant concentrations?

Less-than-Significant Impact. As described above, project operations would not increase localized emissions or create a condition whereby these emissions exceed the air quality standards. As such, no significant impacts related to sensitive receptors are anticipated to occur, and no mitigation measures are necessary.

e. Create objectionable odors affecting a substantial number of people?

Less-than-Significant Impact. Project construction will involve the use of heavy equipment creating exhaust pollutants from boring and construction activities and from equipment bringing concrete and other building materials to the site. With regard to nuisance odors, any air quality impacts will be confined to the immediate vicinity of the equipment itself. By the time such emissions reach any sensitive receptor sites away from the project site, they will be diluted to well below any level of air quality concern. An occasional whiff of diesel exhaust from trucks accessing the site from public roadways may result. Such brief exhaust odors are an adverse, but not significant, air quality impact.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
IV.	**BIOLOGICAL RESOURCES.** Would the project:				
a.	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	❑	■	❑	❑
b.	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	❑	❑	■	❑
c.	Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marshes, vernal pools, coastal wetlands, etc.) through direct removal, filling, hydrological interruption, or other means?	❑	❑	❑	■
d.	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	❑	❑	■	❑
e.	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	❑	❑	❑	■
f.	Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?	❑	❑	❑	■

Setting

The DWSC is located in the tidal portion of the San Joaquin River at the eastern edge of the Sacramento–San Joaquin Delta. The waterways of the Delta have been severely affected by nonnative aquatic species. Fishes of the Delta are predominantly introduced species, including striped bass, catfishes, sunfishes,

crappie, threadfin shad, and carp (Herbold et al 1991). Bottom animals include several introduced species of crayfish and clams, which often occur in high densities. Populations of many invertebrates and most fishes in the Delta have declined in the past three decades (Herbold et al 1991). Invertebrates that have shown declines include planktonic species such as rotifers, cladocerans and native copepods that form the prey base for fishes. Among the fishes, populations of delta smelt and splittail have declined to extremely low levels. Striped bass and Chinook salmon have declined to the point where their fisheries are now at only a fraction of what they were 20 to 30 years ago. Even supposedly robust resident introduced fish species, such as threadfin shad and white catfish, appear to have declined in abundance (Herbold et al 1991).

Project construction and operation activities will occur on the dock, in the water channel, and on approximately 0.1 acre of highly disturbed upland area adjacent to the channel. The upland area that will be affected by project activities is partially paved, with patches of ruderal vegetation. Project activities will occur well away from the channel bank and thus will not affect vegetation along the bank. No special-status plant species will be affected by this project.

A survey was performed at the project site to determine the presence of sensitive species and habitat. None were found at the site; the only occurrence was a single elderberry bush south of the project site (Wingfield pers. comm.). This bush, a potential host plant to the threatened valley elderberry longhorn beetle, is far outside the work site area and will not be affected by project activities.

Special-Status Species

An official list of special-status species potentially occurring in the project region was requested from the USFWS on January 26, 2005. The list includes all special-status species that occur in the greater project region, covered by the following quad maps: Stockton West, Stockton East, Holt, Lathrop, and Lodi South.

Of the species included in this list, only seven have the potential to be affected by the project. These include five species of fish and two species of birds. Table 5 lists these special-status species that could be affected by the proposed project.

Table 5. Special-Status Species That Could Be Affected by the Project

Scientific Name	Common Name	Status*
Acipenser medirostris	Green sturgeon	FC, SSC
Hypomesus transpacificus	Delta smelt	FT, ST
Oncorhynchus tshawytscha	Chinook salmon	
	Winter run	FE, SE
	Spring run	FT, ST
	Central Valley fall/late-fall run	FC, SSC
Oncorhynchus mykiss	Steelhead	
	Central Valley evolutionarily significant unit (ESU)	FT
Pogonichthys macrolepidotus	Splittail	SSC
Buteo Swainsoni	Swainson's hawk	SSC
Athene cunicularia hypugaea	Western burrowing owl	SC

Status Legend:
FE = Federal Endangered
FT = Federal Threatened
SE = State Endangered, **ST** = State Threatened
FC = Federal Candidate
SSC = State Species of Concern

The project area itself is adjacent to a busy dock, which is routinely subject to human disturbance from traffic, loading and unloading, and other dock activities. Further, the upland area adjacent to the channel is highly disturbed. In part for these reasons, the project area is not good habitat for sensitive plants and wildlife species, and they do not tend to occur there.

Table 6 lists special-status species not being considered in this Initial Study. These species were eliminated from consideration for the following reasons:

- They do not occur in or utilize the project area, due to a lack of appropriate habitat for the species in the project area;
- They are not known to occur in the project area based on survey evidence."

The following section discusses the sensitive species that could potentially be affected by the project.

Green Sturgeon (*Acipenser medirostris*)

Federal Candidate, State Species of Special Concern—Sturgeon are anadromous fishes that spend most of their lives in saltwater and come into fresh

water to spawn. Green sturgeon are the most marine species of sturgeon, coming into rivers mainly to spawn, although early life stages in fresh water may last as long as 2 years (Moyle 2002). The San Francisco Bay estuary supports the southernmost reproducing population of green sturgeon, which spawn in the Sacramento River (Moyle and Yoshiyama 1992). The largest spawning population of green sturgeon in California is in the Klamath River Basin. Green sturgeon are observed in the San Joaquin River in some years, and juvenile green sturgeon have been collected at Mossdale Landing upstream from the DWSC (San Joaquin Council of Governments 2001). They could pass through the DWSC.

Delta Smelt (*Hypomesus transpacificus*)

Federal Threatened, State Threatened—Delta smelt are endemic to the upper San Francisco Estuary, primarily the Delta and Suisun Bay. They occur in the Delta primarily below Isleton on the Sacramento River side and below Mossdale on the San Joaquin River side (Moyle 2002). Because they are not strong swimmers, they typically occupy open, shallow waters (<3 m) (Jones & Stokes 2003). Delta smelt rear mostly in or just upstream of the region where fresh water and brackish water mix. This zone may be hydraulically conducive to their ability to maintain position. U.S. Fish and Wildlife Service (USFWS) designated critical habitat for delta smelt includes the entire San Joaquin River estuary (San Joaquin Council of Governments 2001).

Delta smelt begin migration upstream, which may take several months, toward areas of the upper Delta during September and October (Jones & Stokes 2003). Spawning occurs between February and July, with the peak in April through mid-May, in shallow edgewaters in the upper Delta and Sacramento River upstream of Rio Vista. Eggs are broadcast over the bottom, where they attach to substrate and vegetation. Hatching takes approximately 9 to 13 days, and feeding occurs 4 to 5 days later. Smelt larvae contain a large oil globule that makes them semi-buoyant, which allows them to stay off the bottom, and feed on rotifers and other zooplankton. As their fins develop, they move up in the water column. At this point, most are washed downstream toward the mixing zone, where they are strong enough swimmers to move up and down in the water column depending on where the food source is located.

Although the deep waters of the DWSC represent inappropriate spawning habitat for delta smelt, delta smelt would be expected to migrate through the project area. For example, Rockriver and Dege (2001) reported large catches of delta smelt in the DWSC in 2001.

Chinook Salmon (*Oncorhynchus tshawytscha*)

Chinook salmon are anadromous fishes that spawn in fresh water and spend their adult lives in the ocean. After maturing in the ocean, adult Chinook salmon migrate through the San Francisco estuary to spawn in the streambed gravels of

the Sacramento River and its tributaries and in the San Joaquin River tributaries (Monroe and Kelly 1992). There are four genetically distinct Central Valley runs designated by the season in which they enter fresh water to spawn: a fall run that enters fresh water during July through November and begins spawning in October; a late-fall run that moves upstream during October through February and begins spawning in January; a winter run that moves upstream during January through June and begins spawning in April; and a spring run that moves upstream during March through July and begins spawning in August.

- **Sacramento River Winter Run Chinook Salmon—Federal Endangered, State Endangered**. Winter-run Chinook salmon historically spawned in the upper Sacramento River and its major tributaries, the McCloud and Pit Rivers (Jones & Stokes 2004). The construction of Shasta Dam blocked access to historical habitat and restricted spawning to the mainstem Sacramento River immediately downstream. Although winter-run Chinook salmon do not spawn in the San Joaquin River, it is possible that winter-run salmon traveling to or from the Sacramento River could occur in the DWSC.

- **Central Valley Spring Run Chinook Salmon —Federal Threatened, State Threatened.** Spring-run Chinook salmon in the Sacramento–San Joaquin river system historically made up one of the largest sets of runs on the Pacific coast (Moyle 2002). Runs in the upper San Joaquin River may have exceeded 200,000 fish, and an equal number of salmon probably spawned in the Merced, Tuolumne, and Stanislaus Rivers (Moyle 2002). When Friant Dam was constructed in 1948, salmon spawning in the San Joaquin River drainage were cut off from their upstream spawning grounds, and the San Joaquin spring run became extinct. Large numbers of spring-run Chinook salmon also spawned in the upper Sacramento River and its tributaries. The principal habitats remaining open to Sacramento River spring-run Chinook salmon are Deer, Mill, and Butte Creeks (Moyle 2002). Small numbers of salmon also spawn in other tributary streams such as Antelope and Big Chico Creeks, and a few salmon may spawn in the mainstem Sacramento River. The Feather River Fish Hatchery sustains the spring-run population on the Feather River (Jones & Stokes 2003). Because spring-run Chinook salmon no longer spawn in the San Joaquin River system, individuals from this population would not be expected to use the DWSC regularly. However, because individuals from the Sacramento River drainage population potentially could occur in the project area, the project area is USFWS designated critical habitat.

- **Central Valley Fall-Run/Late –Fall–Run Chinook Salmon —Federal Candidate, State Species of Special Concern.** Fall-run Chinook salmon are currently the most abundant run in the Central Valley. Historical spawning areas are downstream from most Central Valley dams, and as a result this run has not been as severely affected by dam construction as the spring and winter runs, which historically spawned at higher elevations (Jones & Stokes 2003). Fall-run Chinook salmon spawn in both the Sacramento and San Joaquin drainages. In the San

Joaquin River system, fall-run Chinook salmon currently spawn only in the larger tributaries of the lower San Joaquin River. Fall runs from both drainages are heavily supplemented by hatchery fish (Moyle 2002). Late fall–run Chinook salmon presently spawn only in the Sacramento River system, although historically they probably occurred in both systems (Moyle 2002).

Chinook salmon that occur in the DWSC generally would be fall-run salmon because that is the only population that still spawns in the San Joaquin River drainage. Appropriate spawning habitat does not occur in the project area. Fall-run Chinook salmon would be expected to use the DWSC as a migratory corridor.

Central Valley Steelhead Evolutionarily Significant Unit (*Oncorhynchus mykiss*)

Federal Threatened. Steelhead are the anadromous form of rainbow trout. Steelhead spawn in fresh water and spend their adult lives in the ocean. Steelhead once were widely distributed in the Sacramento and San Joaquin drainages, but construction of dams cut them off from historical spawning habitat (Moyle 2002). The principal remaining wild populations are in Deer and Mill Creeks and the Yuba River in the Sacramento River system. With the possible exception of a small population in the lower Stanislaus River, steelhead appear to have been extirpated from the San Joaquin River drainage (Moyle 2002). Hatchery-reared steelhead also occur in the Central Valley drainages. A few wild steelhead are captured in the lower San Joaquin River each year (Burmester 2001). In 2001, seven wild juvenile steelhead were collected in the San Joaquin River at Mossdale upstream from the DWSC. The project area is USFWS designated critical habitat. Low numbers of Central Valley steelhead would be expected to occur in the project area in migration.

Sacramento Splittail (*Pogonichthys macrolepidotus*)

State Species of Special Concern. Splittail are large minnows that are found primarily in the Delta, Suisun Bay, and the lower portions of the Sacramento and San Joaquin Rivers. Historically, they ranged much farther upstream in the Sacramento and San Joaquin Rivers and their tributaries. However, in 1998, splittail were captured in the San Joaquin River at Fremont Ford, just upstream of the confluence with the Merced River (Jones & Stokes 2003). Splittail are likely to use the upper San Joaquin River, potentially for spawning and rearing during high-flow years. The east side of the river, for approximately 8 miles upstream of the Merced River, has setback levees that flood during high flows. These are used for spawning and rearing. Splittail spawn in the lower reaches of the Sacramento and San Joaquin Rivers between early March and May. Splittail use the project area as a migration corridor during upstream and downstream migration and possibly as rearing habitat (Jones & Stokes 2003). Water depth in

the DWSC averages approximately 37 feet at low tide, and the channel lacks riparian vegetation and complexity. The DWSC does not provide appropriate spawning habitat, and rearing habitat is of poor quality.

Swainson's Hawk (*Buteo swainsoni*)

The Swainson's hawk is listed by DFG as a threatened species. It has no federal status, but is protected under the Migratory Bird Treaty Act. No critical habitat has been designated for this species. Swainson's hawks are a highly migratory species, typically breeding in North America and overwintering in South America. They breed from just west of the Mississippi River to the coastal range of California, from just south of the Mexican border to Canada and Alaska. In October, Swainson's hawks migrate south, and although little is known about the location of their wintering grounds, some reach the southern tip of Argentina and may travel in excess of 14,000 miles on their round-trip journey.

The Swainson's hawk is a migratory raptor of the plains and prairies and is present in the Central Valley from approximately March/April through September/October. In the Central Valley, these birds are found in and around open habitats such as grassland and agricultural fields. They typically nest in large trees within efficient flying distance of suitable foraging habitat. In the Central Valley, Swainson's hawks arrive at their breeding grounds between early March and early April. They mate and construct nests through April and typically lay eggs in late April to early May. The eggs hatch in 28 to 30 days. With sufficient food, the young grow rapidly and fledge about 40 days later, usually in early to mid July (Bradbury pers. comm.). The fledgling(s) remain close to the nest site for another month, begging for food from the adults. Finally they join with other young and adults, and move up and down the valley feeding in freshly mowed or disked fields, often in very large groups of 100 or more. In late September to early October, both adults and juveniles begin their southern migration. The Swainson's hawk population in California has declined by more than 90% since the turn of the century (Bloom 1980). DFG (1994c) attributes the decline of Swainson's hawk numbers in California to the loss of native nesting and foraging habitats, and more recently, to the conversion of agricultural lands to urban areas and incompatible agricultural crops. In addition, pesticides, shooting, disturbances at the nest site, and impacts on wintering areas may have contributed to the population decline. Swainson's hawks could potentially occur in the project area.

Western Burrowing Owl (*Athene cunicularia hypugaea*)

State Species of Special Concern. The western burrowing owl is a permanent resident throughout the Delta. Suitable habitat for burrowing owls occurs in ruderal habitats and in the vicinity of agricultural lands. The western burrowing owl nests and roosts in abandoned ground-squirrel and other small-mammal

burrows, as well as artificial burrows, such as culverts, concrete slabs, and debris piles. The owl's breeding season is from March to August, peaking in April and May. Burrowing owls could potentially occur in the project area.

Table 6. Species from the U.S. Fish and Wildlife Service List That Are Not Being Considered in This Initial Study

Scientific Name	Common Name	Status*
Amphibians		
Rana aurora draytonii	California red-legged frog	T
Ambystoma californiense	California tiger salamander	T
Spea hammondii	western spadefoot toad	SC
Birds		
Haliaeetus leucocephalus	bald eagle	T
Toxostoma redivivum	California thrasher	SC
Buteo regalis	ferruginous hawk	SC
Carduelis lawrencei	Lawrence's goldfinch	SC
Melanerpes lewis	Lewis's woodpecker	SC
Lanius ludovicianus	loggerhead shrike	SC
Numenius americanus	long-billed curlew	SC
Limosa fedoa	marbled godwit	SC
Charadrius montanus	mountain plover	SC
Selasphorus rufus	rufous hummingbird	SC
Agelaius tricolor	tricolored blackbird	SC
Chaetura vauxi	Vaux's swift	SC
Plegadis chihi	white-faced ibis	SC
Elanus leucurus	white-tailed (=black-shouldered) kite	SC
Picoides nuttallii	Nuttall's woodpecker	SLC
Grus canadensis tabida	greater sandhill crane	CA
Empidonax traillii brewsteri	little willow flycatcher	CA
Branta canadensis leucopareia	Aleutian Canada goose	D
Falco peregrinus anatum	American peregrine falcon	D
Fish		
Lampetra hubbsi	Kern brook lamprey	SC
Spirinchus thaleichthys	longfin smelt	SC
Lampetra tridentata	Pacific lamprey	SC
Lampetra ayresi	river lamprey	SC
Invertebrates		
Lepidurus packardi	vernal pool tadpole shrimp	E
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	T

Scientific Name	Common Name	Status*
Branchinecta lynchi	vernal pool fairy shrimp	T
Anthicus antiochensis	Antioch Dunes anthicid beetle	SC
Linderiella occidentalis	California linderiella fairy shrimp	SC
Branchinecta mesovallensis	Midvalley fairy shrimp	SC
Lytta molesta	molestan blister beetle	SC
Anthicus sacramento	Sacramento anthicid beetle	SC
Mammals		
Neotoma fuscipes riparia	riparian (San Joaquin Valley) woodrat	E
Sylvilagus bachmani riparius	riparian brush rabbit	E
Vulpes macrotis mutica	San Joaquin kit fox	E
Eumops perotis californicus	greater western mastiff-bat	SC
Myotis volans	long-billed curlew	SC
Corynorhinus (=Plecotus) townsendii townsendii	Pacific western big-eared bat	SC
Perognathus inornatus	San Joaquin pocket mouse	SC
Myotis ciliolabrum	small-footed myotis bat	SC
Myotis yumanensis	Yuma myotis bat	SC
Reptiles		
Thamnophis gigas	giant garter snake	T
Phrynosoma coronatum frontale	California horned lizard	SC
Clemmys marmorata marmorata	northwestern pond turtle	SC
Masticophis flagellum ruddocki	San Joaquin coachwhip (=whipsnake)	SC
Anniella pulchra pulchra	silvery legless lizard	SC
Clemmys marmorata pallida	southwestern pond turtle	SC
Plants		
Cordylanthus palmatus	palmate-bracted bird's-beak	E
Castilleja campestris ssp. *succulenta*	succulent (=fleshy) owl's-clover	T
Astragalus tener var. *tener*	alkali milk-vetch	SC
Lathyrus jepsonii var. *jepsonii*	delta tule-pea	SC
Lilaeopsis masonii	Mason's lilaeopsis	SC
Atriplex joaquiniana	San Joaquin spearscale (=saltbush)	SC
Cirsium crassicaule	slough thistle	SC
Sagittaria sanfordii	valley sagittaria (=Sanford's arrowhead)	SC
Eryngium racemosum	delta coyote-thistle (=button-celery)	CA

Scientific Name	Common Name	Status*

Status Legend:
E = Federal Endangered
T = Federal Threatened
SC = Species of Concern
D = Delisted Species
CA = Listed by the State of California, but not the USFWS
SLC = Species of Local Concern; Other species of concern to the Sacramento Fish & Wildlife Office

Impact Discussion

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

Less than Significant Impact with Mitigation Incorporated. As described above under Setting, a number of special-status fish species have the potential to occur in the project area. Of the special-status species with the potential to occur in the project area, delta smelt, fall-run Chinook salmon, and splittail are most likely to occur regularly. The intake and diffuser sections of the proposed aeration device would be installed along the pilings of Dock 20. Installation of these structures would involve minimal disturbance to the aquatic habitat of the DWSC, and impacts on special-status species would be less than significant.

The intake of the aeration device has the potential to affect sensitive fish species by impingement, in which fish become pinned against the intake screen, or entrainment, in which small fish pass through the mesh of the intake screen into the pumps. To avoid impingement and entrainment impacts, the fish screens have been designed to meet standards of NOAA Fisheries, U.S. Fish and Wildlife Service, and the DFG. The screens will be designed to have an approach velocity not to exceed 0.2 foot per second. This gentle velocity would prevent fish from being drawn into the screens, and impingement would be avoided. The screens will have slot openings of 1.75 mm to prevent fry, juvenile, and fingerling fish from entering the intake. With the incorporation of this intake design, impingement and entrainment impacts on sensitive fish species would be mitigated to less than significant.

Oxygen will be discharged to the DWSC through a diffuser system. There is concern that high levels of oxygen in the discharge may be harmful to fishes. For example, the initial concentration of oxygen at the discharge would be 43 to 66 mg/l. However, the diffuser system will dilute initially high oxygen concentrations by a ratio of 10:1. Therefore, the oxygen concentrations at the diffuser would be well within the tolerance limits of aquatic organisms (oxygen would be 4.3 to 6.6 mg/l). In the long run, successful aeration of the DWSC would prevent low DO levels in the DWSC and enhance it as a habitat for sensitive fishes and other aquatic life.

There is a slight chance that during construction or maintenance of the aeration device, an accident could occur that would result in the release of fuels to the waters of the DWSC. BMPs (such as conducting all fueling of vehicles and transfer of hazardous substances away from the water) would be employed during all operations on Dock 20 to reduce the chances that a spill or release of contaminants could result in introduction of pollutants to the DWSC. In addition, a spill containment and cleanup plan will be prepared to ensure that if a spill does occur, it is contained and cleaned up as rapidly and efficiently as possible. With the implementation of BMPs and preparation of a spill containment and cleanup plan, the chances of a spill resulting in levels of contaminants that would be harmful to sensitive fishes would be less than significant.

During the breeding and nesting season, Swainson's hawks and burrowing owls could potentially be affected by project activities that occur on the upland area adjacent to the channel, such as drilling and installation of the U-Tubes and LOX tank. In order to avoid impacts on these birds, surveys would be conducted before starting project activities if construction is to occur between March 1 and August 31. A survey for burrowing owl nests would be done in the immediate vicinity of the project site, while the survey for Swainson's hawk nests would encompass a 1/4-mile area around the project site. Burrowing owl nests would be flagged and avoided to the maximum extent possible. Locations of Swainson's hawk nests within 1/4 mile of the project site would be reported to DFG.

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

Less than Significant. The project area is designated critical habitat for Central Valley spring-run Chinook salmon, Central Valley steelhead, and delta smelt. However, aeration of the water channel by project activities will improve habitat for these species. Thus, the project will actually have a beneficial impact on this designated critical habitat.

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

No Impact. The aeration device would be installed on a dock. No natural vegetation would be disturbed by the proposed project.

d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Less than Significant. The proposed aeration device would be installed on a dock and would not likely affect terrestrial wildlife. No native fishes breed in the project area. Several species of native fishes, in particular delta smelt, splittail, and fall-run Chinook salmon, use the DWSC for migration. There is a potential

that native fishes, especially the younger life stages, could become impinged or entrained by the intake. To avoid impingement and entrainment impacts the fish screens have been designed to meet standards of NOAA Fisheries and the DFG. The screens will be designed to have an approach velocity not to exceed 0.2 foot per second. This gentle velocity would prevent fish from being drawn into the screens and impingement would be avoided. The screens will have slot openings of 1.75 mm to prevent fry, juvenile, and fingerling fish from entering the intake. With this intake design, impingement and entrainment impacts on migrating fishes would be less than significant.

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

No Impact. The experimental aeration of waters of the DWSC would not conflict with any local policies or ordinances protecting biological resources.

f. Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?

No Impact. The experimental aeration of waters of the DWSC would not conflict with the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
V.	**CULTURAL RESOURCES.** Would the project:				
a.	Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?	❑	❑	❑	■
b.	Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	❑	❑	❑	■
c.	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	❑	❑	❑	■
d.	Disturb any human remains, including those interred outside of formal cemeteries?	❑	❑	❑	■

Setting

The proposed project would be located on Dock 20, Port of Stockton West Complex, on Rough and Ready Island. Prior to the 1940s, the island was used for bulk petroleum storage in the northern and eastern portions, and farming on the southern. In 1945, the island was developed as the U.S. Navy Supply Annex (NSA), a major supply depot. In 1960, the Naval Communications Stations (NCS) Stockton (recently renamed the Naval Computer and Telecommunications Station, San Diego, Detachment Stockton) moved its headquarters to Rough and Ready Island. The NSA Stockton was deactivated in 1965, and control of the Island was subsequently assigned to the NCS Stockton. In January 1996 a draft Historic and Archeological Resources Protection (HARP) plan was completed for NCS Stockton property and structures located on Rough and Ready Island. The HARP plan concluded that because 90% of the World War II base still exists, the entire base has historic integrity and would qualify for inclusion in the National Register of Historic Places (NRHP) as a historical district. The HARP plan was finalized and submitted to the State Historic Preservation Officer (SHPO) in November 1996. In December 1996, the SHPO concurred with the Navy that a historic district referred to as the Naval Supply Annex Stockton Historic District, exists on Rough and Ready Island and that this district appears eligible for listing in the NRHP.[3] The proposed project site is currently used for large ship cargo transport and storage.

[3] Ibid.

Impact Discussion

a. Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?

No Impact. Dock 20 is not identified as a historical resource as defined in § 15064.5. Therefore, the proposed project would have no impact on historical resources.

b.,c. Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5? Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

No Impact. No prehistoric sites or paleontological resources have been reported on or adjacent to Rough and Ready Island. Therefore, the proposed project would have no impact on archaeological or paleontological resources.

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

No Impact. The proposed project would be situated on Dock 20. The aeration process would take place in the DWSC, outside of any feasible area for contact with human remains. The project would have a less-than-significant impact on this issue area.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
VI.	**GEOLOGY AND SOILS.** Would the project:				
a.	Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
	1. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	❑	❑	■	❑
	2. Strong seismic groundshaking?	❑	❑	■	❑
	3. Seismic-related ground failure, including liquefaction?	❑	❑	■	❑
	4. Landslides?	❑	❑	❑	■
b.	Result in substantial soil erosion or the loss of topsoil?	❑	❑	❑	■
c.	Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project and potentially result in an on-site or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	❑	❑	❑	■
d.	Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1997), creating substantial risks to life or property?	❑	❑	❑	■
e.	Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater?	❑	❑	❑	■

Setting

The proposed project would be located on Dock 20 in the Port of Stockton West Complex in an area zoned for Port Industrial uses and characterized by large ship-unloading facilities, material transportation equipment, and parking areas. The main infrastructure of the project would be constructed on the dock with some piping connected to the pier and extending into the channel.

The project vicinity consists of an island feature situated within the low-lying floodplains just east of the San Joaquin Delta. The surrounding topography is characteristic of a highly dissected alluvial plain with numerous river systems meandering to the west, including the San Joaquin and Calaveras Rivers. The West Complex is located on a nearly level surface with elevations ranging from 10 feet below mean sea level (msl) to +15 feet msl along the perimeter levee (United States Geological Survey 1987). The West Complex is currently protected from flooding through a series of levees that surround the perimeter of the island and provide 100-year flood protection.[4]

Impact Discussion

a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving: (i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault. Refer to Division of Mines and Geology Special Publication 42; (ii) Strong seismic ground shaking; (iii) Seismic-related ground failure, including liquefaction; (iv) Landslides?

Less than Significant/No Impact. Implementation of the proposed project could expose people and/or structures to potential adverse effects of seismically induced groundshaking, and/or seismic-related ground failure; however, local ordinances require implementation of measures that will reduce this risk. This is a less-than-significant impact. In addition, the project area is nearly level; therefore, landslides are not a risk in this area.

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

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

No Impact. Dock 20, the project location, is completely built-out with industrial improvements and is not located on an unstable geologic unit.

d.,e. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1997), have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

No Impact. The project site is not located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1997)[5], and the project design does not include the use of septic tanks or alternative wastewater disposal systems.

[4] Ibid.

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

Setting

The proposed project would be located on Dock 20 in the Port of Stockton West Complex in an area zoned for Port Industrial uses and characterized by large ship-unloading facilities, material transportation equipment, and parking areas. Part of the project would include a 9,000-gallon aboveground storage tank (AST) containing LOX. The main infrastructure of the project would be constructed on the dock with some piping connected to the pier and extending into the channel.

Impact Discussion

a., b Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials; create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Less than Significant. The proper handling and storage of hazardous materials will significantly decrease the chances of a release of the any hazardous materials used during construction activities or operation of the proposed project. The proper precautions and BMPs at the site will ensure that an unauthorized release of LOX or any hazardous material on site will not occur.

Many of the businesses currently located in the vicinity of Dock 20 store and use hazardous materials and generate hazardous wastes during the course of daily operations. Businesses that will be developed in the project vicinity in the future may also store and use hazardous materials and generate hazardous wastes during the course of daily operations.

In addition, federal, state, and local governmental agencies have hazardous material inventory requirements that will apply to the proposed project. The State Office of Emergency Services has developed a single comprehensive hazardous materials inventory form for businesses to use to submit their hazardous materials inventories. The state form contains all state- and federally required inventory information. The use of this form will meet state and federal reporting requirements. San Joaquin County has a hazardous waste management plan (that was adopted by the City of Stockton) that serves as the primary planning document for hazardous waste management in the County. Beyond that, the buildings must meet all building and fire codes to be permitted. Hazardous materials and wastes, if used and/or stored in regulated quantities, require permits and a California Environmental Protection Agency (CalEPA) number. The San Joaquin County Environmental Health Division (SJCEHD) requires a hazardous material management plan (HMMP), and the Stockton Fire Department will require an inventory statement and facility map describing the location and amount of all hazardous materials and waste in use and/or in storage. The San Joaquin County Office of Emergency Services and SJCEHD also have similar requirements, as well as requirements for shipped materials and materials that are stored for shipment. In addition, the City of Stockton and San

Joaquin County regulatory agencies have in place provisions for handling emergency situations resulting from the release of hazardous substances onto the ground, into surface water or groundwater, or into the air. The above stated management practices will greatly lessen the potential for risk of hazardous material exposure to the public originating from the project site and vicinity.

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

No Impact. The project design does not contain elements that would emit hazardous waste or use, store, or generate acutely hazardous material. In addition, no existing or proposed schools are located within ¼ mile of the proposed project.

d. Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

Less than Significant. The proposed project is located on Rough and Ready Island, a listed hazardous material site pursuant to Government Code Section 65962.5; however, the specific site location does not have a history of unauthorized releases of hazardous materials or contamination of any kind. As stated above, BMPs regarding the use, generation, or storage of hazardous materials greatly lessen the potential for risk of hazardous material exposure to the public originating from the project site and vicinity.

e, f. Be located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area; be within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?

No impact. The proposed project is not located within an airport land use plan, or in the vicinity of a private airstrip. Furthermore, the project has no design element that would interfere with air traffic.

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

No Impact. The proposed project has no physical characteristics that would interfere with an adopted emergency response plan or emergency evacuation plan.

h. expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

No Impact. The proposed project would be located in an industrial area that is not in the vicinity of wildlands of any kind.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
VIII.	**HYDROLOGY AND WATER QUALITY.** Would the project:				
a.	Violate any water quality standards or waste discharge requirements?	❑	❑	■	❑
b.	Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?	❑	❑	❑	■
c.	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on site or off site?	❑	❑	❑	■
d.	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on site or off site?	❑	❑	❑	■
e.	Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	❑	❑	❑	■
f.	Otherwise substantially degrade water quality?	❑	❑	■	❑
g.	Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	❑	❑	❑	■
h.	Place within a 100-year flood hazard area structures that would impede or redirect floodflows?	❑	❑	❑	■

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
i.	Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?	❑	❑	❑	■
j.	Contribute to inundation by seiche, tsunami, or mudflow?	❑	❑	❑	■

Setting

The DWSC is a portion of the San Joaquin River that is maintained by dredging to accommodate large ships. The DWSC, which begins at the mouth of the river near Antioch and terminates in Stockton at the Port of Stockton East Complex, provides large hauling vessels access to the interior of the Central Valley from the open ocean. The DWSC is approximately 500–700 feet wide and is dredged to a depth of at least 35 feet mean lower low water (Jones & Stokes 2004). A sizable turning basin in the Port of Stockton allows vessels to reverse their course for the return journey to the coast.

The DWSC is tidally influenced with an average tidal stage change of 2 to 3 feet (Jones & Stokes 2004). Water moves upstream or downstream about 1 mile during a 3-foot tidal variation, which may occur twice each day.

Average water flows through the DWSC range from 500 to 2000 cfs with hydraulic travel time of approximately 4 to 12 days between Channel Point and Turner Cut (HDR 2004). During the months of June through September flows may be as low as 250 cfs with travel times of approximately 32 days. Peak flows are observed in February and March with relatively low flows occurring June through December.

Section 303(d) of the Federal Clean Water Act requires that states develop a list of impaired water bodies that need additional work beyond existing controls to achieve or maintain water quality standards. The State Water Resources Control Board (SWRCB) has listed the DWSC as impaired for the following pollutants or parameters: chlorpyrifos, DDT, diazinon, Group A pesticides, mercury, unknown toxicity and organic enrichment/low DO (SWRCB 2003). The pesticides (chlorpyrifos, DDT, diazinon, Group A pesticides) are from agriculture and urban runoff, and the mercury is from mining activities.

Water quality in the DWSC has received particular attention because of the chronically low DO levels (ESA 2003). The concentration of DO in the DWSC is a function of three primary factors: variations in flow conditions in the river, the geometry of the DWSC (particularly its depth), and upstream contributions of algae and oxygen-depleting constituents (e.g., biochemical oxygen demand and

ammonia) (Jones & Stokes 2004). High San Joaquin River flows of greater than 2,000 cfs can prevent low DO by diluting oxygen-depleting substances in the DWSC and transporting these substances quickly through the DWSC. The depth of the San Joaquin River increases from 8 to 10 feet in the river to 35 to 40 feet in the DWSC and the river widens in the DWSC. The increased width and depth in the DWSC cause San Joaquin River flows to slow through the ship channel, thus increasing the residence time of water and associated algae and other oxygen-demanding substances. The growing algae at the surface can provide DO to the DWSC through photosynthesis, but the net effect of the algae is to reduce DO as the algae respire and bacteria decompose dead algae. During the summer and fall when residence times in the DWSC increase because of decreased flows as a result of seasonal variation and water diversions, the lack of aeration leads to DO levels that are too low to adequately support aquatic life (ESA 2003).

Impact Discussion

a. Violate any water quality standards or waste discharge requirements?

Less than Significant. The proposed project would not discharge any contaminants into the DWSC that would violate any water quality standards. The proposed project is designed to discharge oxygen. The oxygen would be discharged through a diffuser section that would dilute the concentration of oxygen in the discharge by a factor of 10. Therefore, DO concentrations in the water column would not be at levels that could be harmful to aquatic species. The DWSC currently does not meet water quality standards for DO much of the time. Therefore, in the long term the proposed project is designed to address the water quality problem of low DO and enable the DWSC to meet the standard for DO. Therefore, the long-term impact on water quality of the proposed project would be beneficial.

The intake and diffuser sections would be installed on the pilings of Dock 20 on Rough and Ready Island. The structures would be above the seafloor. Therefore, installation and operation of the proposed aeration device would not resuspend sediments and release any contaminants in the sediments to the water column. Divers would be used during the construction of the intake and outtake and may disturb a minor amount of sediment. Disturbance of sediment by divers during project construction would be short term and localized. Impacts would be less than significant.

There is a slight chance that during construction or maintenance of the aeration device, an accident could occur that would result in the release of fuels to the waters of the DWSC. BMPs (such as conducting all fueling of vehicles and transfer of hazardous substances away from the water) would be employed during all operations on Dock 20 to reduce the chances that a spill or release of contaminants could result in introduction of pollutants to the DWSC. In addition, a spill containment and cleanup plan will be prepared to ensure that if a spill does occur, it is contained and cleaned up as rapidly and efficiently as possible. With the implementation of BMPs and preparation of a spill containment and cleanup

plan, the chances of a spill resulting in a violation of water quality standards would be less than significant.

b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?

No Impact. The proposed project would have no effect on groundwater supplies.

c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on site or off site?

No Impact. The proposed project would not alter the drainage pattern of the site area or alter the course of a stream or river in a manner that would result in substantial erosion or siltation on site or off site.

d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on site or off site?

No Impact. The proposed project would not alter drainage or runoff amounts or patterns or alter the course of a stream or river.

e. Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

No Impact. The proposed project would not create or contribute runoff water. Therefore, there would be no impact on runoff.

f. Otherwise substantially degrade water quality?

Less than Significant. As discussed above under a., the proposed project would not result in the discharge of any pollutants. The proposed discharge of oxygen would improve water quality in the DWSC. Installation of the aeration device would not involve placing any structures on the bottom of the DWSC. Therefore, resuspension of bottom sediments during construction would not have the potential to degrade water quality.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
IX.	**LAND USE AND PLANNING.** Would the project:				
a.	Physically divide an established community?	❑	❑	❑	■
b.	Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	❑	❑	❑	■
c.	Conflict with any applicable habitat conservation plan or natural community conservation plan?	❑	❑	❑	■

Setting

The proposed project would be located on Dock 20 in the Port of Stockton West Complex in an area zoned for Port Industrial uses and characterized by large ship-unloading facilities, material transportation equipment, and parking areas.

Impact Discussion

a. Physically divide an established community?

No Impact. The proposed project would have no effect on land uses; therefore, there would be no impact.

b. Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

No Impact. The proposed project is in compliance with the Port Industrial land uses for the area in which it would be located. Therefore, there would be *no impact* on the applicable land use plans, policies, or regulations.

c. Conflict with any applicable habitat conservation plan or natural community conservation plan?

No Impact. The experimental aeration of waters of the DWSC would not conflict with the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
X.	**MINERAL RESOURCES.** Would the project:				
a.	Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	❑	❑	❑	■
b.	Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	❑	❑	❑	■

Setting

The proposed project is an aeration demonstration project that would be located on Dock 20 in the Port of Stockton West and would be designed to:

- transfer 10,000 lbs O_2/day to the DWSC,
- evaluate water quality benefits associated with the delivery of 10,000 lbs O_2/day,
- collect key design parameters to better understand their relationship to U-Tube transfer efficiency, and
- gather additional information on impacts that may occur as an unintended consequence of large-scale aeration.

Impact Discussion

a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

No Impact. The proposed project would have no effect on known mineral resources; therefore, there would be no impact.

b. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

No Impact. The proposed project would have no effect on any mineral resource recovery site; none are delineated in the current Redevelopment Plan or zoning ordinances that control land uses in vicinity of the project. Therefore, there would be no impact.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XI.	**NOISE.** Would the project:				
a.	Expose persons to or generate noise levels in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies?	❑	■	❑	❑
b.	Expose persons to or generate excessive groundborne vibration or groundborne noise levels?	❑	❑	❑	■
c.	Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	❑	❑	❑	■
d.	Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	❑	■	❑	❑
e.	Be located within an airport land use plan area, or, where such a plan has not been adopted, within two miles of a public airport or public use airport and expose people residing or working in the project area to excessive noise levels?	❑	❑	❑	■
f.	Be located in the vicinity of a private airstrip and expose people residing or working in the project area to excessive noise levels?	❑	❑	❑	■

Setting

The generation of noise associated with the proposed project would occur from construction activities over the short term. Noise generated in the normal operation of the proposed project would be associated with the operation of the pumps and periodic maintenance vehicles.

Regulatory Environment

City of Stockton

The proposed project site is within the City of Stockton and is therefore subject to the General Plan Noise Element and noise ordinance incorporated therein. In accordance with the General Plan Action Team's *Stockton General Plan 2050, Initial Draft* (August 2004), the goal of the Noise Element is "To protect the community from health hazards and annoyance associated with excessive noise levels."

In accordance with the Element, the City has adopted a "normally acceptable" exterior standard of 60 dBA CNEL for residential and other sensitive land uses such as schools, healthcare facilities, libraries, and churches. These land uses are "conditionally acceptable" with CNEL levels up to 70 dBA. A "normally acceptable" designation means that structures may be of normal construction without any special noise insulation requirements. A "conditionally acceptable" designation requires that a noise analysis be prepared and with requirements for noise insulation features included in the design. Conventional construction, but with closed windows and fresh-air supply systems of air conditioning, normally will suffice.

The Element also sets planning goals for the siting of new land uses that may conflict with existing sensitive uses. The Element notes that the City shall prohibit the development of new commercial, industrial, or other noise-generating land uses adjacent to existing residential uses, and other sensitive receptors such as schools, healthcare facilities, libraries, and churches if noise levels are to exceed 60 dBA CNEL measured at the property line of the noise-sensitive land use. Additionally, the noise associated with commercial and industrial uses is not to exceed 75 and 80 dBA CNEL, respectively, as measured at the nearest property line.

The Element also addresses the potential impacts associated with construction noise. The City recognizes that construction noise is difficult to control and limits hours for these activities to between 7:00 a.m. and 10:00 p.m.

The goals and policies of the Noise Element are administered through the City of Stockton Municipal Code. The Municipal Code does not have set limitations on allowable levels of noise intrusion, but takes a "qualitative" approach. SEC 5-702. Public Nuisance Noise, A. General Noise Regulation notes that

> it shall be unlawful for any person to willfully make or continue to permit or cause to be made or continued, any loud, unnecessary, or unusual noise which unreasonably disturbs the peace and quiet of any neighborhood or which causes discomfort or annoyance to any reasonable person of normal sensitiveness residing in the area.

The standards that are considered in determining whether a violation of the provisions occurs include, but are not limited to:

- the volume of the noise;
- the intensity of the noise;
- whether the nature of the noise is usual or unusual;
- whether the origin of the noise is natural or unnatural;
- the volume and intensity of the background noise, if any;
- the proximity of the noise to residential sleeping facilities;
- the nature and zoning of the area within which the noise emanates;
- the density of the inhabitation of the area within which the noise emanates;
- the time of day the noise occurs;
- the duration of the noise; and
- whether the noise is produced by a commercial or noncommercial activity.

These provisions do not apply to any emergency work.

State of California Standards

The California Office of Noise Control has set acceptable noise limits for various uses. Industrial uses are normally acceptable in exterior noise environments up to 75 dBA CNEL and conditionally acceptable in areas up to 80 dBA CNEL. Again, a conditionally acceptable designation implies that new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements for each land use type is made and needed noise insulation features are incorporated into the design. By comparison, a normally acceptable designation indicates that standard construction can occur with no special noise reduction requirements.

Federal Government

The federal government regulates occupational noise exposure common in the workplace through the Occupational Health and Safety Administration (OSHA) under the USEPA. Noise exposure of this type is dependent on work conditions and is addressed through a facility's health and safety plan.

The U.S. Department of Housing and Urban Development (HUD) has set a goal of 65 dBA L_{dn} as a desirable maximum exterior standard for residential units developed under HUD funding. (This level is also generally accepted within the State of California.) While HUD does not specify acceptable interior noise levels, standard construction of residential dwellings constructed under Title 24

standards typically provides 20 dBA of attenuation with the windows closed. Based on this premise, the interior L_{dn} should not exceed 45 dBA.

Existing Noise Levels

Equipment associated with the proposed oxygenation demonstration project would be located near Berth 20, on Rough and Ready Island. No sensitive land uses are located on the island. The nearest sensitive uses include the off-site residential dwellings located to the northeast across the San Joaquin River channel.

The existing noise levels in the project area result from various stationary and mobile sources. These include ship and boating activities, vehicle travel over public and private roads, railroad activities, ongoing renovation and maintenance activities, and the operation of stationary and mobile noise sources associated with current warehousing activities.

Noise levels both at the project site and in the noted residential area were determined in conjunction with the *West Complex Development Plan* (ESA November 2003). Most relevant to the project at hand, ESA obtained ambient noise levels both at Berth 20 and across the river at Dad's Point. CNEL noise measurements were obtained at Berth 20 between October 10 and October 13, 2002. On-site CNEL values were measured at 84, 81, 62, and 60 dBA, respectively, over the 4-day period. Monitoring equipment and methodology are as described in the ESA document and incorporated here by reference.

No measurements were obtained in the residential tract directly across the channel from Berth 20, and no new measurements were obtained for this current study. However, residential noise levels may be inferred from data obtained by ESA at Dad's Point, also across the river, approximately 1/3 mile to the southeast of the noted homes. ESA conducted noise monitoring at Dad's Point from October 10 through October 14, 2002. CNEL noise measurements were reported at 57, 70, 57, 60, and 57 dBA, respectively, over the 5-day period.

Noise

The generation of noise associated with the proposed project would occur over the short term for site preparation and construction activities. Subsequent to construction, any noise is associated with the operation of the pumps and equipment used in the oxidation demonstration process.

Thresholds of Significance

For stationary sources, the applicable noise standards include criteria established by local as well as any state regulations applicable to the proposed project. The facility is located in an area zoned for industry. The adjoining uses located on

Rough and Ready Island are not considered noise sensitive, and no impact would occur on the existing Berth 20 operations. However, in accordance with the City Noise Element, project-related noise should not exceed 60 dBA CNEL at any sensitive land use property line. This would apply to those homes located along Riviera Drive across the channel.

Mobile-source noise (i.e., on-road vehicle noise) is exempted from local regulation. Here an impact is considered significant if the project were to generate a volume of traffic that would increase this noise level by 3 dBA CNEL (barely noticeable in an exterior environment).

Impact Analysis

The presented impact analysis follows the Mitigated Negative Declaration Checklist format for the preparation of noise impacts as specified under the California Environmental Quality Act (CEQA). The checklist asks if the project would result in the:

a. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Less than Significant with Mitigation Incorporated. An impact could be significant if the project would site a land use in a location where noise levels would exceed the appropriate standards. Additionally, the impact could be significant if on-site construction or operations were to exceed the standards included in the City of Stockton's General Plan and/or Municipal Code. The project includes the construction and operation of an oxidation demonstration program. The existing land use is not deemed as sensitive, but sensitive residential units are located across the channel.

Construction Impacts

Noise generated by on-site construction could subject off-site receptors to elevated noise levels because of the operation of heavy equipment. Construction activities are typically carried out in discrete steps, each of which has its own mix of equipment and, consequently, its own noise characteristics. These various sequential phases would change the character of the noise levels surrounding the construction site as work progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow noise ranges to be categorized by work phase. Table 7 lists typical construction equipment noise levels recommended for noise impact assessment at a distance of 50 feet.

Noise ranges have been found to be similar during all phases of construction, although the actual construction of structures typically results in less noise than do site preparation activities. The grading and site preparation phase tends to create the highest noise levels because the noisiest construction equipment is

found in the earthmoving equipment category. This category includes excavating machinery (backfillers, bulldozers, draglines, front loaders, etc.) and earthmoving and compacting equipment (compactors, scrapers, graders, etc.). Typical operating cycles may involve 1 or 2 minutes of full power operation followed by 3 to 4 minutes at lower power settings. Noise levels at 50 feet from earthmoving equipment range from 73 to 96 dBA, while L_{eq} noise levels range up to about 89 dBA. The construction of structures is somewhat reduced from this value, and the physical presence of the buildings may break up line-of-sight noise propagation.

Table 7. Demolition and Construction Equipment Source Noise Levels

Equipment Type	Typical Equipment at 50 feet (dBA)
Air Compressor	81
Backhoe	85
Concrete Mixer	85
Concrete Pump	82
Concrete Vibrator	76
Crane, Derrick	88
Crane, Mobile	83
Dozer	80
Generator	78
Grader	85
Jack Hammer	88
Loader	79
Paver	89
Pneumatic Tools	85
Pump	76
Roller	74
Power Hand Saw	78
Shovel	82
Truck	91

Source: Bolt, Beranek, and Newman, *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances, U.S. Environmental Protection Agency* 1971.

Composite construction noise is best characterized by Bolt, Beranek, and Newman (USEPA 1971). In their study, construction noise for commercial and industrial development is presented as 89 dBA L_{eq} when measured at a distance of 50 feet from the construction effort. This value takes into account both the number of pieces and spacing of the heavy equipment used in the construction

effort. In later phases during building assembly, noise levels typically are reduced from this value, and the physical structures further break up line-of-sight noise.

The project would not require site grading or large-scale movement of soil material. Most construction would be associated with the augering of the two holes in which the U-Tubes would be placed. This would be performed using a drill rig with a large auger. Spoils could be removed to trucks using a loader. Alternatively, the material could be slurried and pumped to a holding area or to awaiting trucks.

Other construction would include core drilling for the dock structure, setting footings and pouring the concrete foundations, and installing preassembled equipment, including pumps, tanks, and instrumentation. Most of the equipment used in the operation of the demonstration project would be of modular construction requiring only assembly. This could be accomplished with a crane and a forklift. Construction is not expected to exceed approximately 2 weeks in duration.

As noted, the closest sensitive uses include the residential tract located across the channel. The nearest of these home is approximately 650 from the project site. Assuming a worst-case level of 89 dBA L_{eq}, construction noise is estimated at 67 dBA L_{eq} at the nearest residents.

The City recognizes that construction noise is difficult to control and the Noise Element provides exemption for these activities when restricted to between the hours of 7:00 a.m. and 10:00 p.m. Construction that is restricted to these hours would not represent a significant noise impact.

At this time the construction schedule is indeterminate. To avoid collapse of the bore hole or lock-up of the auger, it is possible that the drill rig would need to operate continuously, 24 hours a day, until each of the holes is drilled to completion. Assuming that the 67 dBA L_{eq} level projected at the nearest residents were to occur continuously for a period of 24 hours per day, the CNEL is calculated at 74 dBA. This value then exceeds the 60-dBA threshold for industrial use impacts on adjoining sensitive areas, and the impact is considered as potentially significant.

Mitigation Measures

NO-1 Except where absolutely necessary during drilling (because of potential bore collapse or drill lock-up), construction shall be limited to between the hours of 7:00 a.m. and 10:00 p.m. and shall not take place at any time on Sundays or legal holidays.

NO-2 If boring is required on a 24-hour basis, the contractor shall place a temporary noise screening wall between the drill site and the residents across the channel. This screening wall shall be high enough such that no internal combustion equipment (i.e., heavy equipment engines), or their exhaust stacks, is visible from beyond the wall.

NO-3 If boring is required on a 24-hour basis, the contractor shall inform the residents located along Riviera Drive fronting along the San Joaquin River of the estimated time and length of the disturbance.

NO-4 Regardless of the boring schedule, truck loading and unloading and equipment maintenance shall be performed only between the hours of 7:00 a.m. and 10:00 p.m. and shall not take place at any time on Sundays or legal holidays.

NO-5 During all project construction, the project contractor(s) shall equip all construction equipment, fixed and mobile, with properly operating and maintained noise mufflers and intake silencers, consistent with manufacturers' standards.

NO-6 The construction contractor shall adhere to any and all measures requested by the City of Stockton Planning Departments for noise abatement.

Operational Impacts

Noise from the operation of the oxidation facility would be produced primarily from the pumps used for the extraction of water from the river and circulation through the system. Noise from pumps is based on data obtained in a field study conducted by Synectecology at a Metropolitan Water District (MWD) facility on September 31, 2004. The noise generated by a 150-horsepower stationary water pump noise was measured at 66.1 dBA L_{eq} at a distance of 25 feet (60.1 dBA at 50 feet). The use of two pumps simultaneously would raise this noise level by 3 dBA to approximately 63.1 dBA at 50 feet.

The pumps for the proposed project are projected at just 15 horsepower, and their noise levels could be considerably reduced, accordingly. The nearest sensitive receptors to the proposed facility are the residents located along the east side of the channel. At a distance of 650 feet, the noise from two pumps would be attenuated to no more than 46.8 dBA L_{eq}. Assuming the pumps run 24 hours per day, the CNEL is calculated at 53.6 dBA at the nearest residential property line. This level is well under the 60 dBA CNEL standard included in the Noise Element of the General Plan, and the impact is less than significant.

The actual noise from the pumps would be further reduced as this equipment would be housed in a masonry structure. The structure would afford in excess of 20 dBA of noise attenuation, and pump noise would not be audible at any sensitive locations. Any impact would be less than significant.

b. Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels?

Less-than-Significant Impact. The proposed project would involve on-site construction. The area would be prepared and equipment would be installed using heavy equipment that is typical of the construction industry.

Operational Impacts

It is anticipated that the operation of the facility would entail only regular inspection and maintenance. The number of site-generated truck trips to Rough and Ready Island would not change as a result of the project, and no additional vibration would be generated from project-related vehicles. Any potential impact is less than significant.

c A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Less than Significant. As noted above, assuming the use of two pumps, each operating 24-hours a day, the combined CNEL is calculated at 53.6 dBA at the nearest receptors located across the channel. Based on 5 days of field measurement preformed by ESA, the minimum ambient levels at these homes are estimated at approximately 57 dBA CNEL. The addition of 53.6 dBA CNEL results in a composite noise level of 58.6 dBA. This represents an increase of 1.6 dBA CNEL and is less than the 3-dBA threshold for a significant noise increase. As such, the impact is less than significant.

In actuality, the pumps to be used are considerably smaller than that measured at the MWD facility and used in the noise calculations. Additionally, these pumps are to be placed within a concrete structure, and their noise would be further reduced by in excess of 20 dBA. Finally, annual average ambient levels would be higher than the minimal 57 dBA CNEL used in the analysis, and pump noise would not be audible at any residential receptor locations.

d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Less than Significant. The nearest sensitive receptors are in the residential area across the channel. Noise levels associated with construction activities would be higher than the ambient noise levels in the project area today, but would subside once construction of the proposed project is completed. Two types of noise impacts could occur during the construction phase. First, the transport of workers, equipment, and materials to and from the construction site would incrementally increase noise levels along site-access roadways. However, the number of workers, and their associated vehicles, is too small to add measurably to the existing noise along access routes. Therefore, even though there could be a relatively high single-event noise exposure potential associated with passing trucks, the increase in ambient noise levels would be less than 0.1 dBA when averaged over a 24-hour period, and construction-related impacts associated with vehicle travel would not result in a significant adverse impact.

The second type of short-term noise impact is related to noise generated at the site during augering and construction. Construction would occur over a period of about 2 weeks. During this time, it is possible that the drill rig would need to operate continuously, 24 hours a day. However, at a depth of 200 feet for the boreholes, this could be accomplished over a period of no more than a couple days. Assuming that the 67 dBA L_{eq} level projected for construction activities at the nearest residents were to occur continuously for a period of 24 hours per day,

the CNEL is calculated at 74 dBA. Assuming an ambient level of 57 dBA CNEL, the composite noise is calculated 74 dBA representing a short-term increase of approximately 17 dBA CNEL, and the impact is considered as potentially significant.

Mitigation

Mitigation measures are as specified in a. above and would reduce any potential impact to a less-than-significant level.

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

No Impact. The project site is not located within an airport land use plan area or in the immediate vicinity of any airport. The nearest public use airport to the project site is Stockton Metropolitan Airport, located approximately 7.5 miles to the southeast, and the project is well outside of the airport's 60 dBA CNEL noise contour. Implementation of the proposed project would not expose on-site receptors to excessive aircraft noise levels and no mitigation measures are necessary.

f. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

No Impact. No private airstrips exist within 2 miles of the proposed site. The San Joaquin General Hospital's heliport represents the nearest private use facility. At more than 6 miles from the hospital, the proposed project would not result in a noise hazard for to any proposed site use. No mitigation measures are necessary.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XII.	**POPULATION AND HOUSING.** Would the project:				
a.	Induce substantial population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?	❑	❑	❑	■
b.	Displace a substantial number of existing housing units, necessitating the construction of replacement housing elsewhere?	❑	❑	❑	■
c.	Displace a substantial number of people, necessitating the construction of replacement housing elsewhere?	❑	❑	❑	■

Setting

The proposed project is an aeration demonstration project that would be located on Dock 20 in the Port of Stockton West Complex and would be designed to:

- transfer 10,000 lbs O_2/day to the DWSC,
- evaluate water quality benefits associated with the delivery of 10,000 lbs O_2/day,
- collect key design parameters to better understand their relationship to U-Tube transfer efficiency, and
- gather additional information on impacts that may occur as an unintended consequence of large-scale aeration.

Impact Discussion

a, b, c. Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly; displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere; displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

No Impact. The proposed project would have no effect on the increase in area population, the construction or removal of housing units, or the displacement of existing housing environments. Therefore, there would be no impact.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XIII.	**PUBLIC SERVICES.** Would the project:				
a.	Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or a need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:				
	Fire protection?	❑	❑	❑	■
	Police protection?	❑	❑	❑	■
	Schools?	❑	❑	❑	■
	Parks?	❑	❑	❑	■
	Other public facilities?	❑	❑	❑	■

Setting

The proposed project would be located on Dock 20 in the Port of Stockton West Complex in an area zoned for Port Industrial uses and characterized by large ship-unloading facilities, material transportation equipment, and parking areas. In addition, the proposed project is an aeration demonstration project that would be designed to:

- transfer 10,000 lbs O_2/day to the DWSC,
- evaluate water quality benefits associated with the delivery of 10,000 lbs O_2/day,
- collect key design parameters to better understand their relationship to U-Tube transfer efficiency, and
- gather additional information on impacts that may occur as an unintended consequence of large-scale aeration.

Impact Discussion

a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or

physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services: Fire Protection; Police Protection; Schools; Parks; Other Public Facilities.

No Impact. The proposed project contains no design element that would interfere or influence any of the above-noted public services.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XIV.	**RECREATION.** Would the project:				
a.	Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	❑	❑	❑	■
b.	Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	❑	❑	❑	■
c.	Does the project include potential safety impacts on recreational users?	❑	❑	❑	■

Setting

The proposed project would be located on Dock 20 in the Port of Stockton West Complex in an area zoned for Port Industrial uses and characterized by large ship-unloading facilities, material transportation equipment, and parking areas. In addition, the proposed project is an aeration demonstration project that would be designed to:

- transfer 10,000 lbs O_2/day to the DWSC,
- evaluate water quality benefits associated with the delivery of 10,000 lbs O_2/day,
- collect key design parameters to better understand their relationship to U-Tube transfer efficiency, and
- gather additional information on impacts that may occur as an unintended consequence of large-scale aeration.

Impact Discussion

a, b. Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated

No Impact. The proposed project contains no design element nor would it be located in an area that would affect any parks or recreational facilities.

c. Include potential safety impacts on recreational users.

No Impact. The proposed project is located in an industrial area of the DWSC that is not used for recreational shipping purposes. In addition, the project contains no design element that would create a hazard to recreational users.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XV.	**TRANSPORTATION/TRAFFIC.** Would the project:				
a.	Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections)?	❑	❑	■	❑
b.	Cause, either individually or cumulatively, exceedance of a level-of-service standard established by the county congestion management agency for designated roads or highways?	❑	❑	❑	■
c.	Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	❑	❑	❑	■
d.	Substantially increase hazards because of a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	❑	❑	❑	■
e.	Result in inadequate emergency access?	❑	❑	❑	■
f.	Result in inadequate parking capacity?	❑	❑	❑	■
g.	Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	❑	❑	❑	■

Setting

The proposed project would be located on Dock 20 in the Port of Stockton West Complex in an area zoned for Port Industrial uses and characterized by large ship-unloading facilities, material transportation equipment, and parking areas.

Impact Discussion

a–g Increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase

in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections); exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways; result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks; substantially increase hazards because of a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment); result in inadequate emergency access; result in inadequate parking capacity; conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).

Less than Significant. The proposed project is located in a Port Industrial area on a pier and contains no design element that would affect shipping traffic, vehicular traffic (including parking), or air traffic in any way. In addition, the proposed project's design and infrastructure do not encumber emergency access to Dock 20. Further, the project would not use or occupy parking space from the existing adjacent parking areas. There would be traffic increases relative to construction activities in a limited construction window of activity, from equipment and workers, and occasional trips for LOX recharge of the tank and maintenance during the operation of the project, but these increases would be minimal. The project would have less than significant impact on transportation, traffic, or circulation.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XVI.	**UTILITIES AND SERVICE SYSTEMS.** Would the project:				
a.	Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	❑	❑	❑	■
b.	Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	❑	❑	❑	■
c.	Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	❑	❑	❑	■
d.	Have sufficient water supplies available to serve the project from existing entitlements and resources, or would new or expanded entitlements be needed?	❑	❑	❑	■
e.	Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	❑	❑	❑	■
f.	Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	❑	❑	■	❑
g.	Comply with federal, state, and local statutes and regulations related to solid waste?	❑	❑	■	❑

Setting

The proposed project would be located on Dock 20 in the Port of Stockton West Complex in an area zoned for Port Industrial uses and characterized by large ship-unloading facilities, material transportation equipment, and parking areas. In addition, the proposed project is an aeration demonstration project that would be designed to:

- transfer 10,000 lbs O_2/day to the DWSC,

- evaluate water quality benefits associated with the delivery of 10,000 lbs O_2/day,
- collect key design parameters to better understand their relationship to U-Tube transfer efficiency, and
- gather additional information on impacts that may occur as an unintended consequence of large-scale aeration.

Impact Discussion

a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

b. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

c. Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

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

No Impact. The proposed aeration demonstration project has no design element that will: create wastewater; create a demand for wastewater treatment facilities or potable water facilities; require the construction of stormwater drainage facilities or the expansion of existing facilities; use a significant amount of potable water.

f, g. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs; comply with federal, state, and local statutes and regulations related to solid waste?

Less than Significant. The proposed project would generate relatively little waste. In addition, construction and operation of the project would comply with the California Integrated Waste Management Act (AB 939) by implementing specific source reduction measures that require mandatory pre-processing of all solid waste generated within the project area.

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

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Personal Communications

Jeff Wingfield. Environmental Specialist Port of Stockton, Stockton, CA. December 8, 2004, via e-mail 916-752-0980