DRAFT

Environmental Impact Report for the

Vallejo Marine Terminal and Orcem Project

State Clearinghouse # 2014052057

SEPTEMBER 2015

PREPARED FOR:

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VALLEJO MARINE TERMINAL AND ORCEM PROJECT ENVIRONMENTAL IMPACT REPORT

Prepared for:

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ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
°F	degrees Fahrenheit
AB	Assembly Bill
AFY	acre-feet per year
BAAQMD	Bay Area Air Quality Management District
BACT	Best Available Control Technology
BCDC	Bay Conservation and Development Commission
BMPs	best management practices
CAA	Clean Air Act (federal)
CAAQS	California Ambient Air Quality Standards
CalOSHA	California Occupational Safety and Health Administration
CalRecycle	California Department of Resources Recycling and Recovery
Caltrans	California Department of Transportation
CA-MUTCD	California Manual of Uniform Traffic Control Devices
CAP	Clean Air Plan
CARB	California Air Resources Board
CARE	Community Air Risk Evaluation
CBC	California Building Code
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code Federal Regulations
CGS	California Geological Survey
CH_4	methane
City	City of Vallejo
CMP	Congestion Management Plan
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNG	compressed natural gas
CO_2	carbon dioxide
CO_2E	carbon dioxide equivalent
CO-CAT	Coastal and Ocean Working Group of the California Climate Action Team
CPUC	California Public Utilities Commission
CREATE	Chicago Rail Efficiency and Transportation Efficiency
CRHR	California Register of Historical Resources
CWA	Clean Water Act
CWR	Continuous Welded Rail
cyd	cubic yards
CZMA	Coastal Zone Management Act
dB	decibel
DPM	diesel particulate matter

Acronym/Abbreviation	Definition
DPS	distinct population segment
dscf	dry standard cubic foot
EIR	Environmental Impact Report
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FMP	fishery management plan
FOS	factor of safety
FTA	Federal Transit Administration
GBFS	granulated blast furnace slag
GGBFS	ground granulated blast furnace slag
GHG	greenhouse gas
GIP	General Industrial Permit
GVRD	Greater Vallejo Recreation District
GWP	global warming potential
HAG	hot air generator
HARP	Hotspots Analysis Reporting Program
HCM	Highway Capacity Manual
HFC	hydroflourocarbon
HI	Hazard Index
Hz	hertz
I-780	Interstate Highway 780
I-80	Interstate Highway 80
IEP	Interagency Ecological Program
kHz	kilohertz
LAFCO	Solano County Local Agency Formation Commission
lbs/year	pounds per year
L_{dn}	day-night sound level
L_{eq}	equivalent sound level
L_{max}	maximum sound level
L_{min}	minimum sound level
LID	Low Impact Development
LOS	level of service
LTMS	Long-Term Management Strategy
MBTA	Migratory Bird Treaty Act
mgd	million gallons per day
MLLW	mean lower low water
MMPA	Marine Mammal Protection Act
MMT	million metric tons
mph	miles per hour
MRP	Municipal Regional Permit

Acronym/Abbreviation	Definition
MMscf	million standard cubic feet
MT	metric tons
MTSA	Maritime Transportation Security Act
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NEPA	National Environmental Policy Act
nm	nautical mile
NOAA	National Oceanic and Atmospheric Administration
NOAA Fisheries	National Oceanic and Atmospheric Administration Marine Fisheries Service
NOP	Notice of Preparation
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NSL	noise-sensitive location
O_3	ozone
Orcem	Orcem California Inc.
OSHA	Occupational Safety and Health Administration
PAH	polycyclic aromatic hydrocarbons
PCE	passenger car equivalents
PFC	perfluorocarbon
PGA	peak ground acceleration
PG&E	Pacific Gas and Electric
ppt	parts per trillion
PPV	perturbation projection vector
PSD	Prevention of Significant Deterioration
PSHA	probabilistic seismic hazard assessment
QSD/QSP	Qualified SWPPP Developer/Qualified SWPPP Practitioner
RCNM	Roadway Construction Noise Model
RCRA	Resource Conservation and Recovery Act
REL	reference exposure level
ROG	reactive organic gas
RPS	Renewable Portfolio Standard
RWQCB	Regional Water Quality Control Board
SAFE Port Act	Security and Accountability for Every Port Act
SAV	submerged aquatic vegetation
SB	Senate Bill
SF_6	sulfur hexafluoride
SFBAAB	San Francisco Bay Area Air Basin
SHPO	State Historic Preservation Office
SLR	sea level rise
SR	State Route
SRI	solar reflectance index
SSMP	Sanitary Sewer Management Plan

Acronym/Abbreviation	Definition
STA	Solano Transportation Authority
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TACs	Toxic Air Contaminants
TMDLs	total maximum daily loads
TOG	total organic gas
tpy	tons per year
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
UWMP	Urban Water Management Plan
v/c	volume-to-capacity
VFD	Vallejo Fire Department
VMT	Vallejo Marine Terminal LLC
VPD	Vallejo Police Department
VRM	vertical roller mill
VCUSD	Vallejo City Unified School District
VRM	vertical roller mill
VSFCD	Vallejo Sanitation and Flood Control District
WDRs	Waste Discharge Requirements
WTP	water treatment plant
WWTP	Wastewater Treatment Plant

EXECUTIVE SUMMARY

ES.1 INTRODUCTION

The City of Vallejo (City) has prepared this Environmental Impact Report (EIR) to provide the public and responsible agencies information about the potential adverse effects on the local and regional environment associated with the proposed Vallejo Marine Terminal (VMT) and Orcem Project, collectively referred to as the proposed project. This Draft EIR has been prepared pursuant to the California Environmental Quality Act (CEQA) of 1970 (as amended), codified at California Public Resources Code Section 21000 et seq., and the CEQA Guidelines in the California Code of Regulations, Title 14, Section 15000 et seq.

This Draft EIR is being circulated for public review and comment for a period of 45 days. During this period, the general public, organizations, and public agencies can submit comments to the lead agency on the Draft EIR's accuracy and completeness. Release of this Draft EIR marks the beginning of a 45-day public review period pursuant to CEQA Guidelines Section 15105. The public review period for the Draft EIR will be from September 3, 2015, to October 19, 2015. The public can review the Draft EIR at the following address during normal business hours or on the City's website at http://www.ci.vallejo.ca.us/.

City of Vallejo
555 Santa Clara Street
Vallejo, California 94590

The City encourages all commenters on the Draft EIR to submit their comments in writing. All comments or questions regarding the Draft EIR should be addressed to:

Andrea Ouse, Community and Economic Development Director
City of Vallejo
555 Santa Clara Street
Vallejo, California 94590
707.648.4163
andrea.ouse@cityofvallejo.net

Following the public review period, the City will prepare a Final EIR, which will include responses to all written comments received during the Draft EIR public review period. The City may use this Draft EIR to approve the proposed project, make findings regarding identified impacts, and if necessary, adopt a Statement of Overriding Considerations regarding these impacts.

ES.2 PROJECT LOCATION

The site of the proposed project occupies a total of 39.1-acres located at 790 and 800 Derr Avenue in the southwestern portion of the City of Vallejo, California, fronting the Mare Island Strait (see Figures 1-1 and 1-2). This combined project site is regionally accessible to vehicular traffic from Interstate Highways 80 (I-80) and 780 (I-780) via State Highway 29 (SR-29 or Sonoma Boulevard), Curtola Parkway and Lemon Street, to Derr Avenue. It is also accessible for rail transportation via the California Northern Railroad rail line network that extends along the Vallejo waterfront, as well as for shipping transportation via the adjoining proposed deep-water terminal included as part of the VMT component of the project.

ES.3 EXISTING PROJECT SITE

The project site contains the former General Mills deep-water terminal and buildings associated with the former General Mills plant. The General Mills plant closed in 2004, and the project site has since remained vacant.

VMT owns a majority of the project site and has a long-term lease with the City of Vallejo (City) for the remainder of the site (APN 0061-160-230). Orcem would lease a 4.83-acre portion of the site for its proposed operations, while VMT would operate on the remaining 34.3 acres. VMT could potentially lease additional portions of the site to other operations in the future, which may require subsequent environmental review. The project site is currently secured by a fence which extends around nearly the entire land portion of the VMT Site.

ES.4 PROJECT OVERVIEW

The VMT project component would reestablish industrial uses on a portion of the 34.3 acres designated as the VMT Site located at 790 and 800 Derr Avenue. The VMT component would involve the removal of a deteriorated timber wharf and construction of a modern deep-water terminal, including wharf improvements, laydown area, and trucking and rail connections, primarily servicing the import and export of bulk and break-bulk commodities within approximately 10.5 acres referred to as the VMT Terminal Site. Construction of the terminal would require fill and dredging activities in the water. The VMT component would be constructed in two phases over a period of time. Some construction elements, such as demolition of the former General Mills Warehouse Building and connected Bakery Bulkhouse, and construction of rail improvements are tied to market demand and may therefore take place following completion of the initial Phase 1 VMT improvements. These elements would be completed prior to completion of the VMT Phase 2 rock dike. In addition to the construction and operation of this modern terminal, the VMT component would also reuse several of the existing buildings formerly occupied by General Mills. Buildings and structures to remain would be used by VMT for administrative office and commercial office uses consistent with the City's Intensive Use zoning district standards.

As an operational deep draft facility (allowing vessels with a vertical distance between the waterline and the bottom of the ship of approximately 38 feet), the VMT Terminal is anticipated to handle a wide range of commodities including the following:

- Feed grains
- Manufactured steel
- Timber/lumber
- Rock, aggregate, ores, and related materials (including granulated blast furnace slag (GBFS), portland cement clinker material (clinker), and related materials)
- Project-based break-bulk items (e.g., heavy lift transport, large construction assemblies)
- Marine construction materials
- Gypsum

Remaining portions of the severely damaged and decayed wharf structure would be carefully removed as part of the VMT component of the project because the structure is not physically suitable or economically feasible for reuse or repair. The remnants of the old wooden wharf which have undergone repair, replacement, and partial removal over the years have experienced substantial decay over the past century and in the last decade in particular. The new deep-water terminal would be constructed at this location. The wharf would include a pile-supported structural concrete deck, associated mooring and fender systems for docking vessels, and related improvements for deep-water marine transportation operations.

The Orcem component of the project would involve construction and operation of an industrial facility for the production of a high performance, less polluting alternative for the traditional portland cement material used in most California construction projects. The production of ground granular blast furnace slag (GGBFS) is considered to be less polluting than the production of portland cement because it is produced using a by-product of steel manufacturing. The Orcem component would involve construction of approximately 73,000 square feet of buildings, equipment, and enclosures, together with outdoor storage areas, on a 4.83-acre portion of the former General Mills plant site leased from VMT. Eight of the buildings and equipment previously used by General Mills within the Orcem Site would be demolished in order to accommodate construction and operation of the proposed GGBFS and related cement products production facility. The Orcem component would be constructed in phases to coincide with the growth in demand for Orcem's products. Orcem would import most of the raw materials used in the proposed plant via the proposed Phase 1 wharf on the adjoining VMT Site. As discussed in

Section 2.2, the Orcem component of the project would operate as a General Industrial Use because it does not involve use of radioactive materials, petroleum refining, or the manufacture of explosives, and would not result in high levels of sewage discharge.

ES.5 PROJECT OBJECTIVES

The project objectives are as follows:

- Establishment of the VMT Terminal as a key site of multi-modal and intermodal transportation and logistics, thereby enhancing Vallejo's role in the regional and international trade economy and providing a means for locally manufactured products to be transported and distributed, increasing the viability of and the potential for attracting further manufacturing operations to Vallejo.
- Maximize the potential for the manufacture of GGBFS, a product that helps to meet the needs of the construction industry for high-performance, environmentally favorable concrete and sustainable building materials, by providing for an efficient scale of production at a plant that would operate around the clock as a multi-modal receiving, storage, processing, and distribution facility.
- To provide management and skilled labor employment opportunities for local and regional residents in the construction phases, as well as the long-term operations of commercial and industrial uses on the project site.
- To generate various tax revenues including property taxes and assessments, possessory interest tax, and utility user fees.
- To reestablish and optimize the industrial use of this centrally located marine industrial property through removal of those remaining components of the severely damaged timber wharf and construction of a modern deep-water terminal.
- To maximize accommodations for shipping and receiving of a wide range of products through the VMT Terminal, including loading and unloading of vessels of up to 70,000 metric tons in size with draft of up to 38 feet through the Phase 1 Wharf, along with a combination of barge and other smaller vessels through the Phase 2 rock dike. The improvements would help to further develop Vallejo's capabilities for water-based shipping in connection with the Port of Oakland.
- To maximize throughput capacity through the implementation of intermodal upgrades designed to optimize cargo handling operations as well as modern design initiatives enabling the most efficient use of the ground area and taking advantage of existing truck, rail, and shipping access for import and export of raw materials and finished products.

- To establish the VMT Terminal as a key site of multi-modal and intermodal transportation and logistics, thereby enhancing Vallejo's role in the regional and international trade economy.
- To provide a means for locally manufactured products to be transported and distributed, increasing the viability of and the potential for attracting further manufacturing operations to Vallejo (in addition to Orcem).
- To establish an around-the-clock multi-modal receiving, storage, processing, and distribution facility focused on the manufacture of ground granulated blast furnace slag (GGBFS), a product that helps to meet the needs of the construction industry for high-performance, environmentally preferable concrete and sustainable building materials.
- To reliably provide competitively priced and environmentally preferable cement products and offer blended GGBFS cements and non-GGBFS cementing products, in order to provide a complete line of competitive products that meet long-term client and project needs, and to have the ability to respond to potential worldwide shortages of GGBFS supplies, thereby assuring sustainability of Orcem's operation over time.
- To follow the federal Short Sea Shipping Highway Initiative where possible by focusing on short sea shipping opportunities that move cargo by coastal and inland waterway barges, reducing both truck and rail environmental impacts.

ES.6 SUMMARY OF IMPACTS

Table ES-1 presents a summary of the potentially significant environmental impacts that could result from the project, the proposed mitigation measures, and the level of significance of the impact after the implementation of the mitigation measures.

Table ES-1
Summary of Potentially Significant Environmental Impacts

Impact	Mitigation Measures	Level of Significance After Mitigation
	Aesthetics	
Impact 3.1.1: The proposed project would involve 24-hour operations that would require extensive lighting for safety and security. These	**MM-3.1-1:** Final lighting plans for the VMT and Orcem projects shall be submitted to and reviewed by the City of Vallejo during the Site Development Review process and shall be approved by the City prior to issuance of a building permit. The City shall verify that the final lighting plans include provisions to ensure that outdoor lighting is designed so that potential glare or light spillover to surrounding properties is minimized through appropriate site design and shielding of light standards, consistent with the preliminary plans. The plans shall also demonstrate that the use of reflective exterior materials is minimized and that proposed reflective material would not create additional daytime or nighttime glare. Measures identified in the final lighting plans shall be incorporated into construction plans	Less than significant

Table ES-1
Summary of Potentially Significant Environmental Impacts

Impact	Mitigation Measures	Level of Significance After Mitigation
new sources of light and glare could adversely affect views in the project area, and the impact would be **significant.**	and implemented by the construction contractor.	
	Air Quality	
Impact 3.2-1: The proposed rezoning of the 5.25-acre portion of the project site has the potential to introduce a more intensive land use to the property, and this potential change was not taken into account in the most recent state ozone plan—the Bay Area 2010 Clean Air Plan, adopted by the Board of Directors in September 2010**.** This impact would be **significant**.	No feasible mitigation.	Significant and unavoidable
Impact 3.2-2: Operation of the proposed project result in an exceedance of the Bay Area Air Quality Management District (BAAQMD) NO_x threshold, which would conflict with the Clean	**MM-3.2-1:** After the calendar year at which 15 vessels arrive at the site, the project operators for the VMT facility and Orcem Plant shall retain a qualified air quality specialist to calculate and report annual emissions from trucks and on-site equipment to confirm that emissions are below 10 tons per year. This report shall be submitted to the City of Vallejo for review. At the time emissions exceed 10 tons per year, the project operators shall ensure that at least 75% of the trucks entering the site are model year 2010 or later. This measure shall be enforced until year 2023, when the Drayage Truck Regulation adopted by the California Air Resources Board will require 100% of trucks to be model year 2010 or newer.	Significant and unavoidable

Table ES-1
Summary of Potentially Significant Environmental Impacts

<table>
<tr><th>Impact</th><th>Mitigation Measures</th><th>Level of Significance After Mitigation</th></tr>
<tr><td>Air Plan’s goal of bringing the air basin into attainment for ozone since NO_x is a precursor to the development of ozone. Impacts would be significant.</td><td></td><td></td></tr>
<tr><td>Impact 3.2-3: The proposed project would not include the applicable control measures from the Clean Air Plan.</td><td>See MM-3.2-1 above.

MM-3.2-2: Mitigated cancer risk for various scenarios are presented in Table 3.2-19, along with the maximum average vessel calls per year allowable under each scenario before additional mitigation is required. Mitigation measures in Table 3.2-19 are intended to allow a choice of technologies based on the most cost-effective measures available at the time of implementation.

Table 3.2-19
MM-3.2-2
<table>
<tr><th>Measures</th><th>Maximum Residential Cancer Risk at Full Capacity of 48 Ships (in one million)</th><th>Maximum number of ship calls for a Less-Than-Significant Impact</th><th>Mitigated Residential Cancer Risk at Maximum Ship Calls (in one million)</th></tr>
<tr><td>At least 20% biodiesel in all on-site equipment (base case)</td><td>13.34</td><td>28</td><td>9.92</td></tr>
<tr><td>100% biodiesel in conveyors and hoppers; at least 20% biodiesel in all other on-site equipment</td><td>11.96</td><td>36</td><td>9.91</td></tr>
<tr><td>At least 20% biodiesel in all equipment, with Orcem compressed natural gas front-end loaders</td><td>10.17</td><td>47</td><td>9.995</td></tr>
</table>
</td><td>Less than significant</td></tr>
</table>

Table ES-1
Summary of Potentially Significant Environmental Impacts

<table>
<tr><th>Impact</th><th>Mitigation Measures</th><th>Level of Significance After Mitigation</th></tr>
<tr><td></td><td>

Table 3.2-19
MM-3.2-2

<table>
<tr><th>Measures</th><th>Maximum Residential Cancer Risk at Full Capacity of 48 Ships (in one million)</th><th>Maximum number of ship calls for a Less-Than-Significant Impact</th><th>Mitigated Residential Cancer Risk at Maximum Ship Calls (in one million)</th></tr>
<tr><td>At least 20% biodiesel in all equipment, with Orcem and VMT compressed natural gas front-end loaders</td><td>9.39</td><td>48 (full capacity)</td><td>9.39</td></tr>
<tr><td>100% biodiesel in conveyors and hoppers, at least 20% biodiesel in forklift and VMT front-end loaders, Orcem compressed natural gas front end loaders</td><td>9.74</td><td>48 (full capacity)</td><td>9.74</td></tr>
</table>

Source: Appendix D-1.

Note: Due to the relative contributions from different sources (on-site equipment, ship hoteling, trucks, etc.), the location of the maximally exposed individual may vary with the number of ship calls and mitigation measures. The values presented here represent the maximum residential risk for each scenario.

Emissions associated with mitigated equipment scale with the number of vessel calls, depending on whether Orcem or VMT operate the equipment. For example, in the mitigation scenarios evaluated in Table 3.2-19, only the number of VMT vessel calls is adjusted, thus only diesel emissions from VMT equipment are affected.

In addition to MM-3.2-1 and MM-3.2-2, the following project design features would be implemented to ensure fugitive dust measures are implemented during project operation:

PDF-AQ-1: *Process plant and material storage buildings*—All air in contact with raw material or finished product, such as air from storage buildings, silos, and elevators, is treated by bag filters or other types of filter prior to discharge to the atmosphere, with a not to exceed limit value of 2.5 mg/Nm^3 (0.0011 grains/dry standard cubic foot (dscf)) PM$_{2.5}$.

PDF-AQ-2: *Truck filling with finished product*—Filling of the Orcem component finished products takes place in an enclosed area using tanker trucks, isolated

</td><td></td></tr>
</table>

Table ES-1
Summary of Potentially Significant Environmental Impacts

<table>
<tr><th>Impact</th><th>Mitigation Measures</th><th>Level of Significance After Mitigation</th></tr>
<tr><td></td><td>
<p>from the external environment with air discharged through bag filter to atmosphere, with a not to exceed limit of 2.5 mg/Nm^3 (0.0011 grains/dscf) $PM_{2.5}$.</p>
<p>PDF-AQ-3: <i>Railcar filling</i>—Filling of Orcem rail tanker cars takes place in an enclosed area, isolated from the external environment with air discharged through bag filter to atmosphere, with a not to exceed limit of 2.5mg/Nm^3 (0.0011 grains/dscf) $PM_{2.5}$.</p>
<p>PDF-AQ-4: In addition to BAAQMD best management practices related to fugitive dust control, the following measures are required to be implemented to further reduce potential impacts related to fugitive dust during project operations:</p>
<table>
<tr><th>Potential Source of Air Emissions</th><th>PDF-AQ-4: Operational Measures to Ensure Impacts are Minimized</th></tr>
<tr><td>Grab crane on ship transfers GBFS to mobile hopper</td><td>Watering of material transfer point to ensure adequate moisture content giving a control effectiveness of 95% (SCAMQD 2007).</td></tr>
<tr><td>Hopper drop to conveyor</td><td>Watering of material transfer point to ensure adequate moisture content and aspirated hopper discharging through filter giving a control effectiveness of 95% (SCAMQD 2007).</td></tr>
<tr><td>Conveyor drop to conveyor</td><td>Watering of material transfer point to ensure adequate moisture content giving a control effectiveness of 95% (SCAMQD 2007).</td></tr>
<tr><td>Conveyor drop to mound in GBFS storage area</td><td>Watering of material transfer point to ensure adequate moisture content giving a control effectiveness of 95% (SCAMQD 2007).</td></tr>
<tr><td>Front loader excavation of stockpile</td><td>Watering of material transfer point to ensure adequate moisture content giving a control effectiveness of 95% (SCAMQD 2007).</td></tr>
<tr><td>Loading of hopper by front loader</td><td>Watering of material transfer point to ensure adequate moisture content and aspirated hopper discharging through filter giving a control effectiveness of 95% (SCAMQD 2007).</td></tr>
<tr><td>Raw material storage piles</td><td>Frequent watering of storage pile and three-sided enclosure for two of the three stockpiling areas giving a control effectiveness of 90% – 97.5% (SCAMQD 2007, EPA AP-42).</td></tr>
<tr><td>Industrial Paved Road (finished product)</td><td>Watering three times daily giving a control effectiveness of 80% (SCAMQD 2007).</td></tr>
</table>
<p>Source: Appendix D-1</p>
</td><td></td></tr>
<tr><td>Impact 3.2-4: The proposed project would</td><td>See MM-3.2-1.</td><td>Significant and unavoidable</td></tr>
</table>

Table ES-1
Summary of Potentially Significant Environmental Impacts

Impact	Mitigation Measures	Level of Significance After Mitigation
exceed the BAAQMD threshold for NO_x emissions. Cumulative impacts due to NO_x emissions during operations would therefore be **significant**.		
Impact 3.2-5: The proposed rezoning of the 5.25-acre portion of the project site has the potential to introduce a more intensive land use to the property, and this potential change was not taken into account in the most recent state ozone plan—the Bay Area 2010 Clean Air Plan, adopted by the Board of Directors in September 2010. This cumulative impact would be **significant**.	No feasible mitigation. Refer to Section 3.2 for discussion.	Significant and unavoidable
Impact 3.2-6: The combined project operations would exceed the BAAQMD threshold for cancer risk. Impacts would be **significant.**	See MM 3.2-2.	Less than significant.

Table ES-1
Summary of Potentially Significant Environmental Impacts

Impact	Mitigation Measures	Level of Significance After Mitigation
	Biological Resources	
Impact 3.3-1: Construction of both the VMT and Orcem project components could disturb breeding and nesting behaviors of special-status species of birds as well as common raptor and passerine species protected by the Migratory Bird Treaty Act. If project implementation disturbs an active nest, it would constitute a **significant impact.**	**MM-3.3-1:** Should construction activities begin during the nesting season (February 15 through August 31), a qualified biologist shall conduct appropriate pre-construction surveys for any raptor or other nesting migratory bird nests within or immediately adjacent to the project site no more than 30 days before any construction activity commences. The pre-construction surveys shall be conducted between February and August and shall follow accepted survey protocols for nesting birds. The purpose of the surveys shall be to determine if active nests of special-status birds or migratory birds are present in the disturbance zone or within 500 feet of the disturbance zone boundary. If active nests are found, the biologist shall consult with the California Department of Fish and Wildlife to determine the appropriate buffer depending upon the species. Limits of construction to avoid impacts to an active nest during construction activities shall be established in the field with flagging, fencing, or other appropriate barriers, and construction personnel shall be instructed on the sensitivity of nest areas. If ground-disturbing activities are delayed, then additional pre-disturbance surveys shall be conducted such that no more than 7 days elapse between the survey and ground-disturbing activities. The qualified biologist shall serve as a construction monitor during those periods when construction activities are to occur near active nest areas to avoid inadvertent impacts to these nests.	Less than significant
Impact 3.3-2: While it is unlikely that the Townsend's big-eared bat or roost sites would be found on the project site, disturbance of roost sites would be a **significant impact**.	**MM-3.3-2**: No earlier than 30 days prior to initiation of construction activities, or such other period as may be approved in writing by the California Department of Fish and Wildlife (CDFW), a pre-construction survey shall be conducted by a qualified biologist (i.e., a biologist holding a CDFW collection permit and a Memorandum of Understanding with CDFW allowing the biologist to handle bats) to determine if active roosts of Townsend's big-eared bat are present on or within 300 feet of the construction area. Surveys shall include the structure(s) planned for removal. If Townsend's big-eared bat is detected roosting in any of the sites planned for removal, the project applicant shall consult with the CDFW to determine the appropriate course of action prior to initiation of any construction activities within 300 feet of the occupied roost. Under no circumstance shall an active roost be directly disturbed, and construction within 300 feet shall be postponed or halted, until the roost is naturally vacated, as determined by a qualified biologist. If bats do not vacate the roost voluntarily, and the roost site must be removed, the project applicant shall consult with CDFW to develop an eviction plan and secure any necessary permit for incidental take of the bat.	Less than significant
Impact 3.3-3: Removal of the estimated 444 creosote pilings	**MM-3.3-3**: Creosote Piling Removal Plan: Prior to removal of any pilings from the VMT Site or the City of Vallejo Municipal Marina, VMT shall develop a Piling Removal Plan that begins with an inventory of all existing pilings at the wharf, documents their individual condition, and suitability for removal using Best Management Practices (BMPs). The Plan	Less than significant

Table ES-1
Summary of Potentially Significant Environmental Impacts

Impact	Mitigation Measures	Level of Significance After Mitigation
at the VMT Site could result in the release of toxic polycyclic aromatic hydrocarbons (PAHs) from creosote piling fragments if the pilings are not removed properly, which would result in a **significant impact.**	shall address, but not be limited to the following: • Use of vibratory hammers (timbers jaws) as the primary method of removal for all wood pilings whose wood cores have not rotted away, making use of a vibratory hammer impracticable. If use of a vibratory hammer is not practicable for more than 20% of the pilings, the applicant shall provide verifiable documentation for which piles cannot be removed using a vibratory hammer. A demonstration effort may be required to validate the applicant's justification for not being able to use vibratory removal equipment. • Use of direct pull with a cable or chain and crane to remove pilings. • Other feasible methods that remove the pilings in their entirety or with as little shredding of the pilings as possible. • Use of excavators to remove deteriorated creosote wood pilings shall only be used where it would be ineffective to use vibratory hammers or other cited methods. • Use of a floating boom, designed for deployment in high energy environments. The floating boom shall be used during all piling removal as well as dredging activities if excavators are needed to remove the wood pilings, leaving sections of the pilings in the Bay sediments which would be removed during dredging. • Proper use and deployment of boom anchors to ensure that the boom remains open and recovers all floating debris, especially during removal of the outer rows of pilings. • Regular removal of all collected debris within the boom on a regular schedule (minimum hourly). The boom shall be cleaned of all debris at the end of the day prior to shut down. • Use of a skiff or chase boat to recover any floating debris that falls outside or escapes the containment boom. • Proper onshore retention and disposal of creosote wood pilings and debris and the proper disposal of all pilings and debris. This plan shall conform to all U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), Bay Conservation and Development Commission (BCDC), and City of Vallejo permit conditions and be reviewed and approved by the City of Vallejo and a third-party independent environmental mitigation monitor.	
Impact 3.3-4: During proposed deconstruction and construction activities at the VMT Site (during both Phase 1 wharf and Phase 2 dike construction) construction debris could be	**MM-3.3-4:** Construction/Deconstruction Pollution Prevention Plan: Prior to any deconstruction of the existing wharf, removal of any pilings, removal or burial of existing shoreline armoring/riprap, and construction of the new wharf and dike, VMT shall prepare and implement a Construction/Deconstruction Pollution Prevention Plan. This plan shall detail all steps to be taken, including selection of equipment, operational procedures, on-site monitors, etc. that will be employed to ensure that no construction or deconstruction debris is accidentally deposited or remains in Napa River or Bay–Delta waters and therein pose a threat to special-status fish species, marine mammals, and any Bay–Delta ecosystems. This plan shall conform to all USACE, RWQCB, BCDC, and City of Vallejo permit conditions and be reviewed and approved by the City of Vallejo and a third-party independent environmental mitigation monitor. The plan shall include but not be limited to: • Training of all personnel engaged in construction/deconstruction activities as to the	Less than significant

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Impact	Mitigation Measures	Level of Significance After Mitigation
introduced, including contaminant containing concrete, brick and asphalt materials, creosote wood, hydrocarbons, building materials and wrapping, and sediment runoff into the Napa River and the greater Bay–Delta ecosystem. The deliberate or accidental discharge of construction and deconstruction materials into project site waters could result in a **significant impact.**	importance of preventing any materials, especially hydrocarbon containing materials from entering the water. • Measures to be implemented to prevent foreign materials (e.g., wood scraps, wood preservatives, fuels, lubricating oils, hydraulic fluids, other chemicals, etc.) from entering the Napa River or other Bay–Delta waters. This requirement shall include, but not be limited to: ○ Installation of secondary containment around all vehicle fueling and servicing locations on site. ○ Abundant on-site closable trash containers in which all packaging materials and trash can be placed. Frequent removal and replacement of all trash containers shall occur to ensure that adequate empty containers are on site at all times. ○ Provision of labeled and separate containers for different types of recyclable materials (metals, plastic, other) and trash (hazardous and non-hazardous). ○ Effective on-site stormwater containment during all construction and deconstruction activities that prevents any on-site water from reaching Bay and River waters. ○ All equipment and materials shall be temporarily or permanently stored or placed a sufficient distance away from the waterfront to prevent accidental releases of fuels, lubricants, fluids, packaging, etc. from quickly reaching the Napa River before corrective actions can be implemented. • For any work on or beneath fixed decking, heavy-duty mesh containment netting or other engineering approach shall be maintained below all work areas where construction discards or other debris could enter the water. • A floating containment boom, netting, or functional equivalent shall be placed around all active portions of a construction/deconstruction site where any floating debris could enter the water. Similar containment shall be placed around any locations where creosote wood pilings are being removed. Deployment anchors shall be used with all booms to ensure that the boom remains open and capable of collecting any floating debris. • All floating booms or similar containment devices used to collect floating debris as well as any temporary decking or netting placed under overwater structures shall be cleaned daily or more frequently if significant debris is being collected. During active creosote piling removal, the boom shall be cleaned hourly of any collected debris. • In addition to providing booming, a small, motored skiff/chase boat shall be on site to chase and recover any floating debris that escapes the containment booming. • Use of a grizzly screen on the dredge spoil barges during all dredging activity to separate any pieces of creosote pilings removed from the Bay floor that were broken off below the seafloor during removal. • Adequate spill prevention measures shall be in place to prevent the transfer of	

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Summary of Potentially Significant Environmental Impacts

Impact	Mitigation Measures	Level of Significance After Mitigation
	any hydrocarbon materials from entering the water while equipment is being used during construction and deconstruction, as well as when being serviced and/or parked. - Provisions shall be made to ensure that no external wrapping, internal packing materials, strapping, pallets, boxes, crates, drums, or other associated waste material from staged on-site construction materials can enter the Napa River or Bay–Delta waters.	
Impact 3.3-5: Based on the potential for underwater noise generated from impact hammer pile driving of 24-inch concrete and 30- and 36-inch steel pipe pilings for the construction of the Phase 1 wharf and Phase 2 dike, the potential impact to special-status fish species, including salmon, steelhead, sturgeon, and especially longfin and delta smelt and Sacramento splittail, would be **significant**.	**MM-3.3-5:** Impact Hammer Pile Driving Noise Reduction for Protection of Fish: Prior to the start of construction, VMT shall develop a National Oceanic and Atmospheric Administration Marine Fisheries Service (NOAA) Fisheries-approved sound attenuation reduction and monitoring plan. This plan shall provide detail on the sound attenuation system, detail methods used to monitor and verify sound levels during pile driving activities, and all BMPs to be taken to reduce impact hammer pile-driving sound in the marine environment to an intensity level of less than 183 decibels (dB). The sound monitoring results shall be made available to the NOAA Fisheries. The plan shall incorporate but not be limited to the following BMPs: - All impact pile driving for 24-inch concrete and 30- and 36-inch steel pilings, shall be conducted in strict accordance with the Long-Term Management Strategy (LTMS) work windows, during which periods the presence of special-status species in the project site is expected to be minimal. - If pile installation using impact hammers must occur at times other than the approved LTMS work window, VMT shall obtain incidental take authorization from NOAA Fisheries, and CDFW to address potential impacts on delta and longfin smelt, Sacramento splittail, Chinook salmon, steelhead trout, and green sturgeon, and to implement all requested actions to avoid impacts. - Steel sheet pile will be installed using vibratory hammers and the use of impact hammers kept to the bare minimum. - If exceedance of noise thresholds established and approved by NOAA Fisheries occur, a contingency plan using bubble curtains or an air barrier will be implemented to attenuate sound levels to below thresholds. - The hammer will be cushioned using a minimum 12-inch-thick wood cushion block during all impact hammer pile driving operations. Cushion blocks will be replaced frequently to maintain maximum sound reduction. Other BMPs will be implemented as appropriate to reduce underwater noise levels to acceptable levels.	Less than significant
Impact 3.3-6: There would be a potential for noise disturbance from proposed pile driving activities to affect marine mammals if	**MM-3.3-6:** Pile Driving Noise Reduction for Protection of Marine Mammals: As part of the NOAA Fisheries-approved sound attenuation-monitoring plan required in MM-3.3-5, VMT shall take actions in addition to those listed in MM-3.3-5 to reduce the effect of underwater noise transmission on marine mammals. These actions shall include at a minimum: - A 1,600-foot (500-meter) safety zone shall be established and maintained around the sound source, for the protection of marine mammals in the event that sound levels are unknown or cannot be adequately predicted. - Work activities shall be halted when a marine mammal enters the 1,600-foot (500-meter) safety zone and shall cease until the mammal has been gone from	Less than significant

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Impact	Mitigation Measures	Level of Significance After Mitigation
conducted when the probability of sea lions and harbor seals being present is highest. Depending on when pile driving activities would be conducted for the VMT project component, the potential effects of underwater noise from pile driving on marine mammals could be **significant.**	the area for a minimum of 15 minutes. • A "soft start" technique shall be employed in all pile driving, giving marine mammals an opportunity to vacate the area. • Sound levels below 90 A-weighted decibels (dBA) shall be maintained in air when pinnipeds (seals and sea lions) are present. • An NOAA Fisheries-approved biological monitor will conduct daily surveys before and during impact hammer pile driving to inspect the work zone and adjacent Bay waters for marine mammals. The monitor will be present as specified by NOAA Fisheries during the impact pile-driving phases of construction.	
Impact 3.3-7: The potential for impacts on sensitive species from artificial night lighting on the new wharf and dike, as well as from improved shoreside facilities and buildings, would result in a **significant impact.**	**MM-3.3-7:** Wharf Lighting: VMT shall develop and implement a wharf lighting plan that minimizes to the maximum extent practicable and with regard to operational and personnel safety, artificial lighting installed on and adjacent to the VMT wharf. This plan shall include but not be limited to: • Use of fully shielded, downward casing, low-voltage, sodium, LED, or non-yellow-red spectrum lights that are well shielded to restrict the transmittance of artificial light over the water. • Restriction of artificial lighting to those areas of the wharf and adjacent staging areas that require lighting. • Directing all wharf and near wharf lighting to illuminate only the wharf and ground and not adjacent Napa River waters or the sky.	Less than significant
Impact 3.3-8: Wharf maintenance or pile replacement would have similar potential effects and affected special-status species as initial site dredging, piling removal, and	See MM-3.8-1.	Less than significant

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Impact	Mitigation Measures	Level of Significance After Mitigation
replacement, as well as expected recovery of marine biota following the activity. Although the application of BMPs, including adherence to LTMS acceptable work windows, would reduce the potential impact to special-status species, the impact would be **significant** without mitigation**.**		
Impact 3.3-9: The staging or stockpiling of potentially toxic deconstruction debris and materials such as concrete, asphalt, contaminated sediments or other contaminant-containing materials, such as asbestos, that are awaiting disposal or reuse, as well as stockpiling new construction materials and equipment near or adjacent to the waterfront could result in the	See MM-3.3-4.	Less than significant

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Summary of Potentially Significant Environmental Impacts

Impact	Mitigation Measures	Level of Significance After Mitigation
accidental release of these materials into the Napa River and the Bay–Delta ecosystem, therein posing a significant threat and a **significant impact** to special-status species and the Bay–Delta ecosystem in general.		
Impact 3.3-10: Use of an impact hammer for pile driving of new 24-inch concrete and 30- and 36-inch steel piles can be expected to result in underwater noise levels that can result in permanent auditory damage to migrating fish, especially delta and longfin smelts, Sacramento splittail, and juvenile steelhead and salmon. This impact would be **significant**.	Refer to MM-3.3-5 above.	Less than significant
Impact 3.3-11: The proposed project could increase the risk of spreading	**MM-3.3-9:** Invasive Marine Species Control: Prior to any in-water deconstruction activities at the VMT Site, VMT shall develop and implement an Invasive Species Control Plan. The plan shall be prepared in consultation with the RWQCB, the U.S. Coast Guard, and California State Lands Commission Marine Invasive Species Program personnel. Provisions of the plan shall include but not be limited to the following:	Less than significant

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Impact	Mitigation Measures	Level of Significance After Mitigation
non-native marine species attached to wood pilings or rock armoring/riprap being removed as part of the VMT Phase 1 wharf and Phase 2 dike construction activities. Spread of non-native species would be a **significant** impact.	- Environmental training of construction personnel involved in the removal of pier pilings or intertidal or subtidal shoreline armoring/riprap to inform them about invasive marine species in San Francisco Bay that might be attached to removed structures. - Actions to be taken to prevent the release and spread of marine invasive species, especially algal species. - Procedures for the safe removal and disposal of any invasive taxa observed on the removed structures prior to disposal. - A post-construction report identifying what, if any, invasive species were found attached to removed equipment and materials and the treatment/ handling of identified invasive species.	
	Cultural Resources	
Impact 3.4-1: The proposed project would result in a **significant impact** to historic architectural resources due to the potential for damage to the administration building and garage during construction**.**	**MM-3.4-1a**: A historic preservation plan shall be prepared and implemented to aid in preserving those historic resources proposed to be retained within the original Sperry Mill site. These include the administration building and garage, the manager's house, and the barn, all of which shall be protected from direct or indirect impacts during construction activities (i.e., due to damage from operation of construction equipment, staging, material storage, and vibrations). If deemed necessary upon further condition assessment of the buildings, the plan shall include the preliminary stabilization, prior to construction, of deteriorated or damaged materials or systems that may be hazardous. At a minimum, the plan shall include: - A requirement for the placement of perimeter fencing and/or signs around the historical resources to identify them as sensitive resources to be avoided; - Guidelines for operation of construction equipment adjacent to historical resources; - Guidelines for storage of construction materials away from the resources; - Requirements for monitoring and documenting compliance with the plan; and - Education/training of construction workers about the significance of the historical resources around which they would be working. The training program shall be prepared by a historical architect and approved by Planning Division staff. The plan shall be prepared by a qualified architectural historian or historical architect who meets the Secretary of Interior's Professional Qualification Standards (36 CFR, Part 61). The plan shall be reviewed and approved by Planning Division staff. The project sponsor shall ensure that the contractor follows these plans. The protection plan, specifications, monitoring schedule, and other supporting documents shall be incorporated into the building permit application plan sets. **MM-3.4-1b**: Prior to construction, a historical architect and a structural engineer shall undertake an existing condition study of the administration building and garage. The	Less than significant

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Summary of Potentially Significant Environmental Impacts

Impact	Mitigation Measures	Level of Significance After Mitigation
	purpose of the study would be to establish the baseline condition of the structures prior to construction. The documentation shall take the form of written descriptions and visual illustrations, including those physical characteristics of the resource that convey its historical significance and that justify its inclusion on, or eligibility for inclusion on, the California Register of Historical Resources. The documentation shall be reviewed and approved by Planning Division staff. The historical architect shall make periodic site visits to monitor the condition of the resource, including monitoring of any instruments such as crack gauges. The historical architect shall consult with the structural engineer to ensure that character-defining features are protected, especially if any problems with character-defining features of the historic resource are discovered. If in the opinion of the monitoring team, substantial adverse impacts to the historic resource related to construction activities are found during construction, the monitoring team shall so inform the project sponsor or designated representative responsible for construction activities. The project sponsor shall adhere to the monitoring team's recommendations for corrective measures, including halting construction in situations where construction activities would imminently endanger the historic resource. The monitoring team shall prepare site visit reports and submit them for review and approval by Planning Division staff. **MM-3.4-1c**: Upon completion of construction activities at the proposed project site, the qualified architectural historian or historical architect shall document (e.g., with photographs and other appropriate means) the level of success in meeting the Secretary of the Interior's Standards for the Treatment of Historic Properties and in preserving the character-defining features of the identified historic resources. The documentation shall be submitted to Planning Division staff for review and approval. The project sponsor shall ensure that repairs occur in the event of damage to the historic resources during construction. Repair work shall comply with the Secretary of the Interior's Standards for the Treatment of Historic Properties and shall restore the character-defining features in a manner that does not affect the eligibility of the historic property for the California Register of Historical Resources. All repairs shall be reviewed by Planning Division staff in consultation with the architectural historian or historical architect.	
Impact 3.4-2: Implementation of the proposed project would result in a **significant impact** on historic architectural resources due to the loss of integrity of a potential Sperry	**MM-3.4-2a:** Prior to the issuance of demolition or site permits, the project sponsor shall undertake Historic American Building Survey (HABS) documentation of the subject property, structures, objects, materials, and site features. The documentation shall be undertaken by a qualified professional who meets the standards for history, architectural history, or historic architecture (as appropriate), as set forth by the Secretary of the Interior's Professional Qualification Standards (36 CFR, Part 61). The documentation shall consist of the following: **Measured Drawings** The project sponsor shall engage the services of an architectural historian to conduct research to find plans and drawings of the structures on the project site which comprise the historic resources, most importantly those of the flour mill and grain silos. If plans are found and can be made available for reproduction, they shall be reproduced on archival materials, either archival bond paper or mylar.	Significant and unavoidable

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Impact	Mitigation Measures	Level of Significance After Mitigation
Flour Mill Historic District associated with demolition of the flour mill, grain silos, and dock.	If suitable plans are not available, an architectural historian or historical architect shall prepare sketch plans for the flour mill building. One sketch plan shall be made of the ground floor (including the warehouse). Another plan shall be made of one floor of the tower portion of the flour mill. In addition, sketch floor plans shall be made of the administration building and garage. An architectural historian or historical architect shall prepare a site plan, including the manager's house and grounds. Site plans prepared by the project sponsor can be used as a base. **Photography** Large format negatives shall be required. Photography shall be undertaken by a qualified professional with demonstrated experience in Historic American Buildings Survey photography and shall follow the HABS/HAER/HALS Photography Guidelines (National Park Service, Heritage Documentation Programs, 2011). Digital prints shall be acceptable. Photography shall include context photographs, site features, and all structures on the project site that comprise the historic resources. The photographer shall consult with the architectural historian engaged in the measured drawings and historical report about the type and number of views required for the documentation of the potential historic district. **Historical Report** An architectural historian shall prepare a written Narrative Report based on HABS Guidelines for Preparing Written Historical and Descriptive Data. Carey and Company's previous report (2008) and the revised evaluation for this historic resources evaluation can be used in the preparation of the Narrative Report. The architectural historian shall make an effort to locate and conduct an oral history interview with Floyd Miller, who provided assistance with the 2008 report. All documentation shall be submitted for review and approval by Planning Division staff prior to the issuance of final building occupancy permits. The final documentation shall be disseminated to the John F. Kennedy Library, Northwest Information Center, Sonoma State University (California Historical Resource Information System), and Vallejo Naval and Historical Museum. **MM-3.4-2b:** The project sponsor shall install permanent interpretive exhibits at the Vallejo Naval and Historical Museum that provide information to visitors and occupants regarding the history of the Sperry Flour Mill. The interpretive exhibit shall utilize images, narrative history, drawings, or other archival resources. The interpretive exhibits may be in the form of, but are not necessarily limited to plaques or markers, interpretive display panels. The interpretive exhibits shall be installed at a pedestrian friendly location, and be of adequate size to attract the interested public. The project sponsor's consultant shall submit conceptual and final designs to Planning Division staff for review and approval.	
Impact 3.4-3: There is potential for the inadvertent discovery of unknown archaeological resources during ground-disturbing	**MM-3.4-3**: In the event that archaeological resources (sites, features, or artifacts) are exposed during construction activities for the proposed project or the off-site improvements, all construction work occurring within 100 feet of the find shall immediately stop until a qualified archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards, can be retained to evaluate the significance of the find and determine whether additional study is warranted. Depending on the significance of the find under the California Environmental Quality Act (CEQA) (14 CCR 15064.5(f); California Public Resources Code, Section 21082), the archaeologist may record the find and allow	Less than significant

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Impact	Mitigation Measures	Level of Significance After Mitigation
activities associated with project construction which could lead to a **significant impact** to archaeological resources.	work to continue. If the discovery proves significant under CEQA, additional work such as preparation of an archaeological treatment plan, testing, or data recovery may be warranted.	
Impact 3.4-4: There is potential for the inadvertent discovery of unknown archaeological resources during ground-disturbing activities associated with the off-site improvements, which could lead to a **significant impact** to archaeological resources.	Refer to MM-3.4-3 above.	Less than significant
Impact 3.4-5: Construction and excavations for structures on the site could result in incidental disturbance to native sedimentary rock and, although low, potential remains for deep excavations to uncover significant fossils, which would result in a **significant impact.**	**MM-3.4-4:** If potential fossils are discovered by construction crews, all earthwork or other types of ground disturbance within 50 feet of the find shall stop immediately until a qualified professional paleontologist can assess the nature and importance of the find. Based on the scientific value or uniqueness of the find, the paleontologist may record the find and allow work to continue, or recommend salvage and recovery of the fossil. If treatment and salvage is required, recommendations shall be consistent with Society of Vertebrate Paleontology 1995 guidelines and currently accepted scientific practice, and shall be subject to review and approval by the City. Work in the affected area may resume once the fossil has been assessed and/or salvaged and the City—in consultation with the professional paleontologist—has provided written approval to resume work.	Less than significant

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Impact	Mitigation Measures	Level of Significance After Mitigation
Impact 3.4-6: Although the potential for human remains on the project site and within the off-site improvement areas is very low, in the event that human remains are found during project construction, impacts would be potentially **significant.**	**MM-3.4-5:** In accordance with Section 7050.5 of the California Health and Safety Code, if human remains are encountered by project personnel, the County Coroner shall be notified within 24 hours of the discovery. No further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains shall occur until the County Coroner has determined, within 2 working days of notification of the discovery, the appropriate treatment and disposition of the human remains. If the County Coroner determines that the remains are, or are believed to be, Native American, he or she shall notify the Native American Heritage Commission (NAHC) in Sacramento within 48 hours. In accordance with California Public Resources Code Section 5097.98, the NAHC must immediately notify those persons it believes to be the most likely descendent (MLD) of the deceased Native American. The MLD shall complete their inspection within 48 hours of being granted access to the site. The designated Native American representative shall then determine, in consultation with the property owner, disposition for the human remains.	Less than significant
Impact 3.4-7: Although the potential for human remains within the off-site improvement areas is very low, in the event that human remains are found during implementation of the off-site improvements, impacts would be **potentially significant.**	Refer to MM-3.4-5 above.	Less than significant
	Geology and Soils	
Impact 3.5-1: Although project plans include provisions of retaining walls to protect the site, proper design of remedial systems would require more detailed study as design of the	**MM-3.5-1 :** Maintenance of Adequate Slope Stability. Prior to approval of final project designs, the applicants shall: (a) Prepare and submit for review construction-level plans for the catchment and retaining wall to be placed at the toe of the slope on the Orcem Site; and (b) Prepare and submit for review construction-level plans and a supplemental soil engineering review to demonstrate that proposed final design slopes on the VMT Site (including riprap dikes) would maintain adequate factors of safety under both static and pseudo-static conditions. The supplemental investigation shall include additional exploratory borings, trenching, laboratory testing, and geologic analyses, as necessary, to ensure the analysis is based on the proper distribution and characteristics of earth materials, and adequately informs the final designs of proposed retaining walls and riprap dikes. The acceptable level of stability (i.e., seismic and static factor of safety (FOS) values) shall be determined by the geotechnical consultant in consultation with the City of	Less than significant

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Impact	Mitigation Measures	Level of Significance After Mitigation
project proceeds to final stages. Therefore, impacts would be **significant** prior to mitigation.	Vallejo Building Division; but in no case shall be below a static FOS of 1.5 or a pseudo static FOS of 1.15. All slope stability evaluations shall be prepared and stamped by a registered geotechnical engineer or engineering geologist, and reviewed and approved by the City of Vallejo Building Division prior to approval of final building plans.	
	Greenhouse Gas Emissions	
Impact 3.6-1: The proposed project would exceed the BAAQMD CEQA level of significance of 10,000 metric tons carbon dioxide equivalent (MT CO_2E) per year. Impacts would be **significant.**	**MM-3.6-1:** The following measures are required to be implemented to reduce greenhouse gas (GHG) emissions associated with operation of the proposed project: • Fuel used in all on-site equipment shall initially consist of 20% biodiesel (a fuel blend of 20% biodiesel in 80% petroleum diesel). As production increases, the biodiesel content of the fuel shall be increased as feasible. The applicants shall conduct annual reviews regarding the availability of technically equivalent or better technologies and report to the City. If the technology is determined to be feasible in terms of cost and technical and operational feasibility, the applicants shall implement such technology. • Fuel supply shall consist of compressed natural gas for forklifts and front-end loaders.	Significant and unavoidable
Impact 3.6-2: It cannot be guaranteed that the proposed project would be consistent with the overarching objective of the City's Climate Action Plan (CAP) to achieve the reduction targets as established for 2020 and 2035 because the City's adopted CAP does not cover marine and rail operations. Impacts could be considered **significant.**	**MM-3.6-2a:** Orcem and VMT shall encourage employee commute alternatives such as carpooling and biking options by providing information to employees about alternative transportation, providing subsidized bus passes, and including employee showers on site. As part of this effort, Orcem and VMT shall implement an employee worker ridership program to encourage alternative work commute options to reduce single-occupancy vehicle trips during project operation. A commute program manager shall be designated to provide information to employees using the Bay Area Air Quality Management District 511 services (accessed at www.511.org) or a similar Bay Area transit information provider. The program shall include a provision to notify all future employees of the worker ridership program prior to the start of project operations and shall notify employees of the 511 RideMatch Service (available at https://www.ridematch.511.org/SanFrancisco/TDMRegistration.jsp?idScreen=REGISTRN1) or similar communication method, to ensure personnel can identify potential carpooling program participants. All Orcem and VMT employees shall be encouraged through the program to create an account with 511 (at https://my511.org/) or create an account with a similar transit information provider. Personal accounts will allow employees to log their commute activity, identify rideshare options, use alternative transportation features and trip planning services, and other features to encourage alternative commute methods. Additional resources Orcem and VMT may utilize for the implementation of an alternative commute program can be found at: http://rideshare.511.org/employers/downloads.aspx. **MM-3.6-2b:** Orcem and VMT shall either eliminate the use of turf in landscaping, or landscape the site with native vegetation and minimize the use of turf, in order to reduce	Significant and unavoidable

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Impact	Mitigation Measures	Level of Significance After Mitigation
	the need for gas-powered lawn and garden equipment. **MM-3.6-2c:** Orcem and VMT shall use drought-tolerant plant types, where landscaping is proposed, in order to minimize the use of water. **MM-3.6-2d:** Orcem and VMT shall use greywater, recycled water, and rainwater catchment systems for irrigation, if feasible, for proposed landscape areas. If at least one of these alternative water sources are not employed, Orcem and VMT shall demonstrate infeasibility to the City.	
Impact 3.6-3: It cannot be guaranteed that the proposed project would be consistent with the overarching objective of the City's CAP to achieve the reduction targets as established for 2020 and 2035, or the state's GHG reduction goals for 2030 and 2050 because the City's adopted CAP does not cover marine and rail operations. Impacts would be **significant.**	See MM 3.6-2a through 3.6-2d above.	Significant and unavoidable
Impact 3.6-4: The VMT project component would be subjected to buoyancy/uplift forces during extreme tidal events, as well as daily submergence	**MM-3.6-3:** Structural members associated with the VMT deep-water terminal construction, including wharf improvements and other components that would be affected by sea level rise, shall be designed to resist extreme tidal event loads and continual salt water submergence to the satisfaction of the City engineer.	Less than significant

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Impact	Mitigation Measures	Level of Significance After Mitigation
during high tides, as a result of projected SLR. Impacts would be **significant.**		
Hazards and Hazardous Materials		
Impact 3.7-1: Construction of the proposed project would require the temporary use of hazardous materials, such as diesel fuels, lubricants, solvents, and asphalt. Although adherence to the construction specifications and applicable regulations regarding hazardous materials would reduce impacts during construction of the proposed project, impacts would be **significant** without proper mitigation**.**	**MM-3.7-1a:** Hazardous materials shall not be disposed of or released onto the ground, the underlying groundwater, or any surface water. Totally enclosed containment shall be provided for all trash. All construction waste, including trash and litter, garbage, other solid waste, petroleum products, and other potentially hazardous materials, shall be removed to a waste facility permitted to treat, store, or dispose of such materials. **MM-3.7-1b:** A Hazardous Materials Management Plan shall be prepared to discuss hazardous materials management, handling, storage, disposal, and emergency response planning to be implemented during construction. Hazardous materials spill kits shall be maintained on site for small spills.	Less than significant
Impact 3.7-2: Since the VMT component of the project would require the transportation and/or disposal of potentially contaminated dredged material from Mare Island	See MM-3.8-1.	Less than significant

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Impact	Mitigation Measures	Level of Significance After Mitigation
Strait, impacts would be **significant** without mitigation.		
Impact 3.7-3: Due to the potential presence of asbestos-containing materials (ACMs), lead-based paints, polychlorinated biphenyl (PCB)-containing equipment, mercury-containing equipment, mold growth, and chemical supplies within the project site, project construction could result in a **significant impact** due to the transport and/or disposal of these materials.	See MM-3.8-2. **MM-3.7-2a**: An abatement work plan shall be prepared in compliance with local, state, and federal regulations for any necessary removal of such materials. The work plan shall include a monitoring plan to be conducted by a qualified consultant during abatement activities to ensure compliance with the work plan requirements and abatement contractor specifications. Demolition plans and contract specifications shall incorporate any necessary abatement measures for the removal of materials containing asbestos. The measures shall be consistent with the abatement work plan prepared for the project and conducted by a licensed lead/asbestos abatement contractor. Asbestos abatement shall be conducted in coordination with the Bay Area Air Quality Management District, in accordance with District Regulation 11-2-401.3. **MM-3.7-2b**: A California Department of Health Services (DHS)-certified lead inspector shall survey the buildings for the presence of lead-based paint. Additionally, a qualified environmental specialist shall inspect the site buildings for the presence of polychlorinated biphenyls (PCBs), mercury, and other hazardous building materials prior to demolition. If found, these materials shall be managed in accordance with the Metallic Discards Act and other state and federal guidelines and regulations. Demolition plans and contract specifications shall incorporate any necessary abatement measures in compliance with the Metallic Discards Act of 1991 (Public Resource Code Sections 42160–42185), particularly Section 42175, Materials Requiring Special Handling for the removal of mercury switches, PCB-containing ballasts, and refrigerants. Lead abatement shall be conducted in accordance with California DHS requirements. **MM-3.7-2c**: A Waste Management and Reuse Plan shall be prepared to discuss the types of wastes anticipated to be generated during construction and operation, the proposed waste handling procedures, proposed waste storage locations, inspection procedures, and proposed waste disposal. The Waste Management and Reuse Plan will also discuss waste minimization and the reuse of demolished site building materials on site. The plan shall discuss estimated quantities of on-site building materials to be reused, the proposed processing of such materials, the proposed disposition of such materials, and the proposed screening and testing procedures to be used to ensure the material reuse will not impact human health or the environment. Material screening shall include visual observation for the presence of oil-stained concrete. Oil-stained concrete shall be disposed of off site and excluded from on-site reuse.	Less than significant
Impact 3.7-4: There is potential for contaminated soils or	**MM-3.7-3:** In the event that site grading activities will encounter evidence of contamination or other environmental concerns, a Hazardous Materials Contingency Plan shall be followed during excavation at the subject property. The plan shall (1) specify measures to be taken to protect worker and public health and safety and (2) specify measures to be	Less than significant

Table ES-1
Summary of Potentially Significant Environmental Impacts

Impact	Mitigation Measures	Level of Significance After Mitigation
groundwater to be encountered by workers during excavation and grading on the project site. Therefore, impacts would be **significant.**	taken to identify, manage and remediate wastes. The plan should include the following: • Identification of the known former storage tank and soil contamination areas. • Information on how to identify suspected contaminated soil. • Worker health and safety monitoring procedures, including monitoring for organic vapors using a photoionization detector (PID) or other organic vapor analyzer and monitoring dust levels. Organic vapor action levels will be established based on Occupational Safety and Health Administration (OSHA) permissible exposure limits (PELs). Dust action levels will be established based on use of the known arsenic soil concentrations, the PEL, and a factor of safety. • Procedures for temporary cessation of construction activity and evaluation of the level of environmental concern. • Procedures for limiting access to the contaminated area to properly trained personnel. • Procedures for notification and reporting, including internal management and local agencies (fire department, Department of Environmental Health, Air Pollution Control District, etc.), as needed. • A worker health and safety plan for excavation of contaminated soil. • Procedures for characterizing and managing excavated soils. • Procedures for certification of completion of remediation.	
Impact 3.7-5: The use of excavators, backhoes, and other mechanical means to physically grab onto and attempt to free derelict creosote pilings from the seafloor may result in the piling disintegrating into a multitude of wood fragments, exposing previously unweathered polycyclic aromatic hydrocarbons (PAH)-laden creosote to the	See MM 3.3-3.	Less than significant

Table ES-1
Summary of Potentially Significant Environmental Impacts

Impact	Mitigation Measures	Level of Significance After Mitigation
marine environment. These construction-related effects would present a **significant impact.**		
Impact 3.7-6: Operations at the VMT Site would include rail, cargo ship, truck traffic, and worker vehicles, which if involved in an accident could cause the release of fuels and/or commercial products (potentially containing hazardous materials) to the environment. Therefore, impacts would be **significant.**	**MM-3.7-4:** Emergency Response Plan. Both the Orcem and VMT facilities shall prepare an emergency response plan for project operations which establishes responsibilities, procedures, and a chain of command to follow in the event of a fire, vehicle/truck collision, train derailment, or cargo ship incident. The plan shall include general notification requirements to local and regional agencies with emergency response capabilities of the location and operational profile of the project, including address, directions, lists of hazardous materials stored on site, and access information. Information must be sufficient in detail to allow quick recognition and access in the event of an emergency. The plan shall require coordination with local first responders and emergency planning agencies (e.g., Water Emergency Transportation Authority (WETA), U.S. Army Corps of Engineers (USACE), fire department, medical facilities, City/County emergency operations center, and County hazardous materials teams) in the event of an emergency situation. The plan shall outline responsibilities and notification requirements for each type of accident or upset condition that may occur on site. The plan shall designate staff persons responsible for addressing and immediately responding to hazardous materials leaks or spills, and shall establish training and record keeping requirements to ensure such teams are qualified and trained in the California Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response Standard (HAZWOPER). The plan shall include procedures for the assessment and cleanup of any on-site spills or leaks resulting from emergency or upset conditions.	Less than significant
Impact 3.7-7: Operations at the Orcem Site would include truck traffic and worker vehicles, and industrial processes which if involved in an accident could cause the release of fuels and/or commercial products (potentially	See MM-3.7-4 above.	Less than significant

Table ES-1
Summary of Potentially Significant Environmental Impacts

Impact	Mitigation Measures	Level of Significance After Mitigation
containing hazardous materials) to the environment. Therefore, impacts would be **significant.**		
Impact 3.7-8: The proposed removal of the deteriorated docks located at the northern end of the City of Vallejo Municipal Marina could result in the release of PAH in the water, which would constitute a **significant impact.**	See MM-3.3-3 above**.**	Less than significant
	Hydrology and Water Quality	
Impact 3.8-1: Construction of the VMT component of the project would result in a **significant impact** due to potential impacts on marine water quality from material dredging, removal of creosote pilings, and use of Class 2 aggregate for riprap.	**MM-3.8-1 :** Dredged Material Management Plan. Prior to both Phase 1 and Phase 2 of the VMT project component, the applicant shall develop a dredged material management plan to outline procedures necessary to evaluate the suitability of dredged materials for either on-site beneficial reuse or in-bay disposal at the Carquinez disposal or other approved site. The purpose of the plan shall be to ensure that dredged materials are handled in a manner that is consistent with the San Francisco Bay Long-Term Management Strategy for Dredging developed cooperatively by the U.S. Environmental Protection Agency (EPA), U.S. Army Corps of Engineers (USACE), the San Francisco Regional Water Quality Control Board (RWQCB), and the Bay Conservation and Development Commission (BCDC). The plan shall include screening and testing guidelines necessary to ensure dredged materials may be reused on-site without resulting in potentially adverse impacts on water quality and aquatic biota. The dredged material management plan shall be prepared and implemented by a qualified professional geochemist or water quality expert with relevant Bay–Delta project experience. In consultation with San Francisco Bay RWQCB and BCDC staff, and in consideration of the applicable water quality objectives and known water quality impairments within receiving waters, the plan shall outline the type and frequency of testing that would be required as materials are dredged out of the Bay. The plan shall develop site-specific thresholds that would indicate the material is suitable for on-site reuse using input from the San Francisco Bay RWQCB and the following document: *Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines*. Testing protocols from	Less than significant

Table ES-1
Summary of Potentially Significant Environmental Impacts

Impact	Mitigation Measures	Level of Significance After Mitigation
	Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. – Testing Manual (Inland Testing Manual) shall also be incorporated into the plan where applicable. The USACE, the San Francisco Bay RWQCB, and the BCDC shall have review and approval authority over the plan. During dredging operations, the applicant shall submit monthly reports to each agency describing the volume and destination (i.e., on-site, in-bay, or ocean) of dredged materials, with testing results justifying the decision. **MM-3.8-2:** Riprap and Aggregate Sourcing. Prior to construction of wharf and dike improvements, the applicant shall disclose to the U.S. Army Corps of Engineers (USACE), the San Francisco Bay Regional Water Quality Control Board (RWQCB), and the Bay Conservation and Development Commission (BCDC) the source and volume of the Class II aggregate and riprap to be used in construction of the rock dike and backfill materials. For materials proposed to be reused from on-site demolition activities, the applicant shall demonstrate to the satisfaction of the agencies that such reuse would not result in release or leaching of contaminants into the water column. The applicant shall describe screening and testing procedures to be used to ensure that rock and aggregate materials do not contain legacy contaminants that could violate water quality objectives or result in substantial adverse impacts on aquatic biota when placed along the shoreline. All materials to be used in the construction of the riprap dike and shoreline backfill shall be subject to approval by the San Francisco Bay RWQCB and the BCDC. See MM-3.3-3 and MM-3.3-4.	
Impact 3.8-2: The proposed removal of the deteriorated docks located at the northern end of the City of Vallejo Municipal Marina could result in **significant impacts** to water quality related to removal of creosote pilings.	See MM-3.3-3.	Less than significant
	Land Use and Planning	
No significant impacts.	No mitigation required.	N/A
	Noise	
Impact 3.10-1: The following two	**MM-3.10-1a:** VMT shall work with the California Northern Railroad to upgrade the existing track and any new track to a Continuous Welded Rail (CWR) which will remove the joints	Significant and

Table ES-1
Summary of Potentially Significant Environmental Impacts

Impact	Mitigation Measures	Level of Significance After Mitigation
locations would experience an increase in noise levels that would exceed established policies and standards as a result of the VMT project component, and therefore the operational impacts would be **significant**: • NSL5 (Colt Court Residences) • NSL10 (3rd Street Residence)	and provide a smooth continuous surface for rolling stock. Successful application of this measure would reduce the noise levels generated by rolling stock movements by 5 decibels (dB). The goal of this mitigation is to upgrade to CWR for all tracks as far as the junction with Chestnut Street to the north of the site. Figure 3.10-8 illustrates the extent of the CWR that is the goal under this mitigation. **MM-3.10-1b:** In order to mitigate excess noise generated by loading material into the rail and barge hoppers due to the impact of stone/gravel on the metal walls of the hopper, hoppers shall be lined with a rubber wearing sheet. Application of this measure would reduce hopper noise by 10 decibels (dB).	unavoidable
Impact 3.10-2: The following three locations would be exposed to an increase in noise levels that exceed the applicable policies and standards as a result of the Orcem project component: • NSL2 (Seawitch Lane Residences) • NSL3 (Harbor Park Apartments) • NSL4 (Browning Way	**MM-3.10-2:** In order to reduce the noise impact of the plant operation, a series of improvements are required for specific items in the plant as follows. • An in-line attenuator shall be incorporated between the main fan (561-FN1) and the stack exhaust, offering minimum insertion losses as per Table 3.10-31. • Local screening shall be provided adjacent to the clinker store bag filter fan (513-FN1) to reduce the noise level by 19 decibels (dB). • Local screening shall be provided adjacent to the bag filter fan (521-FN1) to reduce the noise level by 18 dB. • Local screening shall be provided adjacent to the air shock (531-AB1) to reduce the noise level by 9 dB. • Local screening shall be provided adjacent to the main fan (561-FN1) to reduce the noise level by 9 dB. • Local screening shall be provided adjacent to the bag filter fan on the intake Silo (521-FN2) to reduce the noise level by 8 dB. • Local screening shall be provided adjacent to the air slide fans within the filter building (591-FA1, 591-FA2, 591-FA3) to reduce the noise level by 7 dB. • Local screening shall be provided adjacent to the filter building bag filter fan (591-FN1) and the silo fan (591-FN3) to reduce the noise emission of each source by 3 dB.	Less than significant

Table ES-1
Summary of Potentially Significant Environmental Impacts

Impact	Mitigation Measures	Level of Significance After Mitigation
Residences) Therefore, operational noise impacts of the Orcem project component would be **significant.**		
Impact 3.10-3: The VMT project component would generate significant groundborne vibrations as a result of rail operations due to rolling stock on the existing jointed track; this is considered a **significant** vibration impact.	See MM-3.10-1a.	Significant and unavoidable
Impact 3.10-4: the following two locations would experience a significant permanent increase in the ambient noise level as a result of VMT operations: • NSL5 (Colt Court Residences) • NSL10 (3rd Street Residence) Therefore, the VMT project component would result in a **significant** impact.	See MM-3.10-1a and MM-3.10-1b.	Significant and unavoidable

Table ES-1
Summary of Potentially Significant Environmental Impacts

Impact	Mitigation Measures	Level of Significance After Mitigation
Impact 3.10-5: The following three locations would be exposed to a significant permanent increase in ambient noise levels: • NSL2 (Seawitch Lane Residences) • NSL3 (Harbor Park Apartments) • NSL4 (Browning Way Residences) Therefore, operational noise impacts of the Orcem project component would be **significant.**	See MM-3.10-2.	Less than significant
Impact 3.10-6: Construction of the VMT project component would result in a substantial temporary increase in ambient noise levels in the vicinity of the VMT construction areas. This is considered a **significant** short-term,	**MM-3.10-3a:** The following measures shall be adhered to during construction of the VMT facility. • All construction equipment must have appropriate sound-muffling devices, which shall be properly maintained and used at all times such equipment is in operation. • Where feasible, the project contractor shall place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the project site. • The construction contractor shall locate on-site equipment staging areas so as to maximize the distance between construction-related noise sources and noise-sensitive receptors nearest the project site. • Except as otherwise permitted, construction activities shall be restricted to the hours of 7:00 a.m. to 9:00 p.m. Monday to Saturday. Construction shall be prohibited on Sundays. • Large pot-holes or rough pavement along Derr Avenue and Lemon Street within 0.50 mile of the plant shall be repaired in accordance with standards as determined necessary and feasible by the Vallejo Public Works Director to reduce roadway noise from construction vehicle and equipment transport..	Less than significant

Table ES-1
Summary of Potentially Significant Environmental Impacts

Impact	Mitigation Measures	Level of Significance After Mitigation
temporary, noise impact.	**MM-3.10-3b:** The following measures shall be required in order to lessen pile-driving noise impacts. • Use a timber cushion block between the pile and hammer head to reduce impact noise. • Correct alignment of pile and rig to reduce noise from pile guides and attachments. • Use acoustic screens or efficient sound reducing exhausts to power units.	
Impact 3.10-7: Construction of the Orcem project component would result in a substantial temporary increase in ambient noise levels in the vicinity of the Orcem construction areas. This is considered a **significant** short-term, temporary, noise impact.	**MM-3.10-4:** The following measures shall be adhered to during construction of the Orcem facility. • All construction equipment must have appropriate sound-muffling devices, which shall be properly maintained and used at all times such equipment is in operation. • Where feasible, the project contractor shall place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the project site. • The construction contractor shall locate on-site equipment staging areas so as to maximize the distance between construction-related noise sources and noise-sensitive receptors nearest the project site. • Except as otherwise permitted, construction activities shall be restricted to the hours of 7:00 a.m. to 9:00 p.m. Monday to Saturday. Construction shall be prohibited on Sundays.. • The project applicant shall establish and maintain a hot-line for the duration of the construction period to receive and respond to noise complaints.	Less than significant
Impact 3.10-8: The combined effects of construction of the VMT and Orcem project components would result in a substantial temporary increase in ambient noise levels in the vicinity of the project site. This would constitute a **significant** impact.	See MM 3.10-3a, MM-3.10-3b, and MM 3.10-4.	Less than significant

Table ES-1
Summary of Potentially Significant Environmental Impacts

Impact	Mitigation Measures	Level of Significance After Mitigation
Public Services and Recreation		
No significant impacts.	No mitigation required.	N/A
Transportation and Traffic		
Impact 3.12-1: Construction of the proposed project would result in temporary impacts on traffic operations and non-vehicular mobility**.** Impacts would be **significant.**	**MM-3.12-1:** The City of Vallejo shall require that a Construction Traffic Management Plan be developed as part of a larger Construction Management Plan to address potentially significant impacts during construction of the VMT and Orcem project components. As part of the plan development, the project applicants and their construction contractors shall meet with appropriate City of Vallejo departments to determine traffic management strategies to reduce, to the maximum extent feasible, traffic congestion and the effects of parking demand by construction workers during construction of the projects and other nearby projects that could be simultaneously under construction. The project applicants shall develop the plans for review and approval by the appropriate City departments. The plans shall include at least the following items and requirements: A) A set of comprehensive traffic control measures, including scheduling of major truck trips and deliveries to avoid peak traffic hours, detour signs if required, lane closure procedures, signs, cones for drivers, and designated construction access routes. B) Notification procedures for adjacent property owners and public safety personnel regarding when major deliveries, detours, and lane closures will occur. C) Location of construction staging areas for materials, equipment, and vehicles at an approved location. D) A process for responding to, and tracking, complaints pertaining to construction activity, including identification of an on-site complaint manager. The manager shall determine the cause of the complaints and shall take prompt action to correct the problem. A complaint manager shall be designated and their name and phone number shall be provided to Planning and Zoning prior to the issuance of the first permit issued by Building Services. E) Provision for accommodation of pedestrian flow. F) Provision for parking management and spaces on the project site for all construction workers to ensure that construction workers do not park in on-street spaces. G) Any damage to the street caused by heavy equipment, or as a result of this construction, shall be repaired, at the project applicant's expense, within 1 week of the occurrence of the damage (or excessive wear), unless further damage/excessive wear may continue; in such case, repair shall occur prior to issuance of a final inspection of the building permit and in coordination with MM-3.12-4a. All damage that is a threat to public health or safety shall be repaired immediately. The street shall be restored to its condition prior to the new construction as established by the City Building Inspector and/or photo documentation, at the project sponsor's expense, before the issuance of a Certificate of Occupancy. H) Any heavy equipment brought to the construction site shall be transported by truck, where feasible. I) No materials or equipment shall be stored on the traveled roadway at any time. J) Prior to construction, a portable toilet facility and a debris box shall be installed on the site, and properly maintained through project completion.	Less than significant

Table ES-1
Summary of Potentially Significant Environmental Impacts

Impact	Mitigation Measures	Level of Significance After Mitigation
	K) All equipment shall be equipped with mufflers. L) Prior to the end of each work day during construction, the contractor or contractors shall pick up and properly dispose of all litter resulting from or related to the project, whether located on the property, within the public rights-of-way, or properties of adjacent or nearby neighbors.	
Impact 3.12-2: The proposed project would cause substantial delays and queues at rail crossings (delays of over 1 minute during peak hours, or queues that block upstream intersections during the day and early evening when traffic volumes are at or near their peak hour levels) relative to delays and queues without the project. Impacts would be **significant.**	**MM-3.12-2a:** The applicants shall work with the California Northern Railroad to limit train movements through Vallejo to between 9:00 a.m. and 4:00 p.m., thus minimizing the traffic queueing associated with the train movements across the grade crossings throughout the city during peak commute hours. **MM-3.12-2b:** Prior to the issuance of permits for rail operations, the project applicants shall notify the police and fire departments of proposed rail operations and potential delays to facilitate alternative routing during emergencies.	Significant and unavoidable
Impact 3.12-3: The proposed project would cause substantial delays and queues at rail crossings (delays of over 1 minute during peak hours, or queues that block upstream intersections during the day and early evening when traffic volumes are at or near their peak hour levels) relative to	See MM-3.12-2a and MM-3.12-2b above.	Significant and unavoidable

Table ES-1
Summary of Potentially Significant Environmental Impacts

Impact	Mitigation Measures	Level of Significance After Mitigation
delays and queues in the Cumulative No Project condition. Impacts would be **significant.**		
Impact 3.12-4: The proposed project would require physical improvements to Lemon Street in order to provide safe and efficient vehicle movements. This impact would be **significant**.	**MM-3.12-3:** To provide for the safe movement of project trucks along with other existing pedestrian, bicycle, and vehicular traffic on Lemon Street between the project site and Sonoma Boulevard and through the intersection of Lemon Street/Sonoma Boulevard, the applicants shall retain the services of a qualified engineer to prepare a structural pavement assessment for this segment of roadway, which shall be submitted for review and approval by the City Public Works Department. The assessment shall evaluate the existing pavement condition/strength against the project's demands utilizing methodology acceptable to the City, and shall identify recommended improvements (for example, overlay, reconstruction, base repair, etc.) necessary to meet this demand, based on the schedule of combined VMT and Orcem truck traffic. The City shall determine the project's fair-share allocation of costs in relationship to overall improvement costs, and all necessary improvements shall be made prior to the issuance of a certificate of occupancy. In addition, the applicants shall work with the City of Vallejo Public Works Department to identify, design, and prepare a cost estimate for those physical improvements necessary to provide adequate sight distance and maneuvering capacity for trucks along this segment of roadway, including the intersection at Lemon Street/Sonoma Boulevard. The needed improvements may include for example, centerline striping, potential on-street parking changes, sidewalk gap closures and widenings. The applicants shall provide an engineer's cost estimate for the improvements, to be approved by the Public Works Department. The Public Works Department shall determine the project's fair-share cost allocation for the necessary improvements. All necessary improvements shall be constructed prior to to the issuance of a certificate of occupancy.	Less than significant
Impact 3.12-5: The proposed project would have a substantial effect on emergency access, based on the potential delays generated by train crossings at the grade crossings in Vallejo, American Canyon, and crossings further north. Impacts would be **significant.**	See MM-3.12-2a and MM-3.12-2b above.	Significant and unavoidable

Table ES-1
Summary of Potentially Significant Environmental Impacts

Impact	Mitigation Measures	Level of Significance After Mitigation
Impact 3.12-6: The proposed project's added operational auto and truck trips on Lemon Street would make local vehicle, pedestrian, and bicycle movements unsafe or less convenient. Impacts would be **significant.**	**MM-3.12-4:** The project applicants shall work with the City of Vallejo to identify, design, and construct improvements on Lemon Street between the project site and Curtola Parkway, where not already funded or completed, based on the project truck traffic phasing, to provide for safe movement of pedestrians and bicycles along and across this section of roadway, and to provide for the safe movement of project trucks through portions of this roadway where existing residential driveways take direct access, consistent with the applicable General Plan policies (see Section 3.12.1). Improvements may include, but are not limited to, the following: • Provision of continuous 4-foot minimum-width sidewalks from Alden Street to Curtola Parkway, including closure of all gaps. • Installation of high-visibility crosswalks (i.e., continental or zebra striping), , and installation of pedestrian hybrid beacon or rectangular rapid flashing beacon devices if indicated by an engineering study), with curb extensions where feasible, at high-pedestrian use intersections as identified by the Public Works Department, including the intersections of Lemon Street with Sheridan Street, Lincoln Highway, Sonoma Boulevard, and Porter Street. • Lowering of the speed limit to 25 miles per hour (mph), subject to an engineering and traffic survey supporting the speed zone. The project applicant shall be responsible for funding of the study and the actual costs of signage and street markings. The project applicants shall provide an engineer's cost estimate for the necessary improvements, to be approved by the Public Works Department. The Public Works Department shall determine the project's fair-share costs allocation for the necessary improvements. The necessary improvements shall be constructed prior to the issuance of a certificate of occupancy.	Less than significant
Utilities and Service Systems		
No significant impacts.	No mitigation required.	N/A

ES.7 ANALYSIS OF ALTERNATIVES

ES.7.1 Alternatives Analyzed

Two alternatives to the proposed project, including the No Project Alternative, were analyzed in Chapter 6, Alternatives. The No Project Alternative is a required element of an EIR pursuant to Section 15126.6(e) of the CEQA Guidelines that examines the environmental effects that would occur if the project were not to proceed. The other alternative is discussed as part of the "range of reasonable alternatives" selected by the City. The alternatives addressed in Chapter 6 are described below.

No Project Alternative

Under the No Project Alternative, the project site would remain in its current condition. No buildings would be demolished, and no construction of new buildings or structures would occur. The existing wharf structures would also remain and there would be no dredging or filling of Mare Island Strait. No new operations would be introduced and the project site would remain vacant.

The No Project Alternative would not meet any of the project objectives since the site would remain unchanged. No new employment opportunities nor increased tax revenues would be generated on the site. The site would not be developed into a marine terminal and would not provide for the production of GGBFS; therefore, the objectives related to maximizing the capabilities of the site for shipping and GGBFS production would not be achieved under this alternative.

Revised Operations Alternative

Under the Revised Operations Alternative, the overall operations of the proposed project would be modified to decrease potential project impacts related to air quality, GHG emissions, and transportation and traffic. The Revised Operations Alternative would develop the project site in an identical manner as the proposed project; however, the operation of each project component would be altered, with the resulting reductions in impacts, as outlined below. These alterations to the project components include: (1) reducing the maximum length of trains used by the proposed project from 77 cars to 50 cars per train; (2) subjecting the VMT component of the project to a permit from the BAAQMD to regulate stationary on-site equipment, thereby subjecting it to BACT technology and making the VMT component eligible for NO_x offsets to avoid significant air quality impacts; (3) implementing a refined truck loading and weight confirmation system for the Orcem component to improve the efficiency of tanker trucks leaving the site that would increase the finished product loads from 25 to 26 tons; (4) revising operation of the VMT and Orcem components through ongoing fleet and equipment management activities to reduce NO_X emissions; and (5) offsetting any remaining VMT and Orcem emissions of NO_x, ROG, $PM_{2.5}$, or PM_{10} through purchase of credits in a BAAQMD-certified emission bank program to below a level of significance.

ES.7.2 Environmentally Superior Alternative

The No Project Alternative would result in the least environmental impacts and would be the environmentally superior alternative. However, Section 15126.6(e)(2) of the CEQA Guidelines states that if the environmentally superior alternative is the No Project Alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives. In this case, the environmentally superior alternative is the Revised Operations Alternative since it would avoid the significant and unavoidable impacts to air quality and reduce impacts related to GHG emissions and traffic. The Revised Operations Alternative would also meet all of the project objectives.

ES.8 AREAS OF CONTROVERSY

Section 15123 (b)(2) of the CEQA Guidelines requires the Executive Summary of an EIR to disclose areas of controversy known to the lead agency that have been raised by the agencies and the public. The City circulated a Notice of Preparation (NOP) to solicit agency and public comments on the scope and environmental analysis to be included in the EIR. A total of 14 comment letters were received during the NOP public review period. Copies of the NOP and the NOP comment letters received by the City are included in Appendix A to this EIR. The following issues were raised in the written responses to the NOP:

- Impacts to ferry services during construction and operation
- Need for a complete project description
- Direct and indirect impacts to biological resources, including special-status species
- Terminology used to describe the product proposed to be manufactured on the site
- Impacts to the existing sanitary sewer lines within the project site
- Impacts to air quality
- Potential for hazards and hazardous emissions
- Increase in traffic on nearby roads and streets
- Impacts on water quality

ES.9 ISSUES TO BE RESOLVED BY LEAD AGENCY

Section 15123(b)(3) of the CEQA Guidelines requires that an EIR contain a discussion of issues to be resolved. With respect to the proposed project, the key issues to be resolved include decisions by the City, as lead agency, as to:

- Whether this environmental document adequately describes the environmental impacts of the proposed project.
- Whether the recommended mitigation measures should be modified and/or adopted.
- Whether there are other mitigation measures or alternatives that should be considered for the proposed project besides those identified in the Draft EIR.

CHAPTER 1
INTRODUCTION

This Environmental Impact Report (EIR) assesses the potentially significant environmental effects of a proposed project in the City of Vallejo (City) to revitalize and repurpose the site formerly occupied by a General Mills production facility. Vallejo Marine Terminal LLC (VMT) and Orcem California Inc. (Orcem) have submitted applications for Major Use Permits and Site Development Permits with the goal of establishing a marine terminal and processing facility for the production of high-performance cement material (proposed project).

As described in the California Environmental Quality Act (CEQA) and the CEQA Guidelines, public agencies are charged with the duty to avoid or substantially lessen significant environmental effects, with consideration of other conditions, including economic, social, technological, legal, and other benefits. This EIR is an informational document, the purpose of which is to identify the potentially significant effects of the proposed project on the environment and to indicate the manner in which those significant effects can be avoided or mitigated to a level below significance, and to identify feasible alternatives to the proposed project that would avoid or substantially lessen any significant adverse environmental effects associated with the proposed project.

1.1 BACKGROUND

In 1860, John B. Frisbie chartered a ship to export wheat grown in the Vallejo area to England. This was the first time wheat was shipped overseas from California. Within a decade, to capitalize on this new venture and grow Vallejo as a major California export hub, the first flour mill was built at the port in South Vallejo to facilitate the movement of flour into trains and ships. This facility later became the Starr & Company flour mill and was acquired by the G.W. McNear Company in 1895. In 1906, Sperry Mills took over, and in 1929 the Sperry Flour Company became one of the subsidiaries of the General Mills Corporation. Despite a large fire in 1934, which required replacement of the old bulkhouse, General Mills operated the plant on the subject site until its closure in 2004. The site has since remained vacant and is thus available for this potential repurposing.

The project site contains the former General Mills deep-water terminal and those remaining buildings associated with the former General Mills plant. The remaining General Mills structures on the project site include an administration building, garage, warehouse, bakery bulkhouse, manager's house and garage, barn, flour mill, old bulkhouse, new bulkhouse, welding shop, pipe storage area, forklift repair area, dock remnants, and grain silos.

The site is just over 39 acres and is located at 790 and 800 Derr Avenue in the southwestern portion of the City, fronting the Mare Island Strait (see Figures 1-1 and 1-2). VMT owns the majority of project site and has a long-term lease with the City of Vallejo for the remainder of the site (APN 0061-160-230). The current proposal includes Orcem leasing a 4.83-acre portion of the site for its proposed operations, while VMT would operate on the remaining 34.3 acres (Figure 1-3). A portion of the project site is located outside the City of Vallejo limits and is proposed to be annexed into the City as part of the project.

1.1.1 The VMT Component of the Project

The VMT component of the project would reestablish industrial uses on a portion of the 34.3 acres designated as the VMT Site (a portion of the combined 39.1-acre project site) located at 790 and 800 Derr Avenue. The VMT component of the project would involve the removal of a deteriorated timber wharf and construction of a modern deep-water terminal, including wharf improvements, laydown area, and trucking and rail connections, primarily servicing the import and export of bulk and break-bulk commodities within approximately 10.5 acres referred to as the VMT Terminal Site.

1.1.2 The Orcem Component of the Project

The Orcem component of the project would involve construction and operation of an industrial facility for the production of cement material primarily from recycled materials with significantly less polluting air emissions than the traditional portland cement material used in most California construction projects. This cement is technically known as ground granulated blast furnace slag. The Orcem component of the project would involve construction of approximately 73,000 square feet of buildings and equipment, together with outdoor storage areas. Orcem would import most of the raw materials used in the proposed plant via the proposed wharf on the adjoining VMT Site.

1.2 PROJECT PURPOSE AND NEED

The proposed project would reestablish and make efficient industrial reuse of the centrally located marine industrial property, thereby taking advantage of existing truck, rail, and deep-water berth access for import of raw materials, distribution of finished products, and transshipment of regional goods. The proposed project would also provide management and skilled labor employment opportunities for local and regional residents, and provide the City tax revenue.

1.3 PURPOSE OF THE EIR

An EIR is intended to implement the basic purposes of CEQA and provide decision makers and the public with the information required by the CEQA statutes and Guidelines to fulfill these objectives. According to Section 15002(a) of the CEQA Guidelines, the purposes of CEQA are to:

1. Inform governmental decision makers and the public about the potential, significant environmental effects of proposed activities;

2. Identify the ways that environmental damage can be avoided or significantly reduced;
3. Prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible; and
4. Disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved.

1.4 INTENDED USES OF THE EIR

This EIR has been prepared in accordance with applicable federal and state environmental regulations, policies, and laws to inform federal, state, and local decision makers regarding the potential environmental impacts of the proposed project. This Draft EIR is being provided to the public for review and comment. After public review and comment, a Final EIR will be prepared to include responses to written comments on the Draft EIR received from agencies, organizations, and individuals. The Final EIR will be distributed to the following agencies to provide the basis for decision making:

- Solano County
- San Francisco Bay Conservation and Development Commission (BCDC)
- San Francisco Regional Water Quality Control Board (RWQCB)
- Bay Area Air Quality Management District (BAAQMD)
- California State Historic Preservation Office
- U.S. Environmental Protection Agency (EPA)
- California Department of Transportation (Caltrans)
- U.S. Army Corps of Engineers (USACE), San Francisco District
- U.S. Fish & Wildlife Service (USFWS)
- California State Lands Commission
- California Department of Fish and Wildlife (CDFW)

1.5 SCOPE OF THE EIR

This EIR has been prepared in compliance with CEQA (California Public Resources Code Section 21000 et seq.) and the procedures for implementation of CEQA set forth in the CEQA Guidelines (14 CCR 15000 et seq.).

According to CEQA Guidelines Section 15161, an EIR should focus primarily on the changes in the environment that would result from developing the proposed project. This EIR evaluates the potential environmental impacts that may occur from construction and operation of the proposed project, including direct, indirect, cumulative, and growth-inducing impacts. The general areas of environmental impact to be addressed in this EIR were identified in the environmental considerations section of the Notice of Preparation (NOP) issued for this EIR by the City. The comments received in response to the NOP were used to assist the City in determining the scope of this EIR. Chapter 3 of this EIR includes a separate section for each of the following issue areas:

- Aesthetics
- Air Quality
- Biological Resources
- Cultural Resources
- Geology and Soils
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Noise
- Public Services and Recreation
- Transportation and Traffic
- Utilities and Service Systems

In addition, the preliminary environmental review of the proposed project identified a number of environmental issue areas where no significant impacts are anticipated as a result of implementing the proposed project, including agriculture and forestry resources, mineral resources, and population and housing. The proposed project’s less-than-significant effects with respect to these issue areas are described in Section 5.1, Effects Found Not to be Significant, of this EIR and are not discussed in further detail (CEQA Guidelines Section 15128).

1.6 CEQA PROCESS

1.6.1 Notice of Preparation and Responses

To initiate the EIR process, the City circulated an NOP to solicit agency and public comments on the scope of the environmental analysis to be included in the EIR. The 30-day public review period for the NOP began on May 20, 2014, and ended on June 19, 2014. The NOP was mailed and emailed to various federal, state, and local agencies, environmental groups, other organizations, and other interested individuals and groups. The NOP was also published in the *Vallejo Times-Herald* on May 20, 2014.

A public scoping meeting was held by the City on Thursday, May 29, 2014. The purpose of this meeting was to provide the public and governmental agencies with information on the proposed project and the CEQA process, and to give attendees an opportunity to identify environmental issues that should be considered in the EIR. Attendees were invited to mail or email their comment letters to the City during the 30-day NOP public review period by no later than 5:00 p.m. on June 19, 2014.

A total of six letters and emails were received during the NOP public review period. Additional comments were received on the City's Next Door website during this period. Copies of the NOP and the NOP comment letters received by the City are included in Appendix A to this EIR. The following is a list of those respondents who submitted written comments in response to the NOP within the 30-day comment period:

1. San Francisco Bay Ferry – Vallejo – Email dated June 19, 2014
2. California Department of Fish and Wildlife (CDFW) – Letter dated June 17, 2014
3. California Department of Transportation (Caltrans) – Letter dated June 18, 2014
4. Vallejo Sanitation and Flood Control District – Letter dated June 12, 2014
5. Peter Brooks – Email dated June 17, 2014
6. Isaac Rio-Aguilar – Email dated June 3, 2014
7. Combined responses from Next Door website

Comments received in response to the NOP were used to determine the scope of this Draft EIR. The following issues were raised in the written responses to the NOP:

- Impacts to ferry services during construction and operation
- Need for a complete project description
- Direct and indirect impacts to biological resources, including special-status species

- Terminology used to describe the product proposed to be manufactured on the site
- Impacts to the existing sanitary sewer lines within the project site
- Impacts to air quality
- Potential for hazards and hazardous emissions
- Increase in traffic on nearby roads and streets
- Impacts on water quality

1.6.2 Lead and Responsible Agencies

CEQA Guidelines Section 15367 defines a lead agency as any public agency that has the principal responsibility for carrying out or approving a project. The City is the lead agency for the proposed project. CEQA specifies that a lead agency is required to consider the information in the EIR, along with any other relevant information, in making its decisions on a project. CEQA requires the lead agency to consider the information in the EIR prior to the project's approval and to make findings regarding each significant impact identified in the EIR. The EIR aids the lead agency in the decision-making process, but does not determine the ultimate decision that would be made regarding approval of the project. The City is governed by the mayor and a six-member city council. The city council has the principal responsibility for approving City projects.

Under CEQA, state and local agencies, other than the lead agency, that have discretionary authority over a project or aspects of a project are considered responsible agencies. Responsible agencies may use the information contained in this EIR when considering issuance or authorization of permits for the proposed project. Responsible agencies which would use this EIR in their consideration of various permits or other discretionary approvals of the proposed project may include the following:

- BAAQMD
- CDFW
- Caltrans
- California State Historic Preservation Office
- National Oceanic and Atmospheric Administration Marine Fisheries Service (NOAA Fisheries)
- BCDC
- San Francisco Bay RWQCB
- Solano County

- Solano County Local Agency Formation Commission (LAFCO)
- EPA
- USFWS
- USACE, San Francisco District

1.6.3 Draft EIR Public Review

The Draft EIR is subject to a minimum 45-day public review period by responsible agencies and interested parties. In accordance with Section 15087 of the CEQA Guidelines, the City would publish a notice of availability of the Draft EIR at the same time it sends out a notice of completion to the California Office of Planning and Research. Agency and public comments on the adequacy of the Draft EIR and the lead agency's compliance with CEQA may be submitted to the City as lead agency, in writing, prior to the end of the public review period. Following the public review period, the City would prepare a Final EIR, which would include responses to all written comments received during the Draft EIR public review period. The City Council would review and consider the Final EIR before making a decision whether or not to approve the proposed project.

1.7 DOCUMENT ORGANIZATION

This EIR is organized to provide a comprehensive analysis of the significant potential environmental impacts, mitigation measures, and alternatives for the proposed project as follows:

- **Executive Summary.** Summarizes the proposed project, environmental impacts that would result from implementation of the proposed project, recommended mitigation measures that would avoid or reduce impacts, and the level of significance of impacts both before and after mitigation.
- **Chapter 1, Introduction.** Provides an introduction and overview describing the purpose and intended use of the EIR, the EIR's compliance with CEQA, and the scope and organizational format of the EIR. This section also provides background on the proposed project. The environmental setting is also included in this chapter and provides a description of the physical environmental conditions in the vicinity of the proposed project, as they existed at the time the NOP was published, which constitute the baseline physical conditions by which the significance of potential impacts would be assessed. This section also includes a list of discretionary actions that would be required by the lead agency and responsible agencies for the proposed project.
- **Chapter 2, Project Description.** Provides a detailed description of the proposed project, including its geographical setting, major objectives, components, and construction.

- **Chapter 3, Environmental Analysis.** Provides an analysis of the environmental impacts and mitigation measures for the proposed project.
- **Chapter 4, Cumulative Impacts.** Contains an analysis of whether the proposed project, in conjunction with related past, present, and probable future projects, would contribute to the degradation of the environment, in accordance with the guidance found in Section 15130 of the CEQA Guidelines.
- **Chapter 5, Other CEQA Considerations.** Provides discussions required by Sections 15126 and 15128 of the CEQA Guidelines, including effects found not to be significant during the EIR process, growth-inducing impacts of the proposed project, significant environmental effects that cannot be avoided if the proposed project is implemented, and significant irreversible environmental changes that would result from implementation of the proposed project.
- **Chapter 6, Alternatives.** Describes alternatives to the proposed project that would avoid or substantially lessen significant effects and evaluates their environmental effects in comparison to the proposed project.
- **Chapter 7, References (including agencies, organizations, and persons consulted).** Provides a list of the reference materials used in preparing the EIR, including documents that are incorporated by reference in the EIR pursuant to CEQA Guidelines Section 15150. This section also provides a list of the federal, state, and local agencies, other organizations and private individuals contacted in the preparation of the EIR.
- **Chapter 8, List of Preparers.** Provides a list of the EIR preparers.

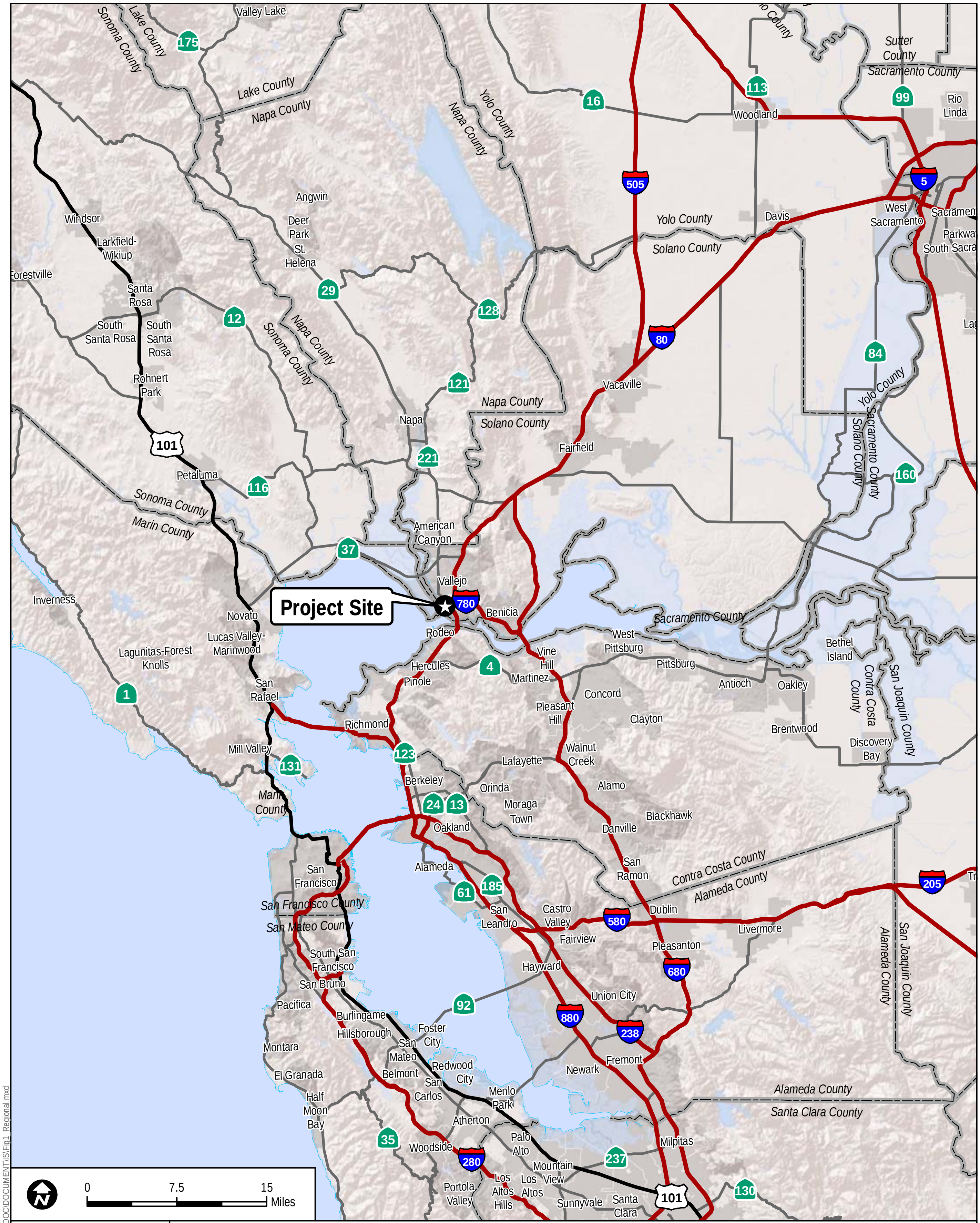

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FIGURE 1-1
Regional Map

VALLEJO MARINE TERMINAL AND ORCEM PROJECT DRAFT EIR

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SOURCE: USGS 7.5-Minute Series Benicia Quadrangle

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FIGURE 1-2

Vicinity Map

VALLEJO MARINE TERMINAL AND ORCEM PROJECT DRAFT EIR

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SOURCE: ESRI 2013

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FIGURE 1-3

Aerial View of Project Site

VALLEJO MARINE TERMINAL AND ORCEM PROJECT DRAFT EIR

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CHAPTER 2
PROJECT DESCRIPTION

2.1 PROJECT LOCATION

The site of the proposed Vallejo Marine Terminal LLC (VMT) and Orcem California Inc. (Orcem) project occupies a total of 39.1-acres located at 790 and 800 Derr Avenue in the southwestern portion of the City of Vallejo, California, fronting the Mare Island Strait (see Figures 1-1 and 1-2). These projects are being analyzed as a single project (proposed project). The combined project site is regionally accessible to vehicular traffic from Interstate Highways 80 (I-80) and 780 (I-780) via State Highway 29 (SR-29 or Sonoma Boulevard), Curtola Parkway and Lemon Street, to Derr Avenue. It is also accessible for rail transportation via the California Northern Railroad rail line network that extends along the Vallejo waterfront, as well as for shipping transportation via the adjoining deep-water terminal that will be redeveloped as part of the VMT component of the project (see Figure 1-2).

2.2 EXISTING PROJECT SITE

VMT owns a majority of the 39.1-acre project site and has a long-term lease with the City of Vallejo (City) for the remainder of the site (APN 0061-160-230). Orcem would lease a 4.83-acre portion of the site for its proposed operations, while VMT would operate on the remaining 34.3 acres (Figure 1-3). VMT could potentially lease additional portions of the site to other operations in the future, which may require subsequent environmental review. The project site is currently secured by a fence which extends around nearly the entire land portion of the VMT Site.

The project site contains the former General Mills deep-water terminal and buildings associated with the former General Mills flour milling plant. The General Mills plant closed in 2004, and the project site has since remained vacant. Table 2-1 identifies the former General Mills buildings and equipment located on the project site, together with their approximate sizes and year of construction. The existing structures listed in Table 2-1 and shown on Figure 2-1 vary in height from one to eight stories, and in footprint size from approximately 300 to 42,500 square feet, comprising a total of approximately 211,460 square feet of floor area.

All of the existing structures on the project site are listed in Table 2-1. As proposed, the following structures would be demolished with implementation of the combined proposed project: (a) structures 1 through 7, located on the Orcem Site and (b) structures 11, 12, and 16 on the VMT Site. Building 11 on the VMT Site would continue to be used for related warehouse and office purposes until such time as it is demolished. Buildings 9, 10, and 13–15 would be used for office and administrative purposes as part of the VMT component of the project. Structure 8 was removed from the project site in 2012.

Table 2-1
Existing General Mills Structures

Figure Reference	Structure	Type	Footprint (square feet)	Floor Area (square feet)	Year Built	Impacted by Project?
1	Grain Silos and Elevator	Equipment	17,700	17,700	1917	Yes (Orcem)
2	Flour Mill	Building	35,000	134,000	1917	Yes (Orcem)
3	Old Bulkhouse	Building	1,200	1,200	1957	Yes (Orcem)
4	New Bulkhouse	Building	1,100	1,100	1985	Yes (Orcem)
5	Welding Shop	Building	400	400	1985	Yes (Orcem)
6	Pipe Storage	Building	600	600	1985	Yes (Orcem)
7	Forklift Repair	Building	300	300	1985	Yes (Orcem)
8	Mill Run Canopy (structure removed in 2012)	Building	0	0	1986	No
9	Administrative Building	Building	2,100	4,200	1917	No
10	Garage	Building	1,910	1,910	1918	No
11	Warehouse	Building	42,500	42,500	1947	Yes (VMT)
12	Bakery Bulkhouse	Building	4,700	4,700	1992	Yes (VMT)
13	Manager's House	Building	985	1,970	1901–1919	No
14	Manager's Garage	Building	380	380	1950's	No
15	Barn	Building	500	500	1901–1919	No
16	Dock (Wharf)	Structure	0	0	1901–1919	Yes (VMT)
	TOTALS		**109,375**	**211,460**		

The entire project site is located within the City's Planning Area, as shown in the Vallejo General Plan, which is defined as lands within the City limits and lands outside the City limits but within the City's sphere of influence. Five and a quarter (5.25) acres of the site are located in the unincorporated area of Solano County but within the City's sphere of influence (see Figure 2-2). The portion of the project site within the City limits is designated "Employment" in the City's General Plan, and the zoning designation is "Intensive Use (IU)." The portion of the project site located outside the City limits is designated "Open Space-Community Park" in the City's General Plan and does not have a City zoning designation (City of Vallejo 1999 and City of Vallejo 2015), although it has historically been a part of, and portions used for industrial purposes within, the General Mills flour milling facility. The 5.25-acre portion of the site that is outside the City's boundaries is designated "Park and Recreation" in the Solano County General Plan (County of Solano 2008), and the zoning designations are RTC-6 (Residential Traditional Community 6,000 square feet) and CR (Commercial Recreation) (County of Solano 2014).

The Intensive Use zoning district, as described in Chapter 16 of the Vallejo Municipal Code (VMC), is Vallejo's heaviest industrial district. The regulations for this district distinguish between "Permitted Uses" and "Permitted Uses Subject to A Major Use Permit." As detailed in Chapter 16.34 of the Zoning Code, "General Industrial Uses" are "Permitted Uses" (Section

16.34.020.C.2), whereas "Heavy Industrial Uses" are permitted upon the issuance of a major use permit (Section 16.34.040.B.1) which requires Planning Commission review. VMC Section 16.06.530 (Article V) distinguishes between "General" and "Heavy" industrial uses. It classifies "General Industrial Uses" as consisting of "industrial plants engaged in manufacturing, compounding, processing, assembling, packaging, treatment or fabrication of materials and products." It classifies "Heavy Industrial Uses" as "all other plants" or any such plant which "involves the compounding of radioactive materials, petroleum refining or manufacturing of explosives." The proposed project is considered a heavy industrial use and therefore requires a major use permit.

A substantial portion of the project site was originally held by the State of California and was granted to the City of Vallejo as trustee subject to the Public Trust Doctrine. This portion of the site, in common with other tidelands areas throughout the State of California, must serve statewide public purposes in addition to local public purposes. Allowable uses include maritime-related commerce, industry, fisheries, and navigation; environmental preservation; and recreation. Non-maritime-oriented commercial or industrial uses, as well as residential uses, are generally not permitted on public trust lands.

The project site is bounded by the Mare Island Strait to the west, a steep hillside to the east, rail lines and existing industrial uses to the north, and undeveloped areas to the south. Residential uses are located east and southeast from the site. The residential uses include the Bay Village Townhouses to the southeast, Harbor Park Apartments and single-family residences to the northeast, and single-family residences to the south along the water front (the Sandy Beach community) which is within the unincorporated area of Solano County just outside the City boundary. The nearest school to the site is Grace Patterson Elementary, located approximately 0.3 mile southeast of the site.

2.3 PROJECT OBJECTIVES

The City and the applicants have identified the following objectives for the proposed project:

- Establishment of the VMT Terminal as a key site of multi-modal and intermodal transportation and logistics, thereby enhancing Vallejo's role in the regional and international trade economy and providing a means for locally manufactured products to be transported and distributed, increasing the viability of and the potential for attracting further manufacturing operations to Vallejo.
- Maximize the potential for the manufacture of ground granulated blast furnace slag (GGBFS), a product that helps to meet the needs of the construction industry for high-performance, environmentally favorable concrete and sustainable building materials, by

providing for an efficient scale of production at a plant which would operate around the clock as a multi-modal receiving, storage, processing, and distribution facility.

- To provide management and skilled labor employment opportunities for local and regional residents in the construction phases, as well as the long-term operations of commercial and industrial uses on the project site.
- To generate various tax revenues including property taxes and assessments, possessory interest tax, and utility user fees.
- To reestablish and optimize the industrial use of this centrally located marine industrial property through removal of those remaining components of the severely damaged timber wharf and construction of a modern deep-water terminal.
- To maximize accommodations for shipping and receiving of a wide range of products through the VMT Terminal, including loading and unloading of vessels of up to 70,000 metric tons in size with draft of up to 38 feet through the Phase 1 Wharf, along with a combination of barge and other smaller vessels through the Phase 2 rock dike. The improvements would help to further develop Vallejo's capabilities for water-based shipping in connection with the Port of Oakland.
- To maximize throughput capacity through the implementation of intermodal upgrades designed to optimize cargo handling operations as well as modern design initiatives enabling the most efficient use of the ground area and taking advantage of existing truck, rail, and shipping access for import and export of raw materials and finished products.
- To establish the VMT Terminal as a key site of multi-modal and intermodal transportation and logistics, thereby enhancing Vallejo's role in the regional and international trade economy.
- To provide a means for locally manufactured products to be transported and distributed, increasing the viability of and the potential for attracting further manufacturing operations to Vallejo (in addition to Orcem).
- To establish an around-the-clock multi-modal receiving, storage, processing, and distribution facility that would maximize the potential for the manufacture of GGBFS, a high-performance environmentally preferable concrete and sustainable building materials.
- To reliably provide competitively priced and environmentally preferable cement products and offer GGBFS and non-GGBFS cementing products, in order to provide a complete line of competitive products that meet long-term client and project needs, and to have the ability to respond to potential worldwide shortages of GGBFS supplies, thereby assuring sustainability of Orcem's operation over time.

- To follow the federal Short Sea Shipping Highway Initiative where possible by focusing on short sea shipping opportunities that move cargo by coastal and inland waterway barges, reducing both truck and rail environmental impacts.

2.4 PROPOSED PROJECT

This Environmental Impact Report (EIR) refers to the VMT and Orcem Project as the “proposed project” due to the shared site and the operating characteristics of the site. The Orcem component of the project would be sited on a portion of the VMT property and is highly dependent on VMT for transporting raw materials, and the VMT component of the project would be dependent on Orcem for a certain percentage of its business. However, to effectively analyze impacts from the two operations, it is also important to explain and further discuss the two components of the projects separately.

The VMT component of the project would reestablish industrial uses on a portion of the 34.3 acres designated as the VMT Site (a portion of the combined 39.1-acre project site) located at 800 Derr Avenue. The VMT component would involve the removal of a deteriorated timber wharf and construction of a modern deep-water terminal, including wharf improvements, laydown area, and trucking and rail connections, primarily servicing the import and export of bulk and break-bulk commodities within approximately 10.5 acres referred to as the VMT Terminal Site. Construction of the terminal would require fill and dredging activities in the water. The VMT component would be constructed in two phases over a period of time. As shown in the Project Phasing Diagram (Figure 2-3), some construction elements, such as demolition of the former General Mills Warehouse Building and connected Bakery Bulkhouse, and construction of rail improvements are tied to market demand and may therefore take place following completion of the initial Phase 1 VMT improvements. These elements would be completed prior to completion of the VMT Phase 2 rock dike. In addition to the construction and operation of this modern terminal, the VMT component would also reuse several of the existing buildings formerly occupied by General Mills. Buildings and structures to remain would be used by VMT for administrative office and commercial office uses consistent with the City’s Intensive Use zoning district standards.

As an operational deep draft facility (allowing vessels with a vertical distance between the waterline and the bottom of the ship of approximately 38 feet), the VMT Terminal is anticipated to handle a wide range of commodities including the following:

- Feed grains
- Manufactured steel
- Timber/lumber

- Rock, aggregate, ores, and related materials (including granulated blast furnace slag (GBFS), portland cement clinker material (clinker) and related materials)
- Project-based break-bulk items (i.e., heavy lift transport, large construction assemblies)
- Marine construction materials
- Gypsum

Remaining portions of the severely damaged and decayed wharf structure would be removed as part of the VMT component of the project because the structure is not physically suitable or economically feasible for reuse or repair. The remnants of the old wooden wharf which have undergone repair, replacement, and partial removal over the years have experienced substantial decay over the past century and in the last decade in particular. The new deep-water terminal would be constructed at this location. The wharf would include a concrete pile-supported structural concrete deck, associated mooring and fender systems for docking vessels, and related improvements for deep-water marine transportation operations.

The Orcem component of the project would involve construction and operation of an industrial facility for the production of a high performance, less polluting alternative for the traditional portland cement material used in most California construction projects. The production of GGBFS is considered to be less polluting than the production of portland cement because it is produced using a by-product of steel manufacturing (GBFS). The Orcem component would involve construction of approximately 73,000 square feet of buildings, equipment, and enclosures, together with outdoor storage areas, on a 4.83-acre portion of the former General Mills plant site leased from VMT. Eight of the buildings and equipment previously used by General Mills within the Orcem Site would be demolished in order to accommodate construction and operation of the proposed GGBFS cement products production facility. The Orcem component would be constructed in phases to coincide with the growth in demand for Orcem's products. Orcem would import most of the raw materials used in the proposed plant via the proposed Phase 1 wharf on the adjoining VMT Site. As discussed earlier in Section 2.2, the Orcem component of the project would operate as a General Industrial Use because it does not involve use of radioactive materials, petroleum refining, or the manufacture of explosives, and would not result in high levels of sewage discharge. The proposed Orcem Plant adjoins residential land uses to the east and southeast. However, all equipment and operational areas on the Orcem Site would be located more than 300 feet from the nearest residential zoning district boundary. The Orcem component of the project is proposed to operate on a 24-hour basis.

2.4.1 Construction

2.4.1.1 VMT Construction

Phase 1

Phase 1 construction would begin with removing the remnants of the existing wharf and construction of a new wharf, including the installation of approximately eighty-one (81) 24-inch octagonal precast concrete piles and eight (8) 30-inch steel pipe piles which would be driven down to the underlying bedrock layer. The proposed design, shown in Figure 2-4, is a reinforced concrete wharf, comprised of structural concrete caps along pile rows, and a structural concrete deck extending 500 wall-feet along approximately the same line as the existing wharf, with an approximate width of 29 feet. The top elevation of the completed concrete deck would be approximately 11.5 feet above mean lower low water (MLLW).

The remaining elements of the severely damaged timber structure would be removed to accommodate installation of the concrete piles and wharf improvements. Some riprap (rock slope protection) would be required along the land interface of the wharf as well as the slope beneath the wharf as shown in Figure 2-4. Additionally, riprap and engineered fill would be placed shoreward of the eastern edge of the wharf in order to "square out" the land–wharf interface. Phase 1 would require approximately 50,453 square feet of solid fill (approximately 10,300 cubic yards), both engineered fill and riprap as slope protection, to the mean high water line. Additional grading fill, which occurs within the 100-foot Bay Conservation and Development Commission (BCDC) shoreline band, of approximately 100,452 square feet (approximately 10,900 cubic yards) would be needed to bring the laydown area, which would be located directly east of the wharf, to a finished grade of 11.5 feet above MLLW. The laydown area would be used for temporarily storing materials on site. Most of the fill would be placed within the footprint of the existing wharf and shoreward above the mean high water line for site-grading purposes. It is anticipated that the engineered fill would partially consist of on-site recycled concrete made available through the demolition and processing of obsolete structures.

The eight steel pipe mooring piles, 30 inches in diameter, would be driven within the footprint of the existing wharf and along the shoreline to establish mooring points for vessels. On the water side of the wharf, the channel would be dredged to a depth of 38.0 feet below MLLW (approximately 89,800 cubic yards, subject to a permit from the U.S. Army Corps of Engineers (USACE) to accommodate deep draft vessels and barges typically engaged in carrying bulk and break-bulk cargoes, as shown in Figure 2-5. This depth would subsequently be maintained through a USACE Section 10 Maintenance Permit. Beneficial reuse of dredge material would be sought through possible sale or upland disposal on site, or would be deposited at the Carquinez disposal site, following the guidelines of the San Francisco Bay Long-Term Management

Strategy for Dredging. The need for and frequency of future maintenance dredging at the VMT terminal would vary depending on the level of naturally occurring scouring within the Mare Island Strait. Additionally, movements of vessels into and out of the terminal should also naturally displace some sediment build-up. Excluding any emergency dredging needs, which would be allowed under an emergency permit, VMT assumes that maintenance dredging may occur on average for 5 days every 4 years.

In addition to the wharf construction, Phase 1 improvements would include installation of a 6,000-square-foot steel maintenance shed, approximately 50 feet wide by 120 feet long, toward the southern end of the site, shown in Figure 2-6. VMT is also proposing to install landscape materials to screen the view of the maintenance shed from residences to the south of the project site. Phase 1 improvements would also include internal roadway improvements, rail improvements, and utility improvements.

The existing Warehouse Building (No. 11 in Figure 2-1) and Bakery Bulkhouse (No. 12 in Figure 2-1) would be demolished in order to accommodate rail access and an area for transferring (transloading) goods and materials to or from rail cars, and to establish efficient terminal logistics.

The on-site construction duration of Phase 1 is expected to be 4–6 months, with an anticipated start date of early to mid-2016, subject to project approval and permit conditions. Rail improvements are driven by market demands, and would occur following completion of the initial Phase 1 improvements, but prior to the completion of the Phase 2 dike as described in the following section.

Phase 2

Phase 2 would involve the construction of a rock dike that would be used to create a location for barges to dock. The rock dike would have a length of approximately 600 wall-feet, running in a northerly direction from the northern edge of the Phase 1 wharf to the shoreline as shown in Figure 2-6. The Phase 2 rock dike would have a finished elevation of approximately 11.5 feet above MLLW. The Phase 2 rock dike improvements would be situated immediately north of and connect diagonally between the Phase 1 wharf and a point on the shore directly opposite the northwest corner of the old Warehouse Building. The rock dike would be installed utilizing a riprap dike with fill placed between the dike and existing shoreline, as shown in Figure 2-7. Twelve (12) 36-inch steel pipe mooring piles would be driven at 50-foot intervals along the face of the Phase 2 rock dike. Phase 2 would require approximately 106,040 square feet of solid fill (approximately 15,800 cubic yards) both engineered fill and riprap as slope protection, to the mean high water line. Additional grading fill, which occurs within the 100-foot Bay Conservation and Development Commission (BCDC) shoreline band, of approximately 31,561 square feet (approximately 19,580 cubic yards) would be needed to bring the laydown area to a finished grade of 11.5 feet above MLLW. The solid fill areas created for Phase 2 would be used as a laydown area for dry bulk and break-bulk cargoes. In order to backfill this area, engineered fill, including the beneficial reuse of dredged material mixed with Class 2 aggregate processed from on-site building demolition, would be placed behind the rock dike and allowed to dry over time. It is anticipated that drying time for the soil placed behind the rock dike would require approximately 14 months prior to use.

Dredging of approximately 46,500 cubic yards would also be required, as shown in Figure 2-8, pursuant to a USACE permit, as part of Phase 2 to establish a berthing depth of 25 feet to 38 feet below MLLW.

The on-site construction duration for Phase 2 would be approximately 12 months, with an estimated start date of January 2017. During the construction of each phase, there would be approximately 20 persons working on the site and onboard various construction barges and tugs. Materials would be delivered to and shipped from the completed Phase 1 and 2 Terminal Site by various means including barges, ships, trucks, and rail cars. The VMT Phase 2 improvements would be constructed after the Orcem Phase 1 construction period is complete.

2.4.1.2 Orcem Construction

The Orcem component of the project would consist of the following primary construction components: (1) site preparation, including demolition of the seven remaining structures formerly utilized by General Mills situated within the Orcem Site (to be performed by VMT); (2) development of the enclosed milling plant, including major buildings, storage facilities, conveyance systems and processing equipment; (3) construction of ancillary buildings (see Table 2-2 for complete list); and (4) improvement of site infrastructure and supporting facilities, including fire hydrants, stormwater management improvements, and equipment for loading and unloading of rail cars. This work would be commenced concurrently with VMT Phase 1 work as shown in Figure 2-3.

Site Preparation

Demolition of the existing buildings and equipment on the Orcem Site is scheduled to take place as part of the initial construction phase. The proposed project involves demolition of the seven remaining former General Mills structures listed in Table 2-1 and identified by number in Figure 2-1. The Flour Mill (map reference no. 2) and silo/elevator (map reference no. 1) buildings identified in Table 2-1 and Figure 2-1, were designed and built in 1917 by the Sperry Flour Company to accommodate processing and storage of grain products, and are of advanced age, have severe physical deterioration, and are structurally unsuitable for accommodation of the extremely large and heavy equipment and materials used in the milling of Orcem products. The remaining five smaller structures on the Orcem Site were more recently constructed to serve specific support functions for the General Mills plant. Reuse of these buildings would be infeasible and cost prohibitive.

Buildings, Storage Facilities and Equipment

Construction of the new Orcem Plant would include 11 separate buildings and major pieces of equipment, as listed in Table 2-2 and shown on Figure 2-9. These improvements would provide for a total building area of approximately 73,000 square feet, with a total footprint area of approximately 61,070 square feet. In final Phase 2 configuration, the proposed Orcem buildings and equipment would cover 29% of the site.

Table 2-2

Proposed Orcem Buildings, Equipment, and Major Facilities

Figure Reference	Element	Element Type	Footprint (square feet)	Floor Area (square feet)	Height
1	Processing Mill	Building	5,700	10,200	97' 5"
2	Filter	Building	3,350	12,000	97' 5"
3	Main Fan and Base	Equipment	960	N/A	Varies
4	Workshop and Control	Building	1,950	3,900	38' 0"
5	Two-Story Office	Building	1,450	2,600	23' 5"
6	Outload Silos and Weighbridges	Building	4,400	5,800	62' 8"
7	Storage Silos (3) and Elevator	Building	5,260	N/A	131' 6"
8	Raw Material Storage	Building	38,000	38,000	82' 7"
9	Raw Material Storage Area	Open Area	N/A	N/A	N/A
10	Mill Hopper, Silo, and Conveyor	Equipment	N/A	N/A	Varies
11	Conveyor to VMT Terminal	Equipment	N/A	N/A	Varies
TOTALS			**61,070**	**72,500**	

The buildings and major facilities presented in Table 2-2 and shown on Figure 2-9 are further described below:

- **No. 1 – No. 3:** The processing plant would consist of the enclosed Processing Mill building (no. 1), the connected Filter Building (no. 2) (which would contain the mill intake, hot air gas generator, and miscellaneous ancillary equipment), the vent stack, and the main fan and base (no. 3).
- **No. 4 Workshop and Control Room Building:** This building would include: (1) the central plant control office, locker room, breakroom, toilets, showers, and related facilities on the second floor; and (2) the light maintenance workshop area and a bathroom on the ground floor.

- **No. 5 Office Building:** This would be a two-story administrative and laboratory office building.
- **No. 6 and No. 7:** The finished product facilities would include two elevators, up to three fully sealed Storage Silos for finished products, the Outload Building with its three Outload Silos and Weighbridges, and the Airslide which would convey the finished product from the Processing Mill and Filter Building to the Storage Silos. The Outload Building would be designed to accommodate enclosed truck loading and weighing for the dispatch of the finished products to market.
- **No. 8 Raw Material Storage Building:** A covered storage area for dry bulk materials requiring covered storage, e.g., portland cement clinker material ("clinker").
- **No. 9 Raw Material Storage Areas:** The open areas immediately south and east of the Raw Material Storage Building designated for storage of: (a) GBFS material along the easterly side of the Orcem Site; and (b) gypsum, pozzolan rock, and limestone materials within the southern end of the Orcem Site.
- **No. 10 Mill Hopper, Silo, and Conveyor:** A covered belt conveyor system to transport the raw materials from the Raw Material Storage Areas to the processing plant. This system would include the Mill Feed Hopper, the Raw Material Silo and Elevator, an additional material silo, and the conveyor leading to the Processing Mill and Filter Building.
- **No. 11 Conveyor from VMT Terminal:** The conveyor systems and intake hopper/extractor to be installed within an easement created over a portion of the VMT Site to facilitate the movement of raw materials between the terminal and Orcem Site as part of the Phase 1 and 2 operations.

2.4.2 Operation

2.4.2.1 VMT Operation

The VMT component of the project would primarily service dry bulk and break-bulk cargoes. Liquid bulk cargoes or large-scale container operations are not envisioned as part of the VMT Terminal. While the primary focus of VMT operations would be aggregates, the terminal would be designed to include both shipping and receiving a wide range of products through the Phase 1 and Phase 2 facilities, including loading and unloading of vessels through the Phase 1 wharf, along with a combination of barge and other smaller vessels through the Phase 2 dike.

The following information reflects potential maximum use estimates associated with full implementation of VMT Phases 1 and 2 and associated uses. Actual operational volumes may vary.

Movement of Materials

Shipping Facilities

Phase 1: The overall volume of cargo handled through Phase 1 would be expected to increase over the first several years of operation in response to market demand. Prior to completion of the rail access, cargos offloaded from vessels would be loaded exclusively onto trucks, which would limit the overall capacity of the terminal due to space limitations. The capacity of the terminal to handle larger volumes of cargo would expand with completion of the rail access and transloading area improvements identified. For the purposes of analysis, this EIR considers VMT Phase 1 to include the rail improvements, which would maximize the capacity of the terminal to allow for up to a total of four vessels per month and a maximum average monthly cargo of 160,000 metric tons (this volume includes 40,000 metric tons of material associated with Orcem Phase 1, and approximately 63,400 metric tons of material associated with Orcem Phase 2). This volume assumes a 5 to 6 day loading or unloading time per vessel. Vessels would be moored at the wharf on average from 5 to 7 days. During the time that vessels are moored at the facility, 24-hour operations would be conducted for offloading or loading of cargo. Other VMT Terminal operations would be scheduled as two 10-hour shifts per day, six days per week. Note that both Orcem's Phase 1 and Phase 2 operations can occur with the construction of VMT's Phase 1 improvements. Therefore, the volumes of materials processed through the VMT Phase 1 Terminal would increase as Orcem operations move from Phase 1 to Phase 2. Table 2-3 reflects combined VMT and Orcem volumes.

Phase 2: The Phase 2 dike is designed to follow the federal Short Sea Shipping Highway Initiative by focusing on short sea shipping opportunities that move more cargo by coastal and inland waterway barges, reducing the environmental impacts of both truck and rail transportation that may otherwise be used. There is the potential for 24-hour work periods during vessel loading and unloading, and other operations occurring within the same business hours as Phase 1. One of the primary functions of the Phase 2 rock dike and its associated additional laydown area would be the enhanced efficiency of transloading of cargos between various modes of transport, such as from barges to trucks and/or trains, or from larger vessels to barges. The additional necessary laydown area to be provided in Phase 2 (see Figure 2-5) would support the transload process, as an inbound Phase 1 wharf cargo could be moved to the Phase 2 laydown area to be reclaimed and loaded onto barges. Alternatively, an in-bound rail cargo could be similarly transloaded to barges. This would allow the Phase 1 laydown area to be open for the discharge of a new inbound cargo.

As shown in Table 2-3, the completion of the Phase 2 rock dike would provide an expanded land area for operations and would increase the efficiency of the terminal to transload cargo materials.

In addition, completion of Phase 2 would also allow a greater percentage of total cargo processed to utilize barges, thereby potentially reducing dependency on truck and train movements.

Rail Facilities

The proposed rail transloading improvements (including rail realignment) would occur prior to completion of Phase 2 and would accommodate up to 16 rail cars for loading on site at one time. Existing California Northern Railroad track spurs that adjoin the VMT Site's northern entrance would be used to store rail cars during the loading process. The rail spur area can accommodate up to 77 rail cars at one time. VMT anticipates use of two switch-mobiles or a small locomotive to handle rail car movements on the VMT Site and to and from the California Northern Railroad track spurs adjacent to the site. Material handling equipment such as a mobile hopper (loading equipment) connected to a mobile surge-bin (loading device) via an enclosed transfer conveyor would be used along the realigned rail tracks to accommodate loading and unloading rail cars. Additionally, there would be two Caterpillar 988 front-end loaders (or equivalent) and two to three forklifts to handle cargo movements in the laydown areas. A third Caterpillar 988 (or equivalent) would be needed after completion of the Phase 2 construction. Trains would be scheduled to minimize interference along major street routes. The maximum number of anticipated rail cars per day that are associated with the project (including both VMT and Orcem components) are shown in Table 2-3.

Trucking, Circulation, and Access

Trucks would access the VMT Site from Derr Avenue coming from Lemon Street through a mixed commercial and residential area. They would travel to the freeway along SR-29 for southbound I-80 traffic, and along Lemon Street for northbound I-80 and eastbound I-780 traffic. The maximum number of anticipated truck trips per day that are associated with the VMT component of the overall project are shown in Table 2-3.

There would be no public access to the VMT Site which is fenced with a security entrance. Because of international freight movements, this site would be secured and subject to Department of Homeland Security rules requiring all workers, including rail engineers and truck drivers with unescorted access to have a Transportation Worker Identification Credential to access the site at all times. Additionally, the VMT Terminal would be a heavy industrial site with rail car, truck, and heavy equipment operations. Access to the planned commercial and industrial uses proposed for reuse of the existing buildings would be subject to the same security clearance and access control limitations.

Table 2-3
Summary of Maximum Material Volumes and Transport Methods - VMT Phase 1 and Phase 2 Volumes (with Orcem Materials Included)

VMT Phase	Vessels / Month*	Max. Monthly Shipping Cargo (metric tons) (VMT and Orcem)	VMT Trucks/Day	Average Rail Cars/Week (VMT and Orcem)**	Average Unit Trains/ Week	Barge Volume (metric tons/month)**
Phase 1	4	160,000	87	200	2.6 77-car trains	0
Phase 2	7.5	160,000	87	200	2.6 77-car trains	48,000

Notes:

* Phase 1 wharf capacity would be limited to accommodating a monthly maximum of four (4) deep water vessels. If only trucks are used to transport materials from the site, then only two vessels would be accommodated per month – one serving VMT and one serving Orcem. This is due to the limited Phase 1 laydown area and the length of time it would take to unload materials from a vessel and load it onto trucks. If the proposed rail improvements are completed by the railroad and service becomes available, materials would be able to be moved off site more rapidly. This would allow the VMT facility to accommodate up to four vessels per month in Phase 1.

Phase 2 would include up to 4 ships and 3.5 barges; all figures are averages derived from projected annual volumes. The construction and operation of the Phase 2 Terminal would allow an expanded operational area for transloading of materials, and the increased efficiency of loading materials from ships to barges (as opposed to exclusive unloading onto trucks and trains).

** The maximum number of project related rail cars per year is 14,400 and this is based on a maximum of 300 rail cars per week. In general, the number of rail cars in any given month and week will fluctuate based on the type of product that is being transported from the project site to market, but the average number of rail cars per month is anticipated to be 800. It should be noted that if 300 rail cars are moved in one week this equates to four 77 car trains per week. The average number of rail cars and unit trains per week are identified in the table above.

All cargo and transportation figures presented in Table 2-3 are maximums, with the exception that the number of unit trains per week is expressed as an average. Note that the transition from VMT Phase 1 to Phase 2 operations would result in smaller vessels utilizing the newly opened Phase 2 terminal facilities, and the potential for a portion of VMT's total truck and rail volumes to be handled by barges. It is also possible that goods and materials arriving by barges and other smaller vessels would leave the site by truck or rail (resulting in no net reduction in truck and rail volumes between Phase 1 and Phase 2). Concurrently with establishment of Orcem's Phase 2 operations, the percentage of maximum terminal capacity utilized for import of raw materials serving the Orcem Site would increase (as quantified in Table 2-4 later in this discussion). That portion of the maximum remaining terminal capacity available for VMT import and export would therefore decrease with operation of Orcem Phase 2.

Cargos which are not containerized, or do not otherwise release fugitive dust or airborne/soluble toxic materials when handled and stored in the open, would be unloaded using portable equipment onto the paved or aggregate surfaces within the 10.5-acre VMT Terminal shipping and receiving site area. Existing pavement within these areas would be removed where necessary in order to complete finished elevation grading for stormwater management and to establish permeable surfaces where appropriate. All other cargo received or shipped through the VMT Terminal would be handled through enclosed transport devices. The existing surfaces at the site would be used as temporary laydown areas for the cargo being prepared for loading onto vessels or unloaded for transfer to barge, rail, or trucks. Temporary storage structures could be used if all-weather coverage is warranted.

Parking

A paved parking area for employees would be provided adjoining the existing Administrative Building, with a capacity for 40 vehicles, consistent with peak-period employee and visitor estimates. Ample all-weather surfaced space would also be available to accommodate loading/unloading operations and truck and equipment parking within the VMT Site.

Building Usage

The existing 42,500-square-foot Warehouse and adjoining 4,700-square-foot Bakery Bulkhouse (buildings nos. 11 and 12 listed in Table 2-1 and identified in Figure 2-1), may be used initially for VMT Phase 1 support operations; however, these buildings would eventually be demolished as part of Phase 1 in order to accommodate rail access, establish efficient terminal logistics, and provide a more accessible laydown area for barge cargos.

The 4,200-square-foot Administrative Building (building no. 9), and 1,910-square-foot Garage (building no. 10), as identified on Figure 2-1, would initially be used as part of the Phase 1 VMT administrative and operational support, and may later be used to accommodate a variety of complementary terminal operations, warehousing, office, and general manufacturing uses. These future uses may involve independent long-term leases (as in the case of Orcem) with the potential for minor additions.

A small metal-framed equipment storage and maintenance building of approximately 6,000 square feet would be constructed approximately 240 feet south of the Orcem Site at the base of the slope. The internal port access road would be extended south in Phase 1 to allow access to this building by equipment used at the wharf. The area between the maintenance building and the southern Orcem Site boundary may be used to park equipment when not in use at the wharf.

Staffing

During vessel loading/unloading operations, there could be up to a total of 40 individuals working on the VMT Site for Phases 1 and 2. During regular operations, it would be expected that 25 individuals engaged in cargo loading and offloading, site maintenance operations, and administrative duties would be at the facility on a permanent basis. Additionally, there would be truck drivers and rail equipment handlers who would enter and exit the site based on operational needs.

2.4.2.2 Orcem Operation

The primary element of the proposed Orcem component of the project is a processing facility for the production of a high performance "green" cement, produced from a recycled material with an order of magnitude less CO_2e (carbon dioxide equivalent) and other polluting air emissions than the traditional portland cement consumed in California annually (see Appendix C). This green cement is also known in the industry as ground granulated blast furnace slag (GGBFS).

The primary raw material utilized in the manufacture of GGBFS is GBFS, a recycled by-product from the first stage in the production of steel. GBFS would be processed by drying and grinding to produce a very fine powder, to which a small quantity of gypsum/anhydrite would be added, yielding the principal finished product, GGBFS. GGBFS is used in the ready mix and precast concrete industries and in the production of mortars and grouts to improve product performance. GGBFS can be either blended with ordinary portland cement to produce slag-blended cements for sale to concrete producers, or it can be sold alone and then blended with other cement-like materials by concrete manufacturers. GGBFS, as a finely ground powder, is capable of emitting fugitive dust particles if not properly contained within closed processing, storage, and loading facilities. The milling process is accordingly carried out in a closed circuit system under negative pressure (no outlet to the exterior, except through high performance filters).

The Orcem Plant would be capable of operating in three different modes, as follows:

- Mode 1: Import of GBFS and production of GGBFS.
- Mode 2: Import of clinker and production of portland cement.
- Mode 3: Import of GBFS and production of GGBFS, and import of portland cement.

The Orcem Plant would be constructed in two major phases to coincide with the growth in demand for Orcem's products. The total throughput of raw materials of the plant in Phase 1 would be up to 500,000 metric tons per year and in Phase 2 would be up to 900,000 metric tons per year. These phases are further broken down into the following production milestones:

- Milestone 1: Import of 120,000 metric tons of primary raw material per year (Phase 1).
- Milestone 2: Import of 240,000 metric tons of primary raw material per year (Phase 1).
- Milestone 3: Import of 360,000 metric tons of primary raw material per year (Phase 1).
- Milestone 4: Import of 480,000 metric tons of primary raw material per year (Phase 1).
- Milestone 5: Import of 760,000 metric tons of primary raw material per year (Phase 2).

Production Process

The Orcem production process would involve the following key steps (refer to Figures 2-9 and 2-10a, 2-10b, and 2-10c):

1. Transport of Raw Materials to the Site

The Orcem Plant would focus on production of GGBFS as the principal finished product, but would also include production of other hydraulic cement products. The principal raw materials processed in the Orcem Plant for the production of GGBFS would be GBFS and gypsum/anhydrite. Other raw materials used in the production of other cement products include clinker, limestone, and pozzolan. Under full Phase 2 operation, up to 760,000 metric tons of raw materials would be delivered to the Orcem Plant annually via a combination of shipping, rail, or truck, as described below:

Shipping

- *VMT Terminal:* Various sizes of ships (described below), would dock at the reconstructed VMT Terminal, carrying GBFS, gypsum, anhydrite, pozzolan, and/or clinker. The ships would then be unloaded via an enclosed conveyor system directly to the adjoining Orcem Plant storage facilities. Because of its proximity and based on anticipated capacity and availability, the VMT Terminal is the primary and most economically feasible method of material transport to the Orcem Plant on a long-term basis.
    - *Geared Ships* such as a 40,000-metric-ton bulk carrier with onboard cranes (geared ship). This ship would berth at the VMT Terminal, and raw materials would be discharged from the ship using clamshell grabs fitted to the onboard cranes and deposited into mobile hoppers on the dock.
    - *Self-Discharge Ships* such as a 70,000-metric-ton bulk carrier with onboard reclaim conveyors and a discharge boom with an integral belt conveyor (self-discharge ship). This ship would berth at the VMT Terminal and raw materials would be discharged from the ship via the self-discharge boom into a receiving hopper located on the shore.
- *Port of Richmond:* The Port of Richmond, located approximately 17 miles to the south (and alternatively the Port of Stockton located 60 miles to the west), would serve as an alternative short-term emergency source for delivery of GBFS and clinker, via ships from sources in Asia and around the world. The raw materials would be loaded onto trucks at the port, driven to the plant, and offloaded for storage. This method would only be used in the event that the VMT Terminal is inoperable.

Rail Transport

This would be a third source for delivery of smaller consignments of gypsum, anhydrite, limestone, pozzolan, clinker, and portland cement. This option would provide access to raw material sources in Arizona, Nevada, and California. The existing rail line network extends south along the western edge of the site and would be upgraded as part of the VMT component of the project. Rail cars would be unloaded via truck transfer and closed pipe to one of the adjoining Orcem material storage areas or the fully sealed Storage Silos (for fine materials such as cement).

Truck Transport

A fourth alternative source for delivery of gypsum, anhydrite, pozzolan, and limestone to the plant is via truck. Most materials delivered via truck would come from sources in California (outside the local area) and Nevada.

Table 2-4
Summary of Maximum Material Volumes and Transport Methods –
Orcem Phase 1 and Phase 2 Volumes

Orcem Phase	Annual Production (metric tons)	Max. Monthly Materials In Via Ship (metric tons)*	Max. Monthly Materials In Via Truck (metric tons)	Max. Monthly Materials In Via Rail (metric tons)	Max. Trucks Out / Day	Max. Rail Cars Out / Week**	Unit Trains/ Week
Phase 1	< 500,000	40,000	6,600	10,000	130 (2,948 metric tons)	31 (1,451 metric tons)	4
Phase 2	900,000	63,400	10,450	10,000	189 (4,286 metric tons)	31 (1,451 metric tons)	4

Notes:

* The Orcem maximum monthly shipping volume is included in the 160,000 monthly metric tons identified in Table 2-3. Truck volumes for Orcem materials are estimated at 22 metric tons per truck.

** Orcem rail volumes are based on a maximum 800 rail cars per year and 91 metric tons per car. The Orcem rail cars are included in the 77-car trains associated with VMT identified in Table 2-3.

2. Movement of Materials from Ships to On-site Orcem Plant

The following discussion provides more detail regarding the movement of raw materials from the ships to the Orcem Plant under Orcem Phases 1 and 2.

Phase 1 (up to 500,000 metric tons of throughput annually)

- The discharge rate using either geared ships or self-discharge ships would be an average of 660 metric tons per hour.

- The shipside hoppers, or metal collection bins into which particulate material (such as GBFS) is discharged from docked ships, would have a capacity of 80 metric tons. In Phase 1, the mobile hoppers at the dockside would feed onto a common mobile conveyor system. Raw materials (GBFS and clinker) would be loaded onto a continuous, covered belt conveyor system from the shipside all the way to the storage areas (a distance of up to 1,000 feet). This conveyor system would operate at an average rate of 660 metric tons per hour and would be located within an easement across the VMT Site as shown in Figure 2-6.
- In the case of GBFS, during Phase 1, the conveyor would discharge the material in the open storage area. This material would then be consolidated into a managed pile as described below.
- In the case of clinker, during Phase 1, the conveyor would discharge the material into the covered Raw Material Storage Building (Building no. 8 as listed in Table 2-2).

Phase 2 (up to 900,000 metric tons of throughput annually)

- In Phase 2 the mobile hoppers at the dockside would continue to feed onto a common mobile conveyor system. Raw materials (GBFS and clinker) would be loaded onto a continuous, covered belt conveyor system from the shipside all the way to the storage areas (a distance of up to 1,000 feet). This conveyor system would operate at an average rate of 660 metric tons per hour, and would be located within an easement area across the VMT Site as shown in Figure 2-6.
- In the case of GBFS during Phase 2, the conveyor system would discharge the GBFS in the area of the open stockyard floor. This material would then be consolidated into a managed pile as described below.
- In the case of clinker, during Phase 2, the conveyor system would discharge the clinker using an internal conveyor with a belt tripper in the covered Raw Material Storage Building.

3. Storage of Raw Materials

Storage Area for GBFS

GBFS (and other raw materials except for clinker) would be stored in open stockpiles for management in the designated storage areas as shown in Figure 2-9. As the material is naturally coarse and moist (with between 6% and 12% moisture content on delivery), there is no need to take any special precautions with respect to fugitive dust emissions. When stored in a pile over a prolonged period of time, the material has a tendency to harden on the surface through agglomeration to form a crust which seals the stockpile. However on reclaim, as described below, this material may be less moist and in these circumstances a stockpile water spray system would be in place to prevent fugitive dust emissions.

GBFS Stockpile Management

The GBFS would be transported from the ship to the stockpile by a series of covered belt conveyors. The conveyor would discharge the GBFS in the designated stockpile areas, and the material would be distributed with mobile stacker conveyors to form a maximum height of 40 feet. A front-end loader would move and lift this material as necessary. GBFS would be excavated using the same front-end loader and placed into the reclaim hopper for transport to the processing plant.

Storage Area for Clinker

Clinker would be stored in the designated enclosed storage building. As this material is naturally dry and hygroscopic, there is a need to enclose this stockpile to prevent rainfall and atmospheric moisture damaging the product. The clinker stockpile would be managed as described in the following paragraph.

In Phase 1 and Phase 2 of the Orcem operations, clinker would be transported to the enclosed Raw Material Storage Building by covered belt conveyors from the dockside (see Figures 2-10a, 2-10b, and 2-10c). The horizontal belt conveyor would be fitted with a traveling tripper which would allow the clinker to be discharged at sequential positions along the storage building floor to form a chevron stockpile with a maximum height of approximately 50 feet. The Raw Material Storage building would be equipped with an air filtration system to ensure that any particulate emissions created by either the stockpiling or reclaim process would be captured in the filters, and fugitive particulate emissions would be maintained within agreed permit limits, thereby allowing only clean air to leave the building. Material would be excavated from the face of the stockpile using front-end loaders and placing the clinker into the reclaim hopper of the conveyor feed to the processing plant.

4. Transport of Raw Material from Stockpile Area to the Process Plant

The raw materials would be taken from the stockpile areas and placed into a reclaim hopper of 2,000-cubic-foot capacity at ground level in the storage area. From this point the clinker or GBFS would move by covered belt conveyor to a bucket elevator which would discharge the material into a mill feed hopper with a capacity of 5,000 cubic feet. Alongside this mill feed hopper would be a smaller mill feed hopper with a capacity of 1,500 cubic feet, which would contain limestone and/or gypsum and other raw materials.

The clinker or GBFS would discharge from these mill feed hoppers via weigh belts which would regulate the flow of clinker or GBFS and gypsum/limestone (and other raw materials) onto the inclined covered belt conveyor to the processing plant and ensure that the conveyor feeding the processing plant receives the desired total feed rate of material for processing in the mill, typically between 70 and 100 metric tons per hour.

5. Drying and Grinding Raw Materials

The processing plant would be used to grind (or mill) the raw materials, dry them, and collect the product to capture the finished product. All of the equipment needed for this process would be contained within the Mill and Filter Buildings.

Milling Process

The proposed Orcem Plant would use an electric-powered vertical roller mill (VRM). Raw material is fed to the VRM via an airlock onto the center of a rotating grinding table, where the VRM grinds the raw material to fine powder. The milling process requires high flow of air to pass through the mill. As a result, the material within the mill is subject to a high velocity airflow, which passes up, around, and over the grinding table. The airflow's primary function is to lift ground material particles from the table and convey them into an internal particle size classifier, aka a high efficiency separator, which directs particles as either small enough to meet the finished product or in need of further grinding.

Drying Process

The GBFS enters the mill with a moisture content of between 6% and 12%, but to properly store and transport the finished product the material must be dried to a moisture content of less than 0.2%. The high volume of air required for the milling process is also very effective at drying the material being processed. In some cases, additional heat is required to complete the drying process. In this process, the additional heat would be supplied by a natural gas-fired hot air generator which would preheat the air coming into the VRM to a temperature sufficient to evaporate the excess moisture during milling.

The process air pulled through the mill and internal separator exits the mill with the particles sufficiently small enough to meet the finished product specification entrained. This combined air and finished product stream then enters the main bag filter unit where the finished product is collected on the surfaces of fabric filters and the clean moist air is drawn through the filter unit by an induced draft fan, commonly called the main mill fan.

The outlet of the main mill fan leads to a vertical vent stack where the air leaves the processing plant along with any moisture evaporated from the raw materials. The finished product collected in the main bag filter is transported by an enclosed air-slide conveyor to a bucket elevator which lifts the product and discharges it to the product Storage Silos.

6. Storage, Loading, and Transport of Finished Product

The finished product would be stored in three large sealed finished product Storage Silos, each with a capacity of up to 5,000 metric tons. These Storage Silos would hold the various finished products prior to transport to the loading silos. Each silo would be up to 46 feet in diameter and approximately 140 feet in height.

The bottoms of the large finished product Storage Silos would be aerated to fluidize (the process of converting granular material from a static solid-like state to a dynamic fluid-like state) the finished product powder for discharge. When the finished product is withdrawn from the Storage Silos, it would be transported in enclosed conveyor systems into smaller loading silos of approximately 80-metric ton capacity each for loading of tanker trucks and rail tankers (via tanker truck transfer).

There would be two loading silos configured at the Outload Building for loading tanker trucks. Each loading silo would have its own belowground Weighbridges, or scales, to monitor truck weight as they are loaded. The road transport vehicles would be tractor–trailer configurations, with standard tractors and single or double pneumatic dry bulk tank trailers. The tank trailers (commonly referred to as cement trucks) would be sealed and have loading hatches on top. In order to load the trailers with product, the hatches would be opened, loading bellows would descend, and their nozzle(s) would seal onto the tanks to be loaded. A computer-controlled filling system would be activated, and the tankers would be loaded to the desired level by the control system monitoring the Weighbridge. After the loading process is complete, a bill of lading would be printed for the driver to document that all tanker trucks leave the plant with the prescribed load on board.

Rail tanker cars would be served from the filling facility via tanker truck transfer using the upgraded and realigned California Northern Railroad rail spur line which currently extends into the adjoining VMT Site, running parallel to Orcem's western boundary.

Site Access and Parking

The entrance/exit at the southern end of the Orcem Site boundary, as shown in Figure 2-6, would be used by traffic dedicated to hauling small amounts of raw materials by truck into the on-site raw material storage areas. It would not be used by customer traffic. A dedicated entrance located south of the office building would accommodate a flow of customers and staff separate from the flow of trucks headed to the outload facility. These vehicles would move in a northerly direction and exit the site through the gate located at the northern site boundary. Parking for customers and employees would be provided at both the office building and at the north end of the Processing Mill and Filter Buildings. A total of 20 parking spaces would be provided on the Orcem Site.

Staffing

The Orcem Plant would create approximately 100 jobs for the duration of the estimated 15-month construction phase. Once the Orcem Plant is operating, the plant systems would be operated by up to 20 full-time employees, operating in shifts during a 24-hour period, together with up to 20 administrative and sales staff, for a total of up to 40 full-time jobs at the facility (applies to both operational Phases 1 and 2).

2.4.3 Infrastructure

A storage area for an aboveground diesel fuel tank for filling site mobile equipment, together with associated spillage protection systems, would be provided in the surface water drainage network on the VMT Site. An aboveground diesel storage tank with appropriate safety equipment and associated spillage protection systems for fueling of Orcem Site mobile equipment would also be provided adjoining the concrete boundary wall between the GBFS and gypsum storage areas. In addition, a free-draining, permeable stone finish would be provided in the storage areas of the Orcem Site. All other areas, including vehicle roadway and parking areas, and those areas surrounding the Orcem Plant, would be finished with an impermeable asphalt or concrete surface.

An existing 8-inch to 10-inch diameter looped water main currently serves the overall site, delivering raw water for fire protection purposes. This fire protection system would be upgraded as needed with placement of approved fire hydrants, and permanently maintained in accordance with fire department standards to provide sustained water volumes for fire suppression purposes on the entire site.

Landscaping would be provided along the western and northern boundaries of the Orcem Site to partially screen equipment and materials. Potential installation of solar energy facilities would be placed on site to partially offset dependence on external electric power for plant operations and administrative uses. The future installation of solar panels would be subject to City review and approval.

The northern VMT Site boundary (adjoining Derr Avenue) would remain secured with fencing and would continue to be served by the existing gated entrance. A rock jetty would be placed within the alignment of (and replace) the existing fence at the southern end of the VMT Site. A new chain-link fence would be installed along the top of the jetty and extend east to connect with the VMT Site boundary fence. The purpose of the rock jetty and fence is to improve site security by creating a stronger deterrent to trespassers. Perimeter site fencing would be repaired as necessary, as part of an overall effort to enhance site security consistent with marine terminal security requirements. Site lighting would be provided throughout the project site where necessary for safety. All lighting would be shielded or designed to prevent off-site glare.

2.4.4 Off-Site Improvements

Public Access Improvements

Public access is required by BCDC as a condition of approval for most shoreline developments. As defined by BCDC's law, the McAteer-Petris Act, every proposed development should provide "maximum feasible public access, consistent with a proposed project." Because the project site would be a secured site in accordance with Department of Homeland Security regulations, off-site public access improvements are proposed in lieu of providing direct public access to the waterfront on the project site.

The proposed public access improvements are consistent with the City of Vallejo's Marina Master Plan and policies presented in the San Francisco Bay Plan. The proposed public access improvements would involve installation of a new self-propelled personal watercraft launch within the Vallejo Municipal Marina. Several options for alternative improvements were evaluated by the project sponsors and the City of Vallejo. The improvements selected for evaluation as part of the proposed project would be located just north of the access ramp to K Dock at the south end of the City of Vallejo Municipal Marina, which is located approximately 2 miles north of the project site. The proposed launch ramp, shown in Figure 2-11, would consist of a pre-cast articulated concrete mat, approximately 10 feet wide by 60 feet long, over a geotextile fabric. The top of the launch ramp would be approximately 8 feet above MLLW, and the bottom of the ramp would be 2 feet below MLLW. The launch ramp would not require any dredging and would be located in an area with ample public parking and restrooms.

Construction of the new personal watercraft launch would include the following components:

1. Prior to the start of construction activities, the work area would be secured with temporary construction perimeter control, and the in-water area would be boomed with a silt curtain to control turbidity.
2. The existing riprap would be removed and stored using an excavator.
3. Grades would be set for correct slope layout and control.
4. The excavator would grade the bottom to the correct elevation and slope for the new ramp design.
5. Base rock would then be placed in the footprint of the new ramp and screeded evenly along the slope.

6. The articulated mat sections would be rigged to an engineered picking frame and placed section-by-section, working from the offshore end of the ramp to the shore connection.
7. The stored riprap would be replaced around the perimeter of the new launch.
8. A poured-in-place concrete apron would be installed between the existing multi-use path and the new launch mat to ensure a smooth transition from the path to the launch.
9. Upon completion of the work, the silt curtain would be removed and the site demobilized.

Dock Removal

BCDC's authority over the water of the San Francisco Bay (Bay) relates primarily to Bay fill. As described in the McAteer–Petris Act, Bay fill (solid fill, pile-supported fill, floating fill, and cantilevered fill) can be approved by the BCDC only for water-oriented uses. When a water-oriented use is approved, compensatory mitigation is typically required as part of permit approval. Because part of the construction of the proposed VMT component of the project includes Bay fill, the project would also include mitigation in the form of several off-site alternatives; the required CEQA evaluation for several of these alternative measures is provided in other documentation and therefore not included in this EIR. The local mitigation alternative addressed in this EIR as part of the project includes the removal of existing deteriorated dock improvements within the water area shown in Figure 2-12 at the north end of the City's Municipal Marina. Approximately eighty (80) 14-inch-diameter creosote timber piles and deteriorated dock facilities would be removed from this portion of the marina. Removal of the deteriorated dock improvements would reduce the shaded habitat within the marina by 10,338 square feet (0.24 acre), and removal of the timber piles would increase benthic habitat within the marina by 87 square feet. Timber removed from the existing docks and the creosote timber piles would be separated based on recyclability. Recyclable and non-recyclable material would be sent to the closest appropriate facility.

Prior to demolition of the deteriorated dock improvements, the work area would be secured with a temporary debris boom to prevent debris from entering the waters of the Municipal Marina. The entire in-water work area would be surrounded by a silt curtain to control turbidity. The unused section of deteriorated walkway floats would be removed and transported to shore. Upon completion of the in-water work, the silt curtain would be removed and the site demobilized. The equipment proposed for removal of deteriorated dock facilities within the northerly mitigation site includes an excavator equipped with a hydraulic breaker, a debris boom, a silt curtain, and a skiff.

2.4.5 Development Agreement and/or Community Benefits Agreement

As noted in the preceding descriptions, the proposed project calls for a substantial investment in site, access, and equipment improvements over a lengthy period of time, including the following: construction of upgrades to the existing rail line and public roadways serving the site, construction of a new wharf and rock dike, demolition and reuse of materials from the former General Mills buildings, utility improvements, site drainage improvements, public access improvements (off-site), and construction of a new GGBFS Processing Mill and numerous related buildings and equipment. These improvements require a substantial initial capital investment associated with the first phase of the respective project components, and further subsequent investments related to their phase two capital improvements. In order to ensure that the property can be developed and operated in accordance with the approved Major Use Permits and that the policies, ordinances, and fees in effect at the time of project approval would apply, the project applicants are proposing that the City either: (1) approve a Development Agreement, as provided for under Government Code Sections 65864 through 65869.5, and City Code Chapters 17.10 through 17.20; and/or (2) approve and become party to a contractual Community Benefits Agreement. The Development Agreement and/or Community Benefits Agreement would have a term of up to 15 years and could address a wide range of project and community goals, including but not limited to the following: (1) provide assurances that the project is consistent with applicable local policies, standards, and fees currently in effect, in order to facilitate the substantial capital investment needed to implement the combined project; (2) ensure that all planned improvements are constructed and operated in a manner consistent with the approved Major Use Permits; (3) provide for annual monitoring and verification of compliance with all applicable Major Use Permit Conditions of Approval and certified Final EIR Mitigation Measures; (4) meet living wage and prevailing wage requirements; (5) meet local hiring goals; (6) job training programs; and (7) participation in funding of identified local improvement needs.

SOURCE: ESRI 2013

FIGURE 2-1

Former General Mills Structures

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VMT ANNEXATION BOUNDARY

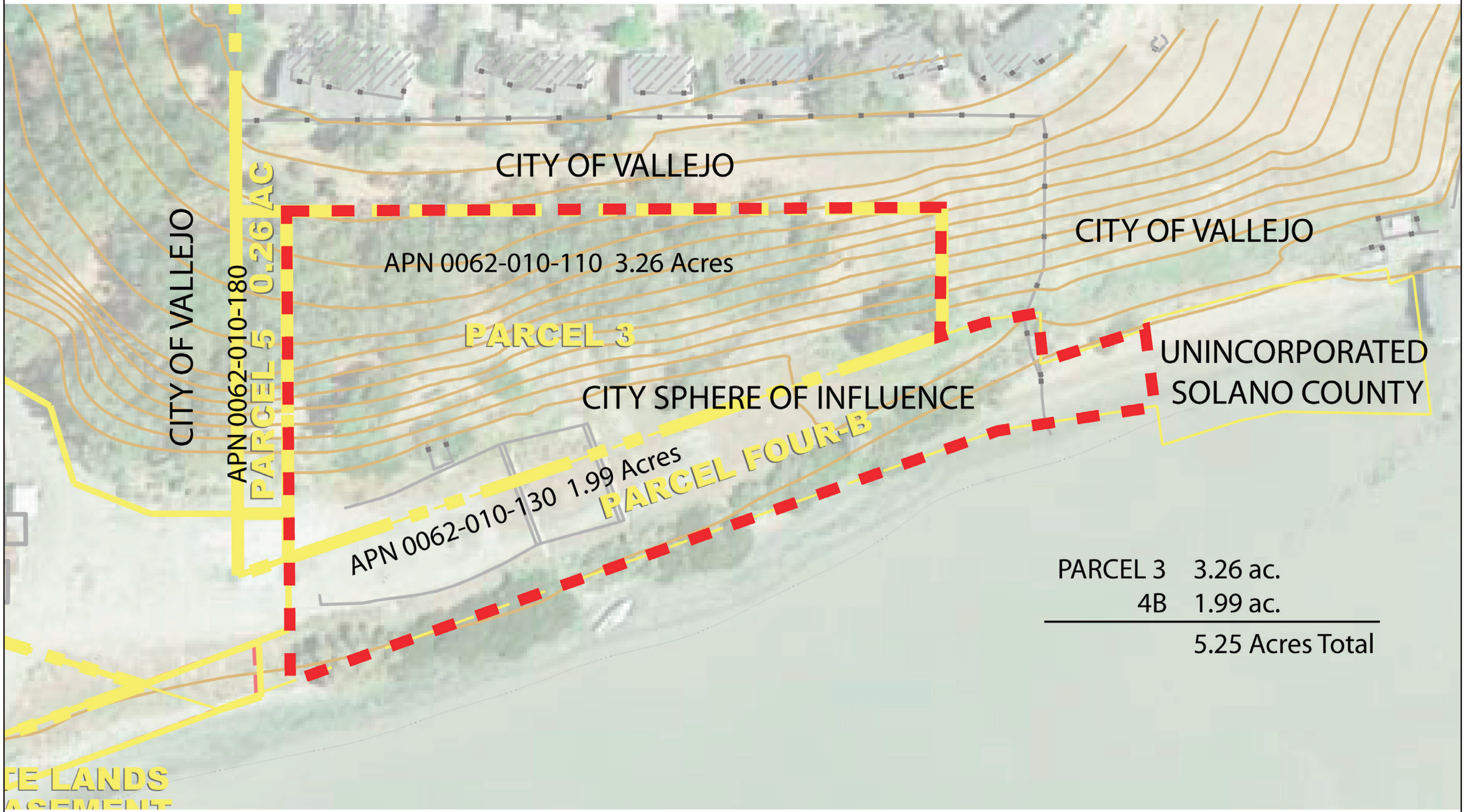

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FIGURE 2-2
Proposed Annexation

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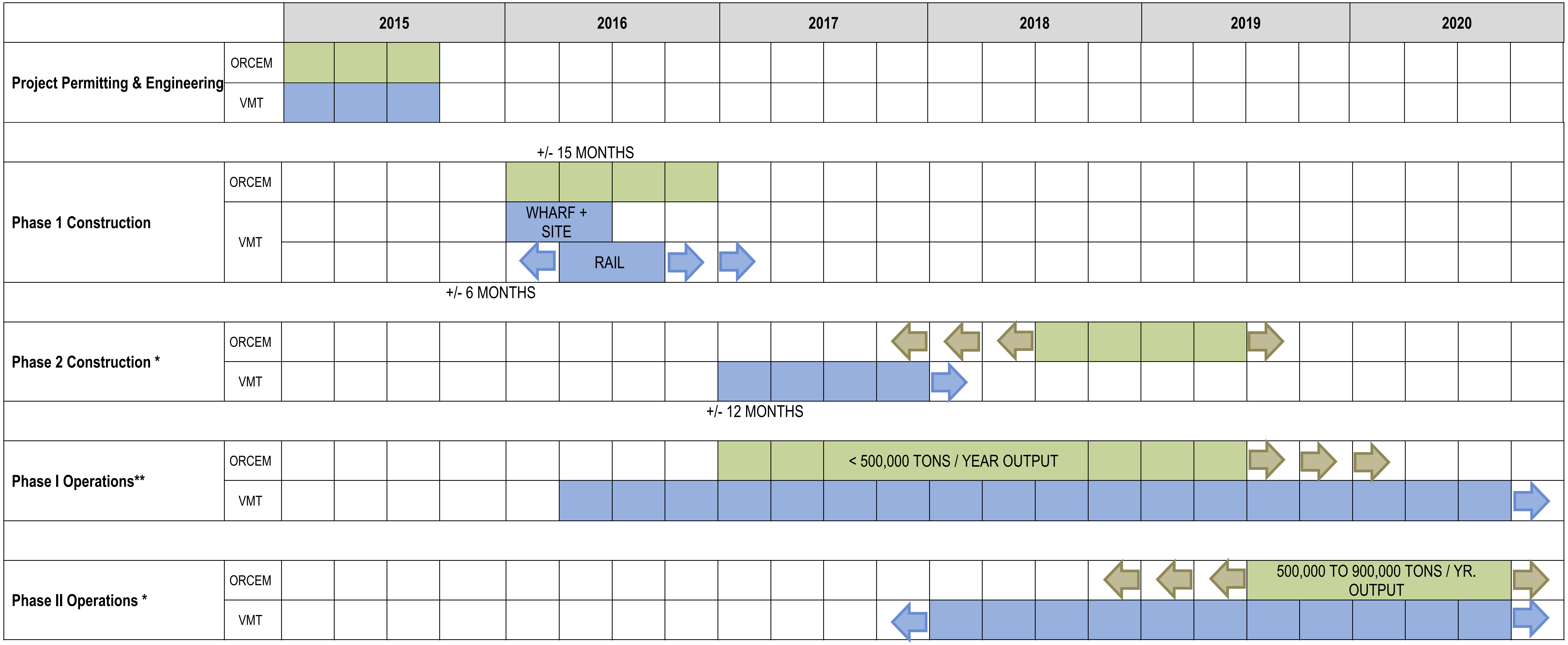
PHASING OF ORCEM & VMT PROJECTS



* Timing for initiation of VMT rail improvements in Phase 1, and for Phase 2 Construction & Operation for both Orcem and VMT will vary based on market demand. The VMT Phase 2 improvements will be constructed after the Orcem Phase 1 construction period is complete.

** Timing for transition from Orcem Phase 1 to Phase 2 Operations is undetermined, and will depend on market demand; various upgrades could be ongoing.

ORCEM	🟩

VMT	🟦

SOURCE: LOEWKE PLANNING ASSOCIATES 2015

FIGURE 2-3
Project Phasing Diagram

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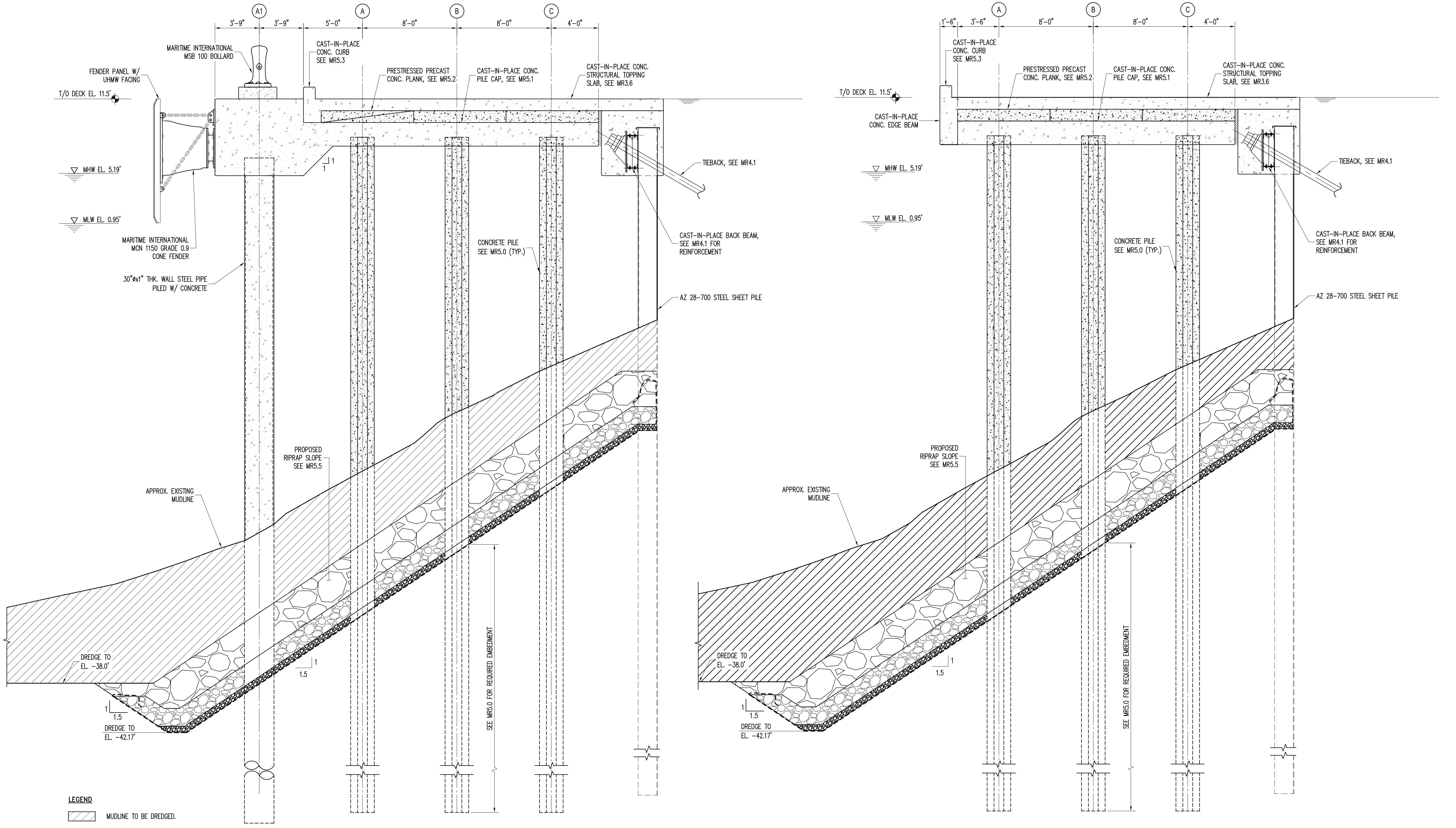

LEGEND

▨ MUDLINE TO BE DREDGED.

NOTES:

1. ELEVATIONS SHOWN REFERENCE N.O.S./S.L.C. DATUM.
2. CONTRACTOR TO INSTALL INDICATOR PILES PER DWG. MR3.4 TO DETERMINE PILE TIP ELEVATION.

A 3.0 **PROPOSED SECTION PILE CAP 2**
1/4"=1'-0"

B 3.0 **PROPOSED SECTION PILE CAP 1**
1/4"=1'-0"

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

SOURCE: MCLAREN ENGINEERING GROUP 2015

FIGURE 2-4
VMT Phase 1 Platform Sections

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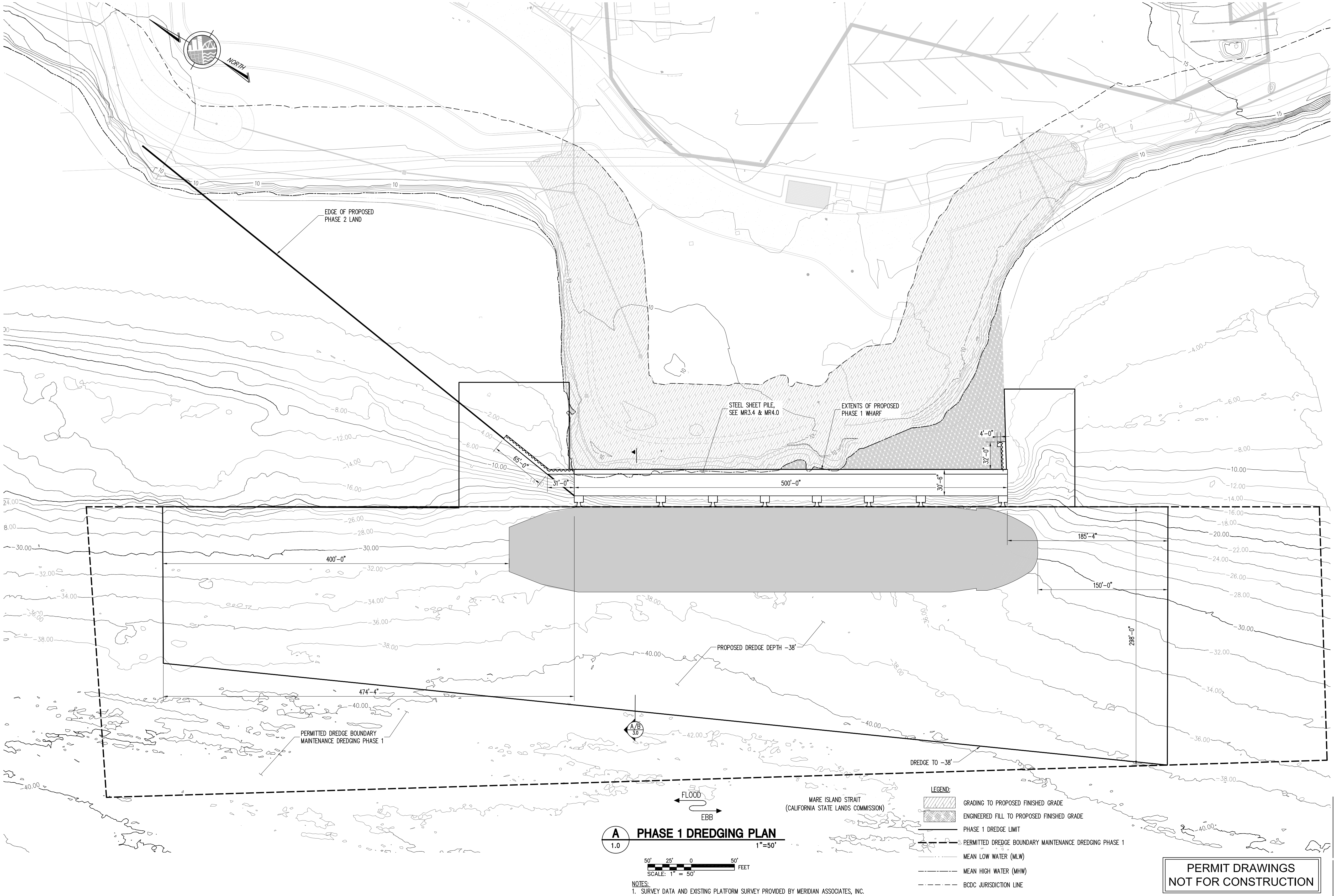

NOTES:
1. SURVEY DATA AND EXISTING PLATFORM SURVEY PROVIDED BY MERIDIAN ASSOCIATES, INC.
2. ELEVATIONS SHOWN REFERENCE N.O.S./S.L.C. DATUM.

SOURCE: MCLAREN ENGINEERING GROUP 2015

FIGURE 2-5
VMT Phase 1 Dredging Plan

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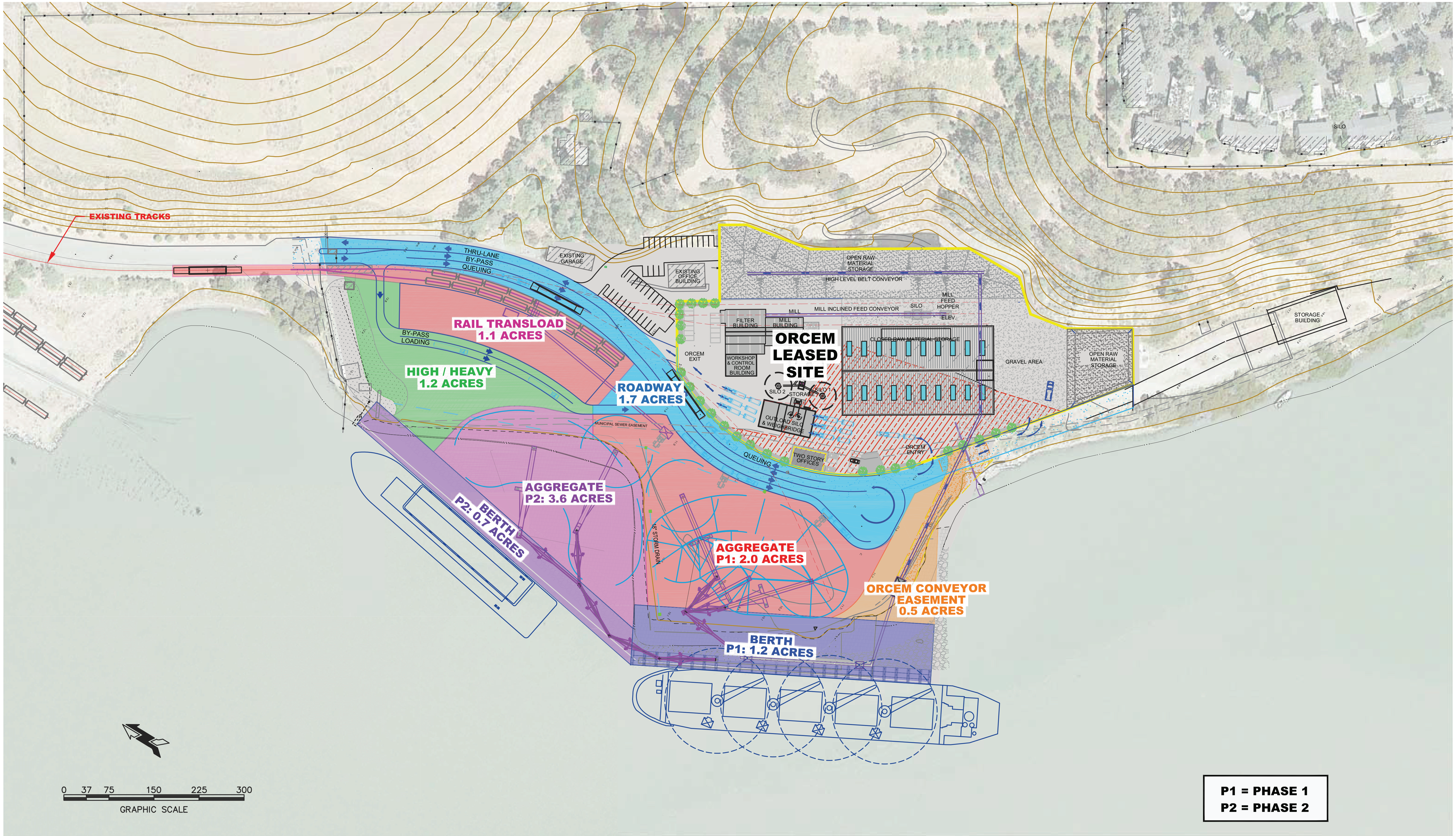

SOURCE: MERIDIAN ASSOCIATES, INC. 2015

FIGURE 2-6

VMT Site Plan

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VALLEJO MARINE TERMINAL AND ORCEM PROJECT DRAFT EIR

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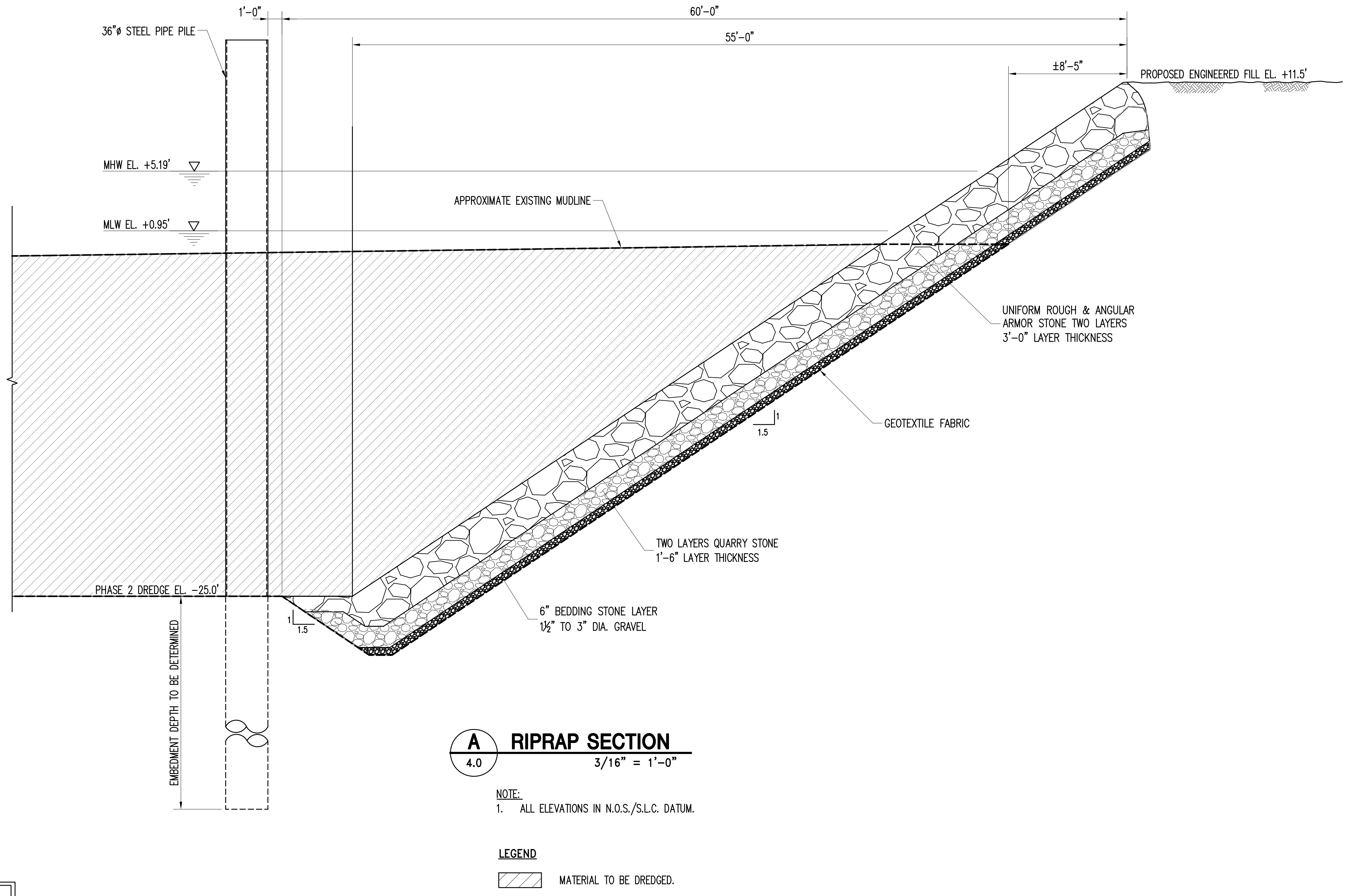

RIPRAP SECTION

3/16" = 1'-0"

NOTE:
1. ALL ELEVATIONS IN N.O.S./S.L.C. DATUM.

LEGEND

▨ MATERIAL TO BE DREDGED.

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

SOURCE: MCLAREN ENGINEERING GROUP 2015

FIGURE 2-7
VMT Phase 2 Dike Section

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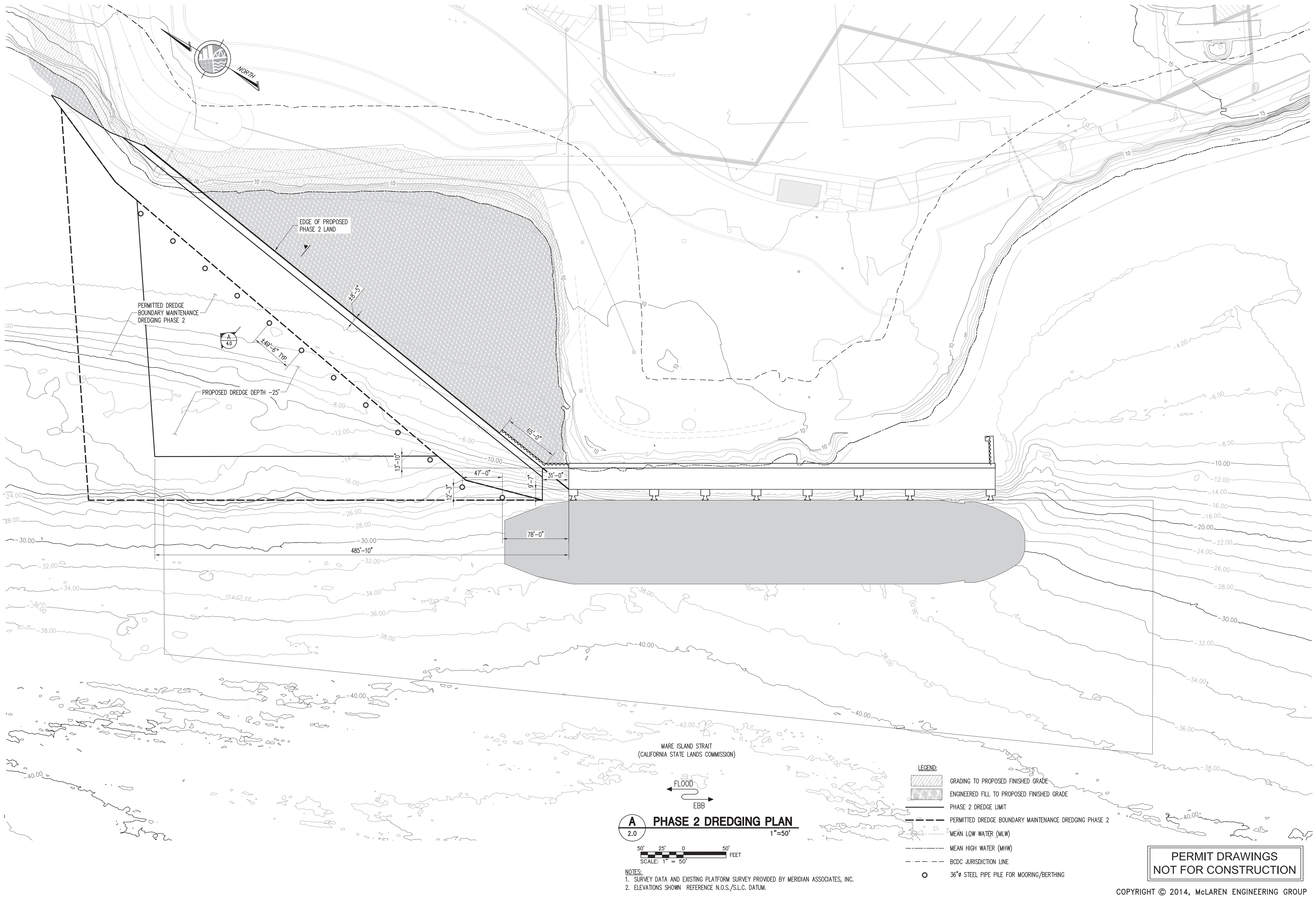

SOURCE: MCLAREN ENGINEERING GROUP 2015

FIGURE 2-8
VMT Phase 2 Dredging Plan

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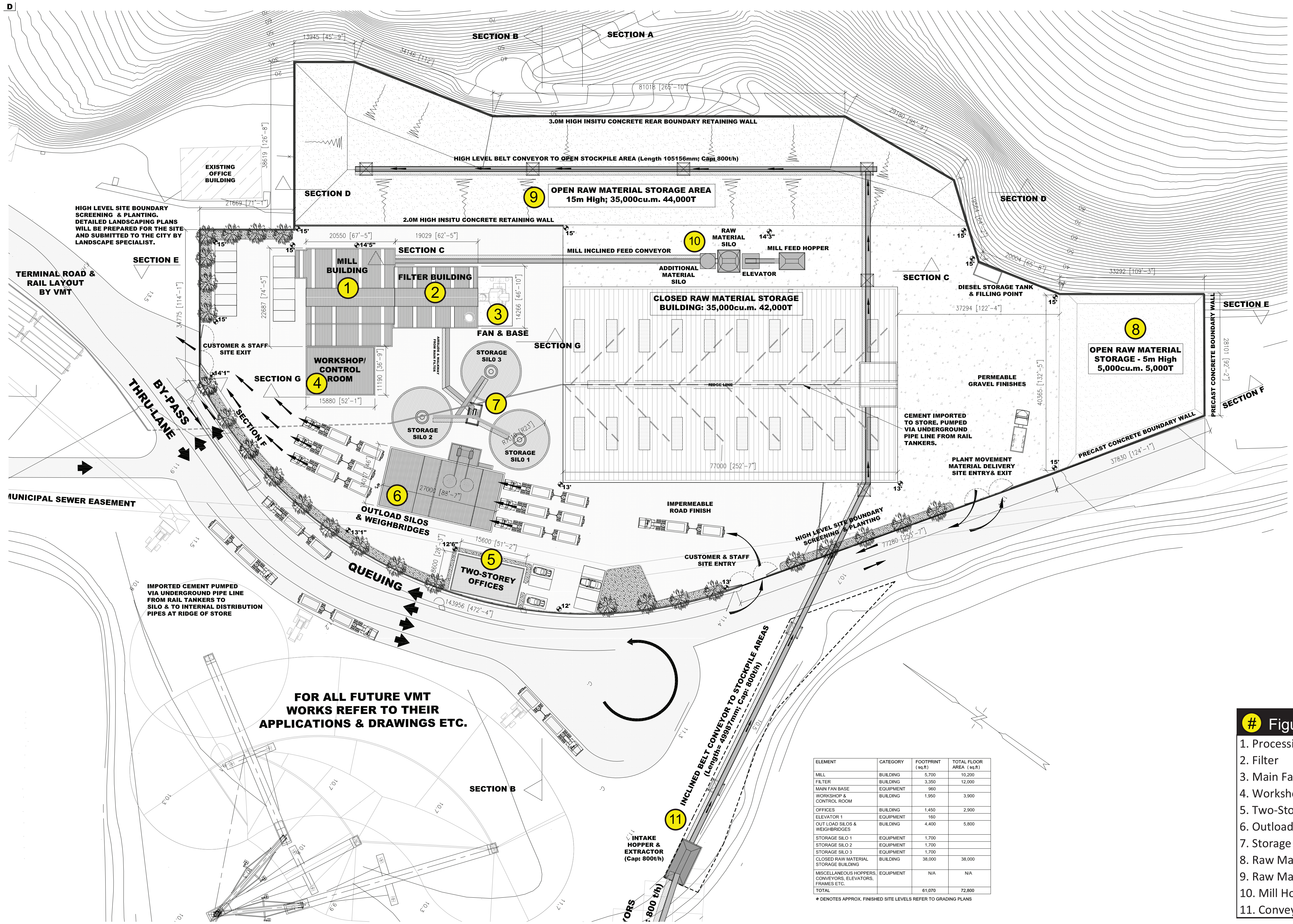

ELEMENT	CATEGORY	FOOTPRINT (sq.ft)	TOTAL FLOOR AREA (sq.ft)
MILL	BUILDING	5,700	10,200
FILTER	BUILDING	3,350	12,000
MAIN FAN BASE	EQUIPMENT	960	
WORKSHOP & CONTROL ROOM	BUILDING	1,950	3,900
OFFICES	BUILDING	1,450	2,900
ELEVATOR 1	EQUIPMENT	160	
OUT LOAD SILOS & WEIGHBRIDGES	BUILDING	4,400	5,800
STORAGE SILO 1	EQUIPMENT	1,700	
STORAGE SILO 2	EQUIPMENT	1,700	
STORAGE SILO 3	EQUIPMENT	1,700	
CLOSED RAW MATERIAL STORAGE BUILDING	BUILDING	38,000	38,000
MISCELLANEOUS HOPPERS, CONVEYORS, ELEVATORS, FRAMES ETC.	EQUIPMENT	N/A	N/A
TOTAL		61,070	72,800

⌖ DENOTES APPROX. FINISHED SITE LEVELS REFER TO GRADING PLANS

 # Figure Element

1. Processing Mill
2. Filter
3. Main Fan & Base
4. Workshop and Control
5. Two-Story Offices
6. Outload Silos & Weighbridges
7. Storage Silos (3) and Elevator
8. Raw Material Storage
9. Raw Material Storage Area
10. Mill Hopper, Silo, and Conveyor
11. Conveyor to VMT Terminal

SOURCE: WALSH GOODFELLOW 2014

FIGURE 2-9
Orcem Site Plan

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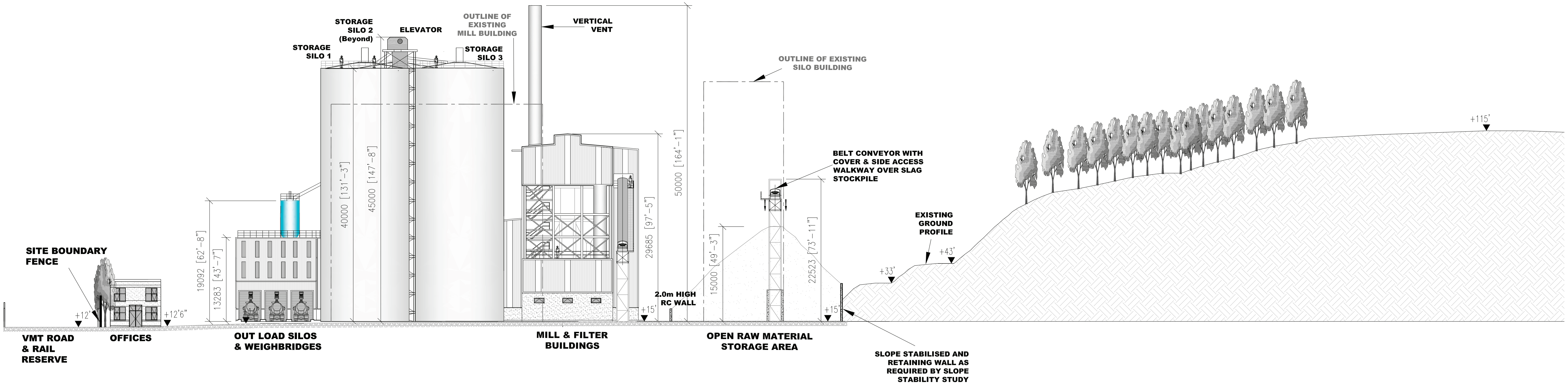
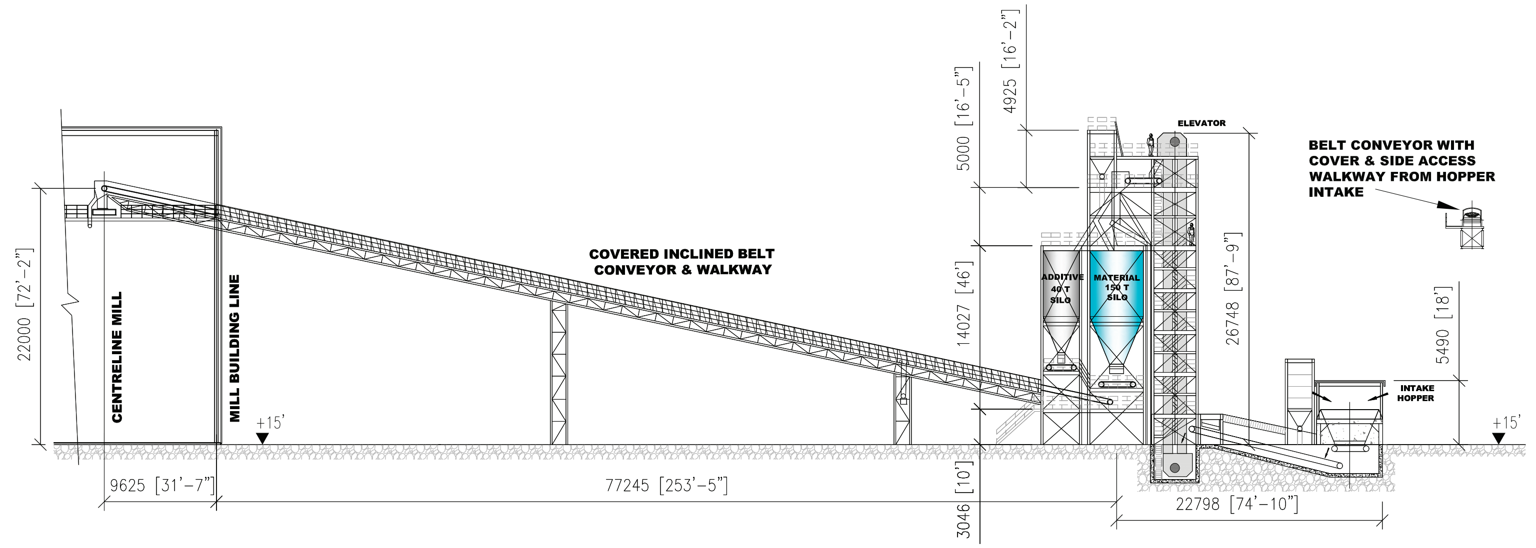


PROPOSED SECTION B-B
THROUGH MAIN SITE



PROPOSED SECTION C-C
THROUGH MILL FEED CONVEYOR

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SOURCE: WALSH GOODFELLOW 2014

FIGURE 2-10a
Orcem Site Sections B and C

VALLEJO MARINE TERMINAL AND ORCEM PROJECT DRAFT EIR

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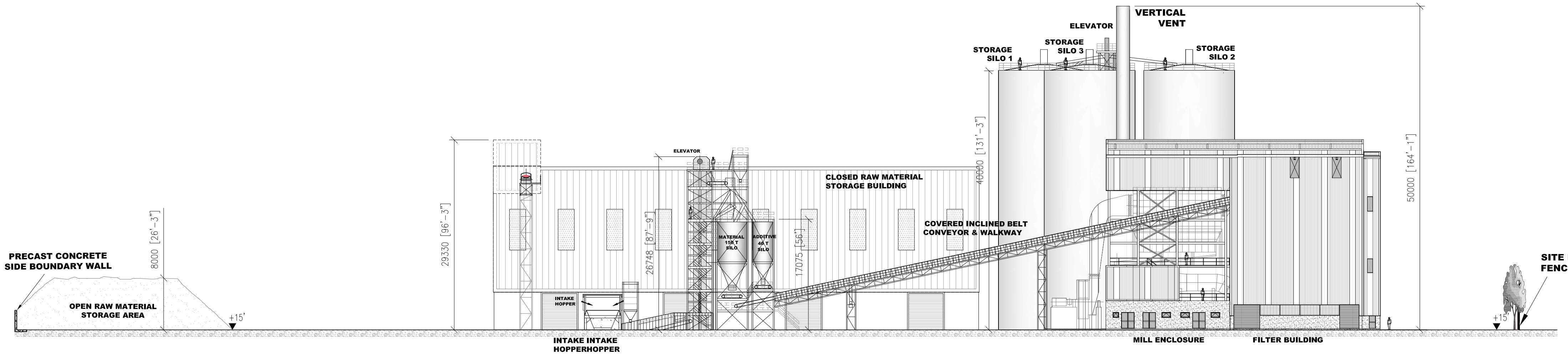
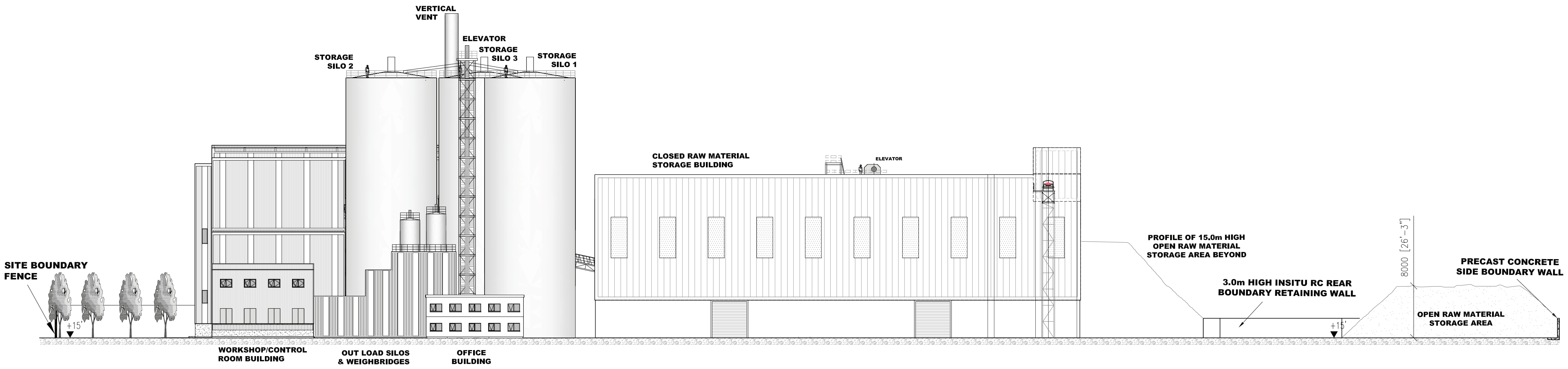
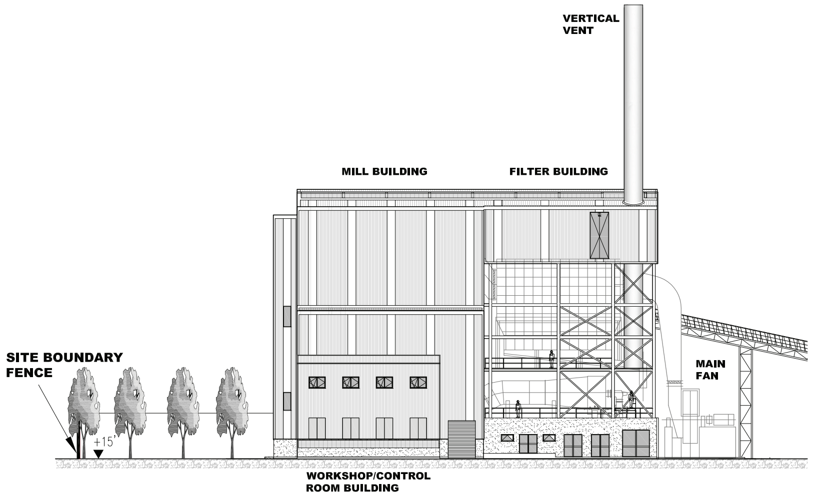


PROPOSED SITE SECTION E-E



PROPOSED SITE SECTION F-F



PROPOSED SITE SECTION G-G

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SOURCE: WALSH GOODFELLOW 2014

FIGURE 2-10b

Orcem Site Sections E, F, and G

VALLEJO MARINE TERMINAL AND ORCEM PROJECT DRAFT EIR

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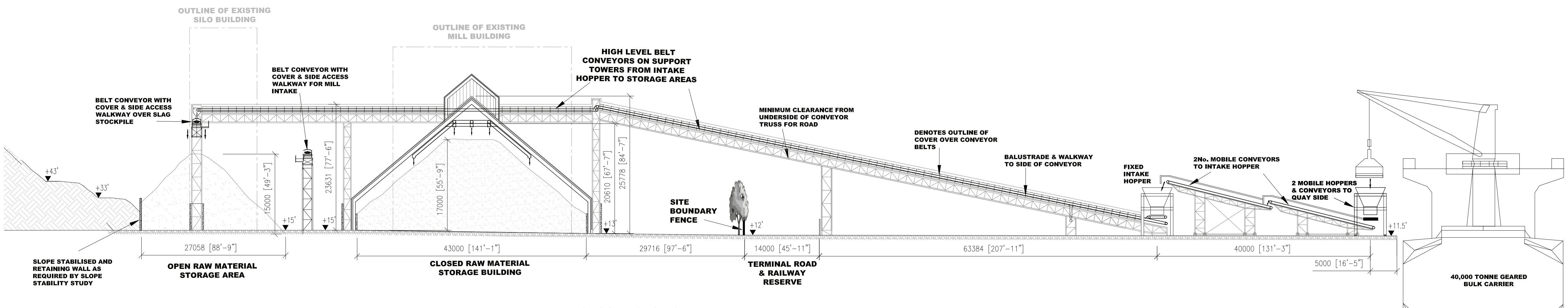
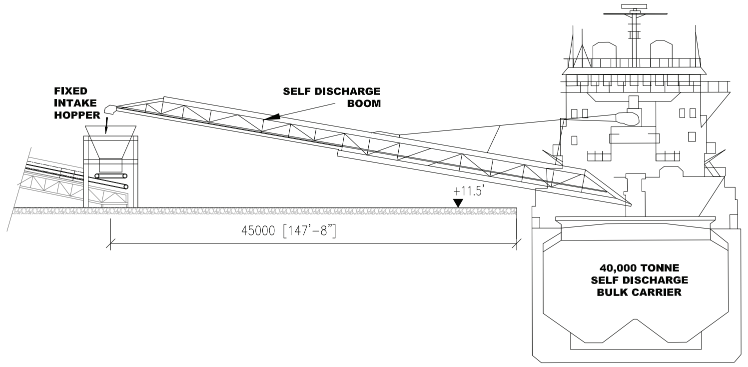
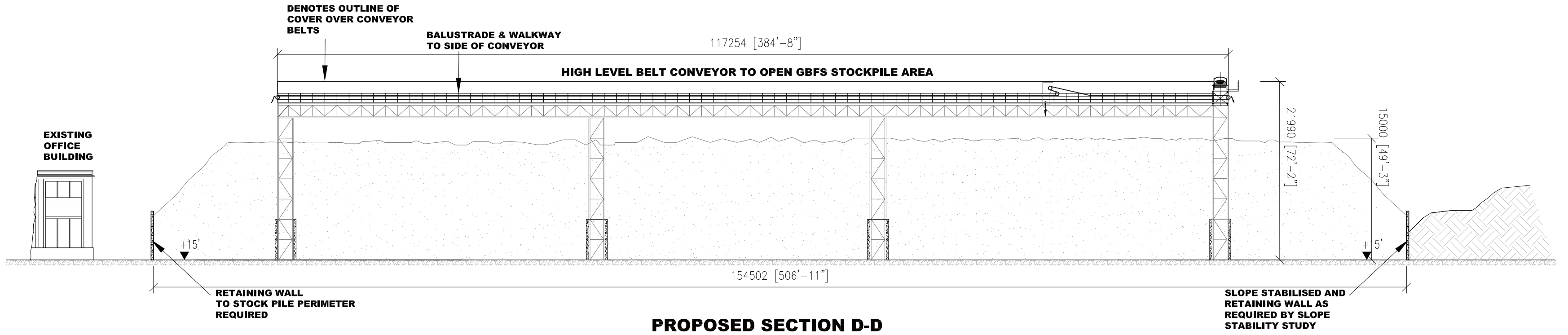


PROPOSED SECTION A-A
THROUGH OVERALL SITE





PROPOSED SECTION D-D
THROUGH OPEN RAW MATERIAL STORAGE AREA

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SOURCE: WALSH GOODFELLOW 2014

FIGURE 2-10c
Orcem Site Sections A and D

VALLEJO MARINE TERMINAL AND ORCEM PROJECT DRAFT EIR

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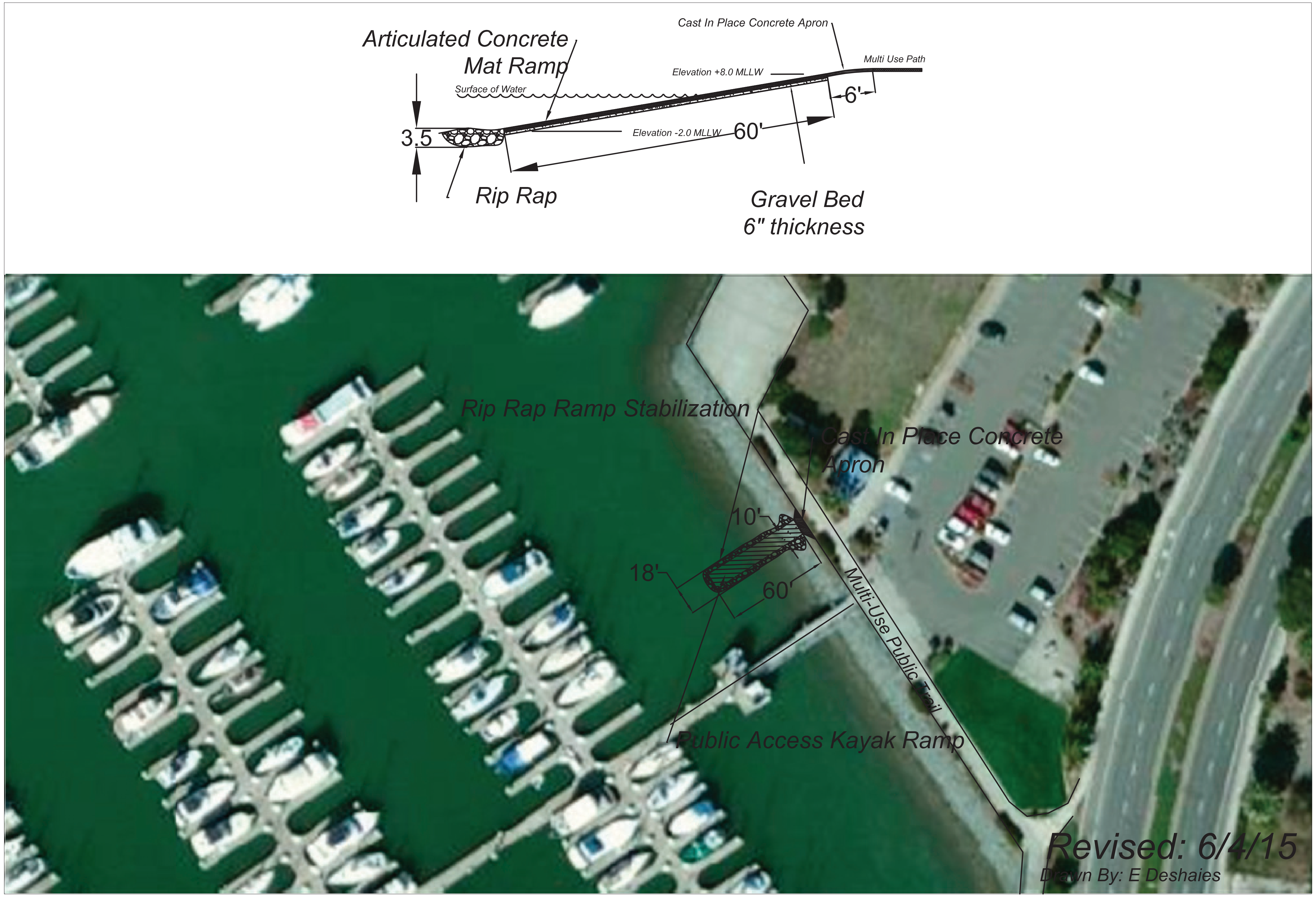
Vallejo Municipal Marina

Proposed Non Motorized Personal Watercraft Launch



Revised: 6/4/15

Drawn By: E Deshaies

SOURCE:

FIGURE 2-11

Proposed Public Access Improvements

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FIGURE 2-12
Proposed Dock Removal

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CHAPTER 3
ENVIRONMENTAL ANALYSIS

The following environmental analysis provides information relative to the environmental topics listed below as they pertain to the proposed project. Each section of this chapter describes existing environmental and regulatory conditions, presents the criteria used to determine whether an impact would be significant, analyzes significant impacts, identifies mitigation measures for each significant impact, and discusses the significance of impacts after mitigation has been applied.

This chapter includes a separate section for each of the following issue areas:

- Section 3.1, Aesthetics
- Section 3.2, Air Quality
- Section 3.3, Biological Resources
- Section 3.4, Cultural Resources
- Section 3.5, Geology and Soils
- Section 3.6, Greenhouse Gas Emissions
- Section 3.7, Hazards and Hazardous Materials
- Section 3.8, Hydrology and Water Quality
- Section 3.9, Land Use and Planning
- Section 3.10, Noise
- Section 3.11, Public Services and Recreation
- Section 3.12, Transportation and Traffic
- Section 3.13, Utilities and Service Systems

Preliminary analysis contained in the Initial Study (included in Appendix A) determined that development of the proposed project would result in either no impact or less-than-significant impacts to the following issue areas: agricultural and forestry resources, mineral resources, and population and housing. These environmental topics are discussed in Section 5.1, Effects Found Not to be Significant, of Chapter 5, Other CEQA Considerations, of this Environmental Impact Report (EIR), and are not discussed in further detail (in accordance with California Environmental Quality Act (CEQA) Guidelines, 14 CCR 15128).

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3.1 AESTHETICS

This section analyzes the potential impacts of the Vallejo Marine Terminal (VMT) and Orcem project (proposed project) with respect to aesthetics and recommends mitigation measures where necessary to reduce or avoid significant impacts. All figures referenced in this section are provided at the end of the section.

The methods used to analyze visual changes associated with the proposed project consisted of an aerial and photographic inventory of the project site and its surrounding land uses, along with documentation of proposed project components using existing available land use and topographic data, and conceptual plans for the proposed improvements.

3.1.1 Regulatory Setting

Federal

There are no federal regulations pertaining to aesthetics applicable to the proposed project.

State

San Francisco Bay Conservation and Development Commission

The San Francisco Bay Conservation and Development Commission (BCDC) is a state agency that was created as a temporary agency by the McAteer-Petris Act in 1965. In 1969, the McAteer-Petris Act was amended to make BCDC a permanent agency. BCDC regulates filling, dredging, and changes in use in San Francisco Bay (Bay). In addition, BCDC regulates new development within 100 feet of the shoreline to ensure the provision of public access to and along the Bay. BCDC is also responsible for ensuring that shoreline property suitable for regional high-priority water-oriented uses, such as ports, water-related industry, water-oriented recreation, airports, and wildlife areas, is reserved for these purposes (BCDC 2014). BCDC planning documents applicable to the project site are described below.

San Francisco Bay Plan

The San Francisco Bay Plan (Bay Plan), which was prepared by BCDC between 1965 and 1969 and most recently amended in 2012, guides the protection and use of the Bay and its shoreline. BCDC has permit jurisdiction over shoreline areas subject to tidal action up to the mean high tide line and including all sloughs, tidelands, submerged lands, and marshlands lying between the mean high tide and 5 feet above mean sea level for the nine Bay Area counties with Bay frontage, and the land lying between the Bay shoreline and a line drawn parallel to, and 100 feet from, the Bay shoreline, known as the 100-foot shoreline band. The Bay Plan provides policy direction for BCDC's permit authority regarding the placement of fill; extraction of materials;

substantial changes in use of land, water, or structures within its jurisdiction; protection of the Bay habitat and shoreline; and maximizing public access to the Bay (BCDC 2012).

Shoreline Spaces: Public Access Design Guidelines for the San Francisco Bay

The BCDC Public Access Design Guidelines provide guidance for site planning and design of public access areas associated with development projects along the shoreline of the San Francisco Bay. The Public Access Design Guidelines is an advisory document based on the Bay Plan policies and is intended to facilitate the design of projects that are consistent with BCDC's policies regarding public access. The following seven public access objectives are provided to help achieve the goal of providing "maximum feasible public access, consistent with the project" (BCDC 2005):

1. Make public access PUBLIC.
2. Make public access USABLE.
3. Provide, maintain and enhance VISUAL ACCESS to the Bay and shoreline.
4. Maintain and enhance the VISUAL QUALITY of the Bay, shoreline and adjacent developments.
5. Provide CONNECTIONS to and CONTINUITY along the shoreline.
6. Take advantage of the BAY SETTING.
7. Ensure that public access is COMPATIBLE WITH WILDLIFE through siting, design and management strategies.

Local

City of Vallejo General Plan

The Vallejo General Plan, adopted in July 1999, establishes the goals and policies guiding land use and development within the City's Planning Area, which includes lands within the City limits and lands outside the City limits but within the City's Sphere of Influence (SOI). The entire project site is located within the City's Planning Area, which includes 5.25 acres that are located outside the City limits in the City's SOI. The portion of the project site within the City limits is designated "Employment" and the portion of the project site located outside the City limits is currently designated "Open Space-Community Park" (City of Vallejo 1999).

The following goals and policies are applicable to the aesthetics and visual quality of the proposed project.

Hillside Development Goal: To preserve the natural character of the hillsides for the enjoyment of all.

- *Policy 1:* Development in hilly areas should be designed to capture views. The development, in turn, should be pleasing to observe from a distance. The appearance of rows along the hillside should be avoided. There should be heavy landscaping to soften manmade features.
- *Policy 2:* Retain areas for visual amenities through development controls to protect the ridgeline and provide for site and design review of all development proposals.
    a. Where a designated ridgeline exists, all structures shall be located so that any roofline is a vertical distance of at least sixty (60) feet from such ridgeline, as determined by the Planning Commission.
- *Policy 4:* Wherever possible, building heights shall be limited so as to minimize visual impact on the hillside and as well as interference with existing view corridors.
- *Policy 12:* Structures located near ridgelines should blend into the natural topography, exhibit a low profile and roof pitches should be angled to follow the slope.

Waterfront Development Goal: To have a waterfront devoted exclusively to water oriented uses, including industrial, residential, commercial and open space uses, which permit public access.

- *Policy 1:* BCDC's Public Access Design Guidelines should be used in reviewing all development proposals. In areas hazardous to public safety or incompatible with public use, in-lieu access at another nearby location may be provided.

City of Vallejo Zoning Code

The portion of the project site within the City limits is zoned "Intensive Use," while the 5.25-acre portion of the project site located outside the City limits does not currently have a City zoning designation. The Intensive Use zoning district is Vallejo's heaviest industrial district. The basic site development standards for the Intensive Use district include a maximum building height of 75 feet (City of Vallejo 2014).

3.1.2 Existing Conditions

The project site contains the former General Mills deep-water terminal and buildings associated with the former General Mills plant. The General Mills plant closed in 2004, and the project site has since remained vacant. The existing structures on the site vary in height from one to eight stories, and in footprint size up to 42,500 square feet, comprising a total of approximately

211,460 square feet of floor area. The location of these structures is shown on Figure 2-1 of this EIR. The southern portion of the site is currently undeveloped.

The project site is bounded by the Mare Island Strait to the west, a steep hillside to the east, rail lines and existing industrial uses to the north, and undeveloped areas to the south. Residential uses are located east and southeast from the site. Photos of the project site were taken from six surrounding locations described below and shown in Figure 3.1-1.

Photo Location 1 – Mare Island

Mare Island is located directly west of the project site across the Mare Island Strait. Mare Island was the first naval shipyard on the West Coast, established in 1854. The base closed on April 1, 1996, and has since been in the process of redevelopment in accordance with the Mare Island Final Reuse Plan and subsequent Mare Island Specific Plan.

Photo Location 1, shown in Figure 3.1-2, is located in the southeastern portion of Mare Island within the Mare Island Shoreline Heritage Preserve. The 215-acre park is currently open to the public Friday through Sunday between 10:00 a.m. and one hour after sunset. Photo Location 1 provides direct views of the project site from across Mare Island Strait and is one of the closest public view points of the project site. The current view of the project site from Photo Location 1 consists of Mare Island Strait in the foreground, the former General Mills buildings and deteriorated wharf along the shoreline, and surrounding hillsides and residential uses in the distance. The large-scale industrial buildings of the former General Mills plant are the primary focal point from Photo Location 1. The view of the northern portion of the project site is characterized by low-scale warehouse structures with undeveloped grassy hills in the background. Views of these hills are unobstructed by the existing buildings in the northern portion of the site. The central portion of the site includes larger buildings up to eight stories in height, which block views of the hillsides immediately behind them, but do not block views of the horizon or other scenic features. Views of the southern portion of the site consist of the undeveloped shoreline and steep hillside covered in trees. Existing residences are visible south and east of the project site from this location.

Photo Location 2 – Independence Park

Independence Park is a waterfront park extending south from the Vallejo Ferry Terminal along the west side of Mare Island Drive/Curtola Parkway. A wide promenade provides a public walking and viewing area along the waterfront and connects Independence Park to surrounding areas. The northern end of the park includes a parking area, open fields, and a landscaped plaza/gathering space. The southern end of the park consists of an open grassy field.

The view from Photo Location 2, shown in Figure 3.1-3, is facing south from the southern part of Independence Park towards the project site. The foreground is dominated by the grassy field, promenade, and associated lighting and fencing. Views to the south include Mare Island Strait, several pier structures, industrial uses along the waterfront, and a mix of developed and undeveloped hillsides. Further in the distance, the Carquinez Bridge, Carquinez Bay, and hills above Crockett are visible. The taller General Mills buildings are visible from this location; however, the lower buildings and waterfront are blocked by features in the foreground. From this viewing distance, the existing General Mills buildings blend into the hills surrounding them and are only visible due to the lighter building materials and large scale of the buildings.

Photo Location 3 – Sandy Beach

Sandy Beach is a small public shoreline area located at the end of Sandy Beach Road, just north of the Sandy Beach residential community and south of the project site. The narrow stretch of beach is bordered by Mare Island Strait to the west and a steep hillside to the east. The view from Photo Location 3, shown in Figure 3.1-4, is looking north toward the project site. A few of the former General Mills buildings located in the southern portion of the project site (within the Orcem Site) are visible from this location; however, these buildings are only partially visible. To the west of the existing buildings, the low-lying waterfront area and deteriorated wharf structure are visible. A small boat that has run aground is present in the foreground, while buildings on Mare Island are visible in the background.

Photo Location 4 – San Pablo Avenue Vista Point

The Vista Point on San Pablo Avenue is located west of the Carquinez Bridge and the community of Crockett. The view from Photo Location 4, shown in Figure 3.1-5, is facing north toward the project site. The foreground is dominated by trees and vegetation surrounding the vista point, as well as the Carquinez Bay. From west to east, the views in the distance include the southern tip of Mare Island, Mare Island Strait, urban development in Vallejo, the project site, steep hillsides topped with residential development, and the Sandy Beach community along the waterfront. A large wharf structure extends west into Carquinez Bay from Sandy Beach and a pier extends from Mare Island south into Carquinez Bay.

The existing buildings on the project site are visible due to their large scale and light colored building materials. From this distance, the existing buildings appear similar to the overall development pattern in the areas further north in the City of Vallejo; however, the buildings stand out given their size and proximity to the viewing location. The waterfront areas of the project site, including the deteriorated wharf structure, are visible from this location, although not easily distinguishable given the distance.

Photo Location 5 – Seawind Drive

Photo Location 5, shown in Figure 3.1-6, is on Seawind Drive in the residential neighborhood above Sandy Beach. A steep hillside separates Sandy Beach from the residential neighborhood above. This viewpoint looks north towards the project site, providing a close-up view of the site and surrounding areas. The existing buildings on the site are visible from this location, as are the wharf structures and low-lying waterfront area. The existing buildings block views of the areas immediately north of the site, including a portion of the water area; however, the buildings are similar in character to the buildings and uses located to the north of the site. Mare Island and the former shipyards and industrial buildings are visible to the north and west beyond Mare Island Strait. The hills of Napa and Sonoma are also visible in the far distance.

Photo Location 6 – Sea Crest Circle

Photo Location 6, shown in Figure 3.1-7, is on Sea Crest Circle just above Sandy Beach (and Photo Location 3). This location provides views to the north and west from a slightly higher elevation to provide a different perspective of the project site. The foreground consists of the steep hillside leading down to Sandy Beach and the southern tip of the project site. From this vantage point, the existing wharf structure and undeveloped waterfront areas of the project site are most visible. With the exception of the large Bakery Bulkhouse building, the existing buildings on the site are blocked by the hillside and vegetation and are therefore not visible from this vantage point. The Bakery Bulkhouse building is a large, white building lacking architectural details. The building blocks views of a small portion of Mare Island Strait from this location. Mare Island Strait and Mare Island are visible to the west of the project site.

3.1.3 Thresholds of Significance

The following criteria, included in Appendix G of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.), will be used to determine the significance of potential aesthetics impacts. Impacts to aesthetics would be significant if the proposed project would:

A) Have a substantial adverse effect on a scenic vista;

B) Substantially degrade the existing visual character or quality of the site and its surroundings; or

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

3.1.4 Impact Discussion

A) Would the project have a substantial adverse effect on a scenic vista?

VMT and Orcem Project Analysis

Construction Impacts

The project site is located along the waterfront on Mare Island Strait in an area that is visible from several public viewing points, as described in Section 3.1.2, Existing Conditions. During construction of the proposed project, a majority of the existing structures on the site would be demolished, and new structures would be erected. The VMT component of the project would be constructed in two phases, beginning with Phase 1, which would involve demolition of several existing structures on the VMT Site (excluding the administrative building, the garage, the manager’s house, the manager’s garage, and the barn) and construction of a new wharf in the general location of the existing wharf structure, and a storage/maintenance building in the southern portion of the site. Construction of VMT Phase 2 would occur at a later time and would involve construction of a rock dike just north of the Phase 1 wharf. The Orcem component of the project would involve demolition of the existing structures on the Orcem Site (completed as part of the VMT component, which would utilize concrete for backfill and site grading purposes) and construction of new manufacturing facilities for the processing of green cement products.

During the construction period of the proposed project, heavy equipment would be present on the site, and marine construction barges and supply vessels would be located off the wharf structure and along the shoreline. Construction staging would occur on the project site and in the water areas adjacent to the site. Although the demolition of existing structures and presence of construction equipment would alter views of the site from nearby locations, construction activities would not block views of the bay from any public viewing points. Additionally, construction activities would be temporary and would not result in a permanent change to any scenic vistas. Therefore, impacts due to construction of the proposed project would be **less than significant**.

Operational Impacts

Once constructed, the proposed project would introduce new buildings and structures to the project site that could affect scenic vistas of the Bay and surrounding landscapes. The primary project components that would alter views of the site include the demolition of existing buildings in the northern portion of the VMT Site, replacement of the existing buildings on the Orcem Site with modern industrial structures, and the expansion and modernization of the existing wharf area. A small storage/maintenance building would also be constructed in the southern portion of the VMT Site. Figures 3.1-2 through 3.1-7 show the existing and proposed views of the project site from the six photo locations described in Section 3.1.2, Existing Conditions. The changes in views from each location are described below.

In addition to the proposed structures that would be developed on the site, once operational, the project would result in an increase in vessels that would travel to and from the project site and would be docked at the VMT Phase 1 wharf and Phase 2 rock dike. It is estimated that an average of up to four vessels would utilize the VMT Phase 1 wharf per month and that up to an additional average of 3.5 barges would utilize the Phase 2 rock dike per month (for a combined average total of 7.5 vessels per month). These ships and barges would travel through Mare Island Strait to the VMT facility, where each would then dock and unload/reload materials for a period averaging up to 5 to 7 days before departing. Mare Island Strait is currently used by commercial and recreational boaters, and the presence of four large ships and 3.5 barges per month as a result of the project would not substantially alter views of the project site or the surrounding environmental setting.

Photo Location 1

As described above, the VMT component of the project would be constructed in two major phases, while the Orcem component of the project would involve one primary construction phase, with a substantially smaller amount of new construction involved in Orcem Phase 2. The visual features associated with operation of the proposed project would therefore differ between Phase 1 and Phase 2 of the VMT component of the project; however, the differences would primarily be visible from Photo Location 1, which is directly west of the project site and provides a clear view of the waterside of the proposed location of the VMT facility. Figure 3.1-2 shows the existing view as well as views under VMT Phase 1 and Phase 2 conditions (including the Orcem component of the project).

As shown in Figure 3.1-2, the removal of the existing buildings in the northern portion of the site would enhance views of the undeveloped hillside to the east, including providing views of existing trees and the historic garage and administration building that would be retained on site for future use. The proposed Orcem buildings would replace the existing industrial buildings in generally the same location. These buildings would be similar in scale and style to the existing industrial buildings and would not create any substantial changes in the view from this location. The proposed Orcem buildings would also be consistent with Hillside Development policies 4 and 12 of the City’s General Plan, which call for buildings heights to be limited to minimize impacts on hillsides and existing view corridors, and for structures to blend into the natural topography. The proposed project would also follow the BCDC Public Access Design Guidelines pertaining to shoreline development by maintaining views of the Bay and the surrounding hillsides and locating shoreline buildings to allow for upland views down to the Bay.

The proposed storage/maintenance building in the southern portion of the VMT Site would primarily be visible from Photo Location 1; however, the building would blend in with the hillside to the east of it and would not block or alter any views in the area. The landside components of the proposed project would be the same under VMT Phase 1 and Phase 2 conditions; however, the waterside improvements of the wharf structure would differ.

Under VMT Phase 1, the existing waterfront wharf area would be expanded and modernized, creating a large concrete structure on the waterfront. VMT Phase 2 would add a rock dike into the water to the north of the Phase 1 wharf. The proposed VMT Phase 1 and Phase 2 improvements (including the Orcem component of the project) would alter views of the site from Photo Location 1 by introducing a modern concrete structure into the mid-ground (Phase 2 improvements would also block views of a small area of shoreline and water). Although the view from Photo Location 1 would be altered under VMT Phase 1 and Phase 2, the proposed wharf and rock dike structures would create a more unified view of the waterside of the project site and would not block any scenic vistas from this location.

Photo Location 2

As shown in Figure 3.1-3, the project site is visible in the background from Photo Location 2; however, specific project features are difficult to distinguish from existing development in the area. From this distance, the proposed structures would appear relatively similar to the existing structures on the site in terms of size and scale. No scenic vistas would be altered as a result of the landside improvements. The proposed wharf structure would create a slight change in the view of the water from this location by introducing a new solid feature along the shoreline in the background. However, since the view is currently obstructed by existing piers and other waterside improvements in the mid-ground, the introduction of a new wharf structure in the background would not substantially alter the view from this location.

Photo Location 3

As shown in Figure 3.1-4, the view of the project site from Photo Location 3 is limited to the proposed Orcem buildings and the southern end of the proposed wharf. From this vantage point, the Orcem buildings would not block any existing views besides a small amount of sky, which is not considered a scenic vista. The wharf and associated structures, including the conveyer system that would connect to the Orcem Site would partially block views of the buildings on Mare Island and would introduce a new structure extending from the horizon into the sky; however, these views are not considered scenic vistas. The view of Mare Island Strait from this location would not be altered as a result of the proposed project.

Photo Location 4

As shown in Figure 3.1-5, the project site is visible in the background from Photo Location 4; however, the specific details of the site are not clearly visible. The proposed Orcem buildings would be located in generally the same location as the existing buildings and would not block any existing views. The proposed wharf would not be clearly distinguishable from this distance and would appear similar to the existing wharf structure. The introduction of the proposed project components would therefore not alter any views from this location, and no scenic vistas would be affected.

Photo Location 5

As shown in Figure 3.1-6, the view north from Photo Location 5 would be altered as a result of the proposed project, specifically the introduction of the VMT wharf and rock dike (Phase 1 and 2) structures and the Orcem (Phase 1 and 2) buildings. The view of the water area just north of the existing wharf would be altered by the introduction of the Phase 2 rock dike, and the Orcem buildings would block a small portion of the water view north of the site along the waterfront. The project would also demolish several buildings that currently block views of the water in this area. Although views of a small amount of water areas would be blocked by the proposed project, the overall view of the Mare Island Strait would not be substantially impacted.

Photo Location 6

As shown in Figure 3.1-7, Photo Location 6 provides a close-up view of the southern portion of the site and the wharf area from a slightly higher elevation, including the proposed 6,000-square-foot VMT component maintenance shed, which would be located in the southern portion of the project site. The proposed project would result in an overall change in the view of the site by introducing more paved areas and new structures; however, from this location most of the structures would be out of view, and the structures in view would not block the existing view of the Mare Island Strait or otherwise impact the view from this location.

As described above, the proposed project would alter the existing view of the site from the six viewing locations and would result in minor view blockages of the Bay from some locations; however, the project would not result in any adverse impacts on a scenic vista. Therefore, impacts would be **less than significant**.

Off-Site Improvements

The proposed project includes two off-site improvements (public access improvements and removal of existing docks) that would take place within the City of Vallejo Municipal Marina located approximately 2 miles north of the project site. The public access improvements would involve installation of a new self-propelled personal watercraft launch ramp just north of the access ramp to K Dock at the south end of the marina. The proposed launch would consist of a pre-cast articulated concrete mat, approximately 10 feet wide by 60 feet long, over a geotextile fabric. Construction of the launch ramp would require the temporary use of construction equipment in the water and on land. The introduction of this equipment would not have a substantial effect on a scenic vista and would be removed following construction. Once installed, the launch ramp would extend 60 feet from the existing sidewalk into the water area between the shoreline and the existing docks. The top of the launch ramp would be approximately 8 feet above mean lower low water (MLLW) and the bottom of the ramp would be 2 feet below MLLW. Given the proposed elevation of the launch ramp and its location amongst existing docks and marine facilities, it would not have a substantial effect on a scenic vista.

The project would also involve the removal of existing deteriorated docks within the water area at the north end of the marina. Approximately eighty (80) 14-inch-diameter creosote timber piles and deteriorated dock facilities would be removed from this portion of the marina. Construction equipment would be temporarily located on the site during demolition activities; however, the equipment would be removed following demolition and would not have a substantial effect on a scenic vista. Although views of the north end of the marina would be altered following removal of the deteriorated docks, this change would not have a substantial effect on a scenic vista.

Since the off-site improvements would not have a substantial effect on a scenic vista, impacts would be **less than significant**.

B) Would the project substantially degrade the existing visual character or quality of the site and its surroundings?

VMT and Orcem Project Analysis

Construction Impacts

As described under threshold A, during construction of the proposed project, a majority of the existing structures on the site would be demolished and new structures would be erected. Heavy equipment would be present on the site and marine construction barges and supply vessels would be located off the wharf and dike structures and along the shoreline. Although the demolition of existing structures and presence of construction equipment would alter the existing character and quality of the site, construction activities would be temporary in nature and would not result in a permanent change in the visual character or quality of the site. Therefore, impacts due to construction of the proposed project would be **less than significant**.

Operational Impacts

Once constructed, the proposed project would introduce new buildings and structures to the project site that could change the existing visual character and quality of the site. Figures 3.1-2 through 3.1-7 show the existing and proposed views of the project site from the six photo locations described in the existing conditions section. The visual character and quality of the project site are most clearly visible in Photo Locations 1 and 5 because the site is in clear view from these locations and is close enough to distinguish how the proposed changes would alter the appearance of the site. Photo Locations 2, 3, 4, and 6 either show only a portion of the project site or are too distant from the site for the details to be visible.

As shown in Figures 3.1-2 and 3.1-6, the proposed project would alter the existing visual appearance of the project site by demolishing existing buildings and constructing new buildings and structures on the site. The proposed Orcem buildings would replace the existing industrial buildings in generally the same location and would be similar in scale and style to the existing buildings that would be demolished. Under VMT Phase 1, the existing waterfront wharf area would be expanded and modernized, creating a large concrete structure on the waterfront. VMT Phase 2 would involve construction of a rock dike in the water area to the north of the Phase 1 wharf. These overall changes shown in Figure 3.1-2 and 3.1-6 would be consistent with the existing visual character and quality of the site, by replacing existing buildings with buildings of similar size, scale, and type. In addition, the visual character and quality of the site would be enhanced through the demolition of deteriorating buildings and wharf structures and the development of the proposed modern structures and facilities. The proposed project would also follow the BCDC Public Access Design Guidelines pertaining to shoreline development by using forms, materials, colors, and textures that are compatible with the Bay and adjacent development.

In addition to the proposed structures that would be developed on the site, once operational, the project would result in an increase in vessels that would travel to and from the project site and would be docked at the VMT wharf and rock dike. It is estimated that up to four ships would utilize the VMT Phase 1 wharf per month, and an additional 3.5 barges would utilize the VMT Phase 2 rock dike per month. These vessels would travel through Mare Island Strait to the VMT facility, where they would then dock and unload/reload materials for a period averaging up to 5 to 7 days before departing. Mare Island Strait is currently used by commercial and recreational boaters, and the presence of between four ships and 3.5 barges per month as a result of the project would be consistent with the existing visual character and quality of the area.

With implementation of the proposed project, the visual character and quality of the site and its surroundings would be similar to existing conditions and would be moderately enhanced by the project. Therefore, impacts to visual character and quality would be **less than significant**.

Off-Site Improvements

As described under Threshold A above, the proposed public access improvements and dock removal would take place at the City of Vallejo Municipal Marina. The public access improvements would involve installation of a new self-propelled personal watercraft launch ramp just north of the access ramp to K Dock at the south end of the marina as described earlier. Construction of the launch ramp would require the temporary use of construction equipment in the water and on land. The introduction of this equipment would not substantially degrade the existing visual character or quality of the area and would be removed following construction. Once installed, the launch ramp would extend 60 feet into the water area between the shoreline and the existing docks. The launch ramp would be constructed in an area surrounded by existing docks and marine facilities and would complement the visual character and quality of the marina.

The project would also involve the removal of existing deteriorated docks within the water area at the north end of the Marina as described above. Construction equipment would be temporarily located on the site during demolition activities; however, the equipment would be removed following demolition and would not degrade the visual character or quality of the area. Removal of the docks would improve the visual character and quality of the north end of the marina by eliminating the deteriorated portions of the docks that are not in use and restoring the open water area.

Since the off-site improvements would not substantially degrade the visual character or quality of the marina and its surroundings, impacts would be **less than significant**.

C) Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

VMT and Orcem Project Analysis

Construction Impacts

As described under threshold A, heavy construction equipment and marine construction barges would be present on the site and in the water adjacent to the site during construction of the proposed project. Use of this equipment after dark would require the use of lighting for safety and security purposes. The topography of the project site would block views of any construction lighting from locations east of the site. Construction lighting could be visible from the eastern side of Mare Island and partially visible from shoreline areas to the north and south of the site. Given the developed nature of the shoreline north and south of the site, the addition of construction lighting would not be noticeable from a distance. In addition, construction lighting would be temporary and would be removed following the construction period of the proposed project. Therefore, lighting and glare impacts during construction would be **less than significant**.

Operational Impacts

Proposed lighting on the project site would include both indoor and outdoor lighting necessary for safety and security during operation of the proposed project. Specifically, the VMT component of the project would require outdoor lighting to allow 24-hour operations for offloading and loading vessels. It is estimated that up to four vessels would utilize the VMT Phase 1 wharf per month, and an additional 3.5 barges would utilize the VMT Phase 2 rock dike per month. Each vessel would be moored at the wharf for an average of up to 5 to 7 days. During the time that vessels are moored at the facility, 24-hour operations would be conducted for offloading or loading of cargo. Other VMT Terminal operations would be scheduled as two 10-hour shifts per day, 6 days per week. The cargo laydown areas and rail loading areas would require lighting to allow for operations after dark. The Orcem component of the project would require indoor lighting throughout their proposed facilities as well as outdoor lighting to ensure safety and security.

The preliminary lighting plans prepared for the proposed project identify seven 70-foot lighting poles and one 80-foot lighting pole with 78 light-emitting diode (LED) lamps and shielded fixtures providing ground-level illumination levels of up to approximately 75 foot-candles. Overspill of illumination into the water or onto adjoining properties would be minimized by the shielded fixture design and placement.

Light from the project site would be visible from the eastern shore of Mare Island as well as shoreline areas just north and south of the project site. The areas east of the project site would be shielded from the new light sources by the hillside adjacent to the proposed facilities. All lighting proposed on the site would be shielded or designed to prevent off-site glare, and the placement of lighting fixtures would minimize overspill onto water or adjacent areas; however, since the proposed project would involve 24-hour operations that would require extensive lighting for safety and security, these new sources of light and glare could adversely affect views in the project area. Therefore, impacts would be **significant** (Impact 3.1-1) and mitigation is provided in Section 3.1.5 to reduce potential impacts due to lighting.

Off-Site Improvements

As described under Threshold A above, the proposed public access improvements and dock removal would take place at the City of Vallejo Municipal Marina. Construction of the launch ramp would require the temporary use of construction equipment in the water and on land. The introduction of this equipment would not substantially degrade the existing visual character or quality of the area and would be removed following construction. Once installed, the launch ramp would extend 60 feet into the water area between the shoreline and the existing docks. The top of the launch ramp would be approximately 8 feet above MLLW and the bottom of the ramp would be 2 feet below MLLW. The launch ramp would be constructed in an area surrounded by existing docks and marine facilities and would complement the visual character and quality of the Marina.

The project would also involve the removal of existing deteriorated docks within the water area at the north end of the marina as described earlier. Construction equipment would be temporarily located on the site during demolition activities; however, the equipment would be removed following demolition and would not degrade the visual character or quality of the area. Removal of the docks would improve the visual character and quality of the north end of the marina by eliminating the deteriorated portions of the docks that are not in use and restoring the open water area.

Since the off-site improvements would not substantially degrade the visual character or quality of the marina and its surroundings, impacts would be **less than significant**.

3.1.5 Mitigation Measures

Mitigation for Impact 3.1-1: The proposed project would involve 24-hour operations that would require extensive lighting for safety and security, which could adversely affect views in the project area.

MM-3.1-1 Final lighting plans for the VMT and Orcem projects shall be submitted to and reviewed by the City of Vallejo during the Site Development Review process and shall be approved by the City prior to issuance of a building permit. The City shall verify that the final lighting plans include provisions to ensure that outdoor lighting is designed so that potential glare or light spillover to surrounding properties is minimized through appropriate site design and shielding of light standards, consistent with the preliminary plans. The plans shall also demonstrate that the use of reflective exterior materials is minimized and that proposed reflective material would not create additional daytime or nighttime glare. Measures identified in the final lighting plans shall be incorporated into construction plans and implemented by the construction contractor.

3.1.6 Level of Significance After Mitigation

Impact 3.1-1: With implementation of mitigation measure MM-3.1-1, impacts due to lighting and glare during operation of the proposed project would be reduced to a **less-than-significant** level.

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SOURCE:

FIGURE 3.1-1

Photo Location Map

VALLEJO MARINE TERMINAL AND ORCEM PROJECT DRAFT EIR

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Existing View

Visual Simulation - VMT Phase 1

Visual Simulation - VMT Phase 2

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FIGURE 3.1-2

Photo Location 1 - Existing View and Visual Simulations

VALLEJO MARINE TERMINAL AND ORCEM PROJECT DRAFT EIR

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Existing View

Visual Simulation

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FIGURE 3.1-3

Photo Location 2 - Existing View and Visual Simulation

VALLEJO MARINE TERMINAL AND ORCEM PROJECT DRAFT EIR

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Existing View

Visual Simulation

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FIGURE 3.1-4

Photo Location 3 - Existing View and Visual Simulation

VALLEJO MARINE TERMINAL AND ORCEM PROJECT DRAFT EIR

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Existing View

Visual Simulation

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FIGURE 3.1-5

Photo Location 4 - Existing View and Visual Simulation

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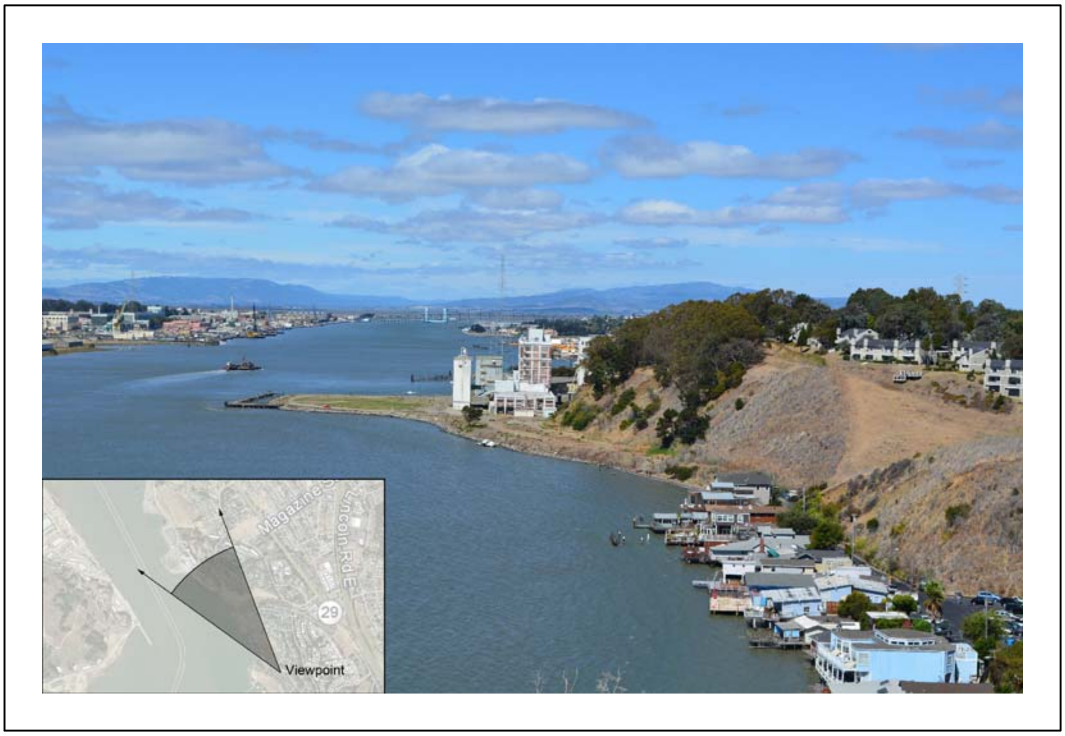
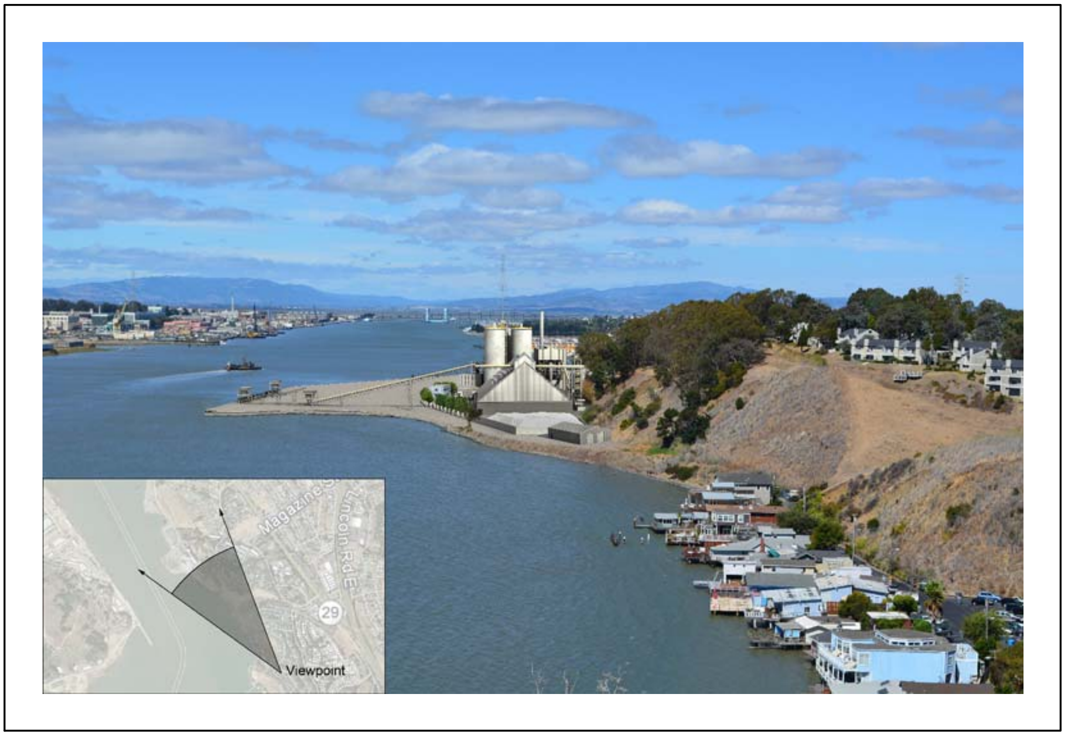


Existing View



Visual Simulation

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FIGURE 3.1-6

Photo Location 5 - Existing View and Visual Simulation

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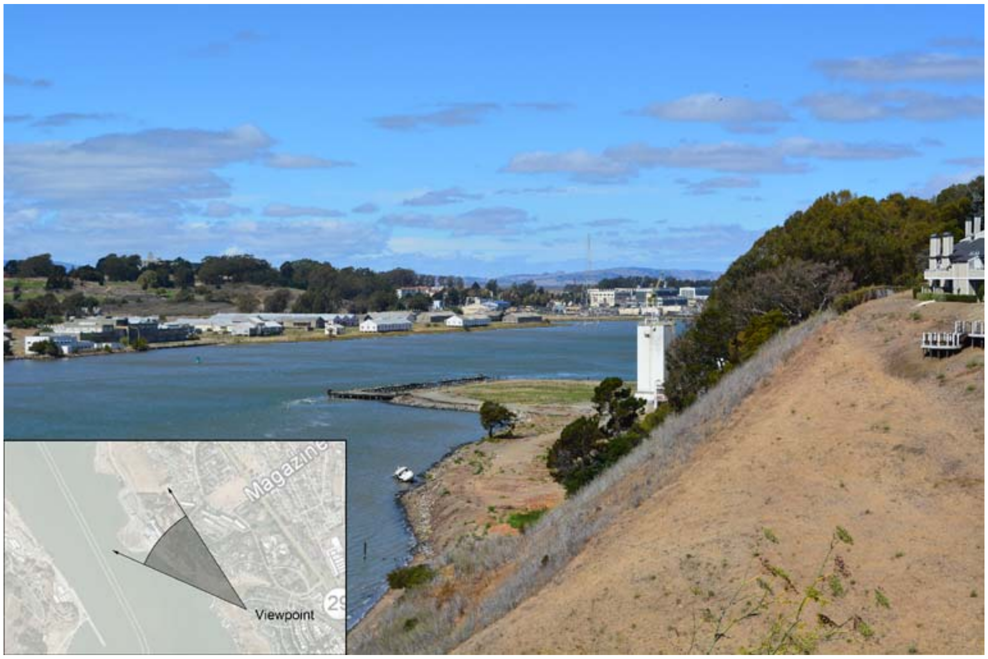
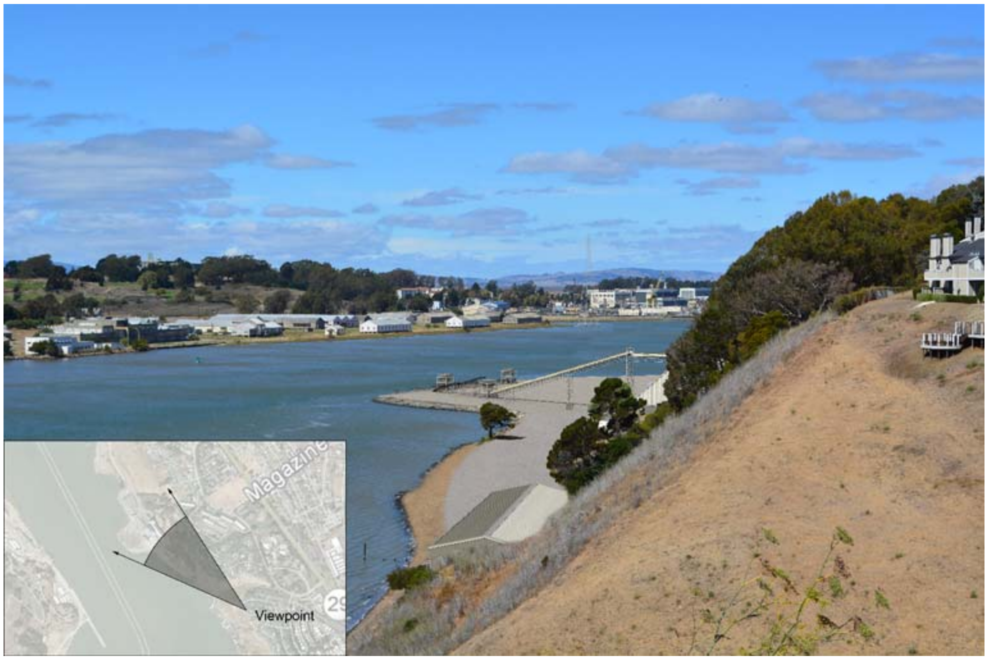


Existing View



Visual Simulation

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FIGURE 3.1-7

Photo Location 6 - Existing View and Visual Simulation

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3.2 AIR QUALITY

This section evaluates the potential construction and operational impacts of the Vallejo Marine Terminal (VMT) and Orcem California Inc. (Orcem) project (proposed project), with respect to air quality impacts, and recommends mitigation measures where necessary to reduce or avoid significant impacts. Information provided in this section was prepared based on technical study prepared for the proposed project, provided as the following appendix:

Appendix D-1: Ramboll Environ. 2015. *Orcem/VMT Project – Air Quality and Greenhouse Gas Evaluation*.

Details regarding methodology, emissions calculations and model outputs can be found in Appendix D-1.

3.2.1 Regulatory Setting

Federal

The federal Clean Air Act (CAA), passed in 1970 and last amended in 1990, forms the basis for the national air pollution control effort. The U.S. Environmental Protection Agency (EPA) is responsible for implementing most aspects of the CAA, including the setting of National Ambient Air Quality Standards (NAAQS) for major air pollutants, hazardous air pollutant standards, approval of state attainment plans, motor vehicle emission standards, stationary source emission standards and permits, acid rain control measures, stratospheric ozone (O_3) protection, and enforcement provisions.

NAAQS are established by the EPA for “criteria pollutants” under the CAA, which are O_3, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM_{10} and $PM_{2.5}$), and lead (Pb).

The NAAQS describe acceptable air quality conditions designed to protect the health and welfare of the citizens of the nation. The Clean Air Act requires the EPA to reassess the NAAQS at least every 5 years to determine whether adopted standards are adequate to protect public health based on current scientific evidence. States with areas that exceed the NAAQS must prepare a State Implementation Plan that demonstrates how those areas will attain the standards within mandated time frames.

State

California Clean Air Act

The California CAA was adopted in 1988 and establishes the state’s air quality goals, planning mechanisms, regulatory strategies, and standards of progress.

Under the federal CAA, the task of air quality management and regulation has been legislatively granted to California Air Resources Board (CARB), with subsidiary responsibilities assigned to air quality management districts and air pollution control districts at the regional and county levels. CARB is responsible for ensuring implementation of the California CAA, responding to the federal CAA, and regulating emissions from motor vehicles and consumer products. Pursuant to the authority granted to it, CARB has established California Ambient Air Quality Standards (CAAQS), which are generally more restrictive than the NAAQS.

The NAAQS and CAAQS are presented in Table 3.2-1, Ambient Air Quality Standards.

Table 3.2-1
Ambient Air Quality Standards

Pollutant	**Averaging Time**	**California Standards**[1]	**National Standards**[2]	
		Concentration[3]	*Primary*[3,4]	*Secondary*[3,5]
O_3	1-hour	0.09 ppm (180 $\mu g/m^3$)	—	Same as Primary Standard
	8-hour	0.070 ppm (137 $\mu g/m^3$)	0.075 ppm (147 $\mu g/m^3$)	
CO	1-hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	—
	8-hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	
NO_2[6]	1-hour	0.18 ppm (339 $\mu g/m^3$)	0.100 ppm (188 $\mu g/m^3$)	Same as Primary Standard
	Annual Arithmetic Mean	0.030 ppm (57 $\mu g/m^3$)	0.053 ppm (100 $\mu g/m^3$)	
SO_2[7]	1-hour	0.25 ppm (655 $\mu g/m^3$)	0.75 ppm (196 $\mu g/m^3$)	—
	3-hour	—	—	0.5 ppm (1300 $\mu g/m^3$)
	24-hour	0.04 ppm (105 $\mu g/m^3$)	0.14 ppm (for certain areas)[7]	
	Annual Arithmetic Mean	—	0.030 ppm (for certain areas)[7]	—
PM_{10}[8]	24-hour	50 $\mu g/m^3$	150 $\mu g/m^3$	Same as Primary Standard
	Annual Arithmetic Mean	20 $\mu g/m^3$	—	
$PM_{2.5}$[8]	24-hour	—	35 $\mu g/m^3$	Same as Primary Standard
	Annual Arithmetic Mean	12 $\mu g/m^3$	12.0 $\mu g/m^3$	15.0 $\mu g/m^3$
Lead[9,10]	30-day Average	1.5 $\mu g/m^3$	—	—
	Calendar Quarter	—	1.5 $\mu g/m^3$ (for certain areas)[10]	Same as Primary Standard
	Rolling 3-Month Average	—	0.15 $\mu g/m^3$	
Hydrogen sulfide	1-hour	0.03 ppm (42 $\mu g/m^3$)	—	—
Vinyl chloride[9]	24-hour	0.01 ppm (26 $\mu g/m^3$)	—	—

Table 3.2-1
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[1]	National Standards[2]	
		Concentration[3]	*Primary*[3,4]	*Secondary*[3,5]
Sulfates	24-hour	25 μg/m^3	—	—
Visibility reducing particles[11]	8-hour (10:00 a.m. to 6:00 p.m. PST)	See footnote 11	—	—

Source: CARB 2013

Notes: ppm= parts per million by volume; μg/m^3 = micrograms per cubic meter; mg/m^3= milligrams per cubic meter.

[1] California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, and particulate matter (PM$_{10}$, PM$_{2.5}$, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQs are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[2] National standards (other than O$_3$, NO$_2$, SO$_2$, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O$_3$ standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For NO$_2$ and SO$_2$, the standard is attained when the 3-year average of the 98th and 99th percentile, respectively, of the daily maximum 1-hour average at each monitor within an area does not exceed the standard. For PM$_{10}$, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 μg/m^3 is equal to or less than one. For PM$_{2.5}$, the 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard.

[3] Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25° Celsius (°C) and a reference pressure of 760 torr.
Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[4] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

[5] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[6] To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national 1-hour standard is in units of parts per billion (ppb). California standards are in units of ppm. To directly compare the national 1-hour standard to the California standards, the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.

[7] On June 2, 2010, a new 1-hour SO$_2$ standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO$_2$ national standards (24-hour and annual) remain in effect until 1 year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

[8] On December 14, 2012, the national annual PM$_{2.5}$ primary standard was lowered from 15 μg/m^3 to 12 μg/m^3. The existing national 24-hour PM$_{2.5}$ standards (primary and secondary) were retained at 35 μg/m^3, as was the annual secondary standard of 15 μg/m^3. The existing 24-hour PM$_{10}$ standards (primary and secondary) of 150 μg/m^3 also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

[9] CARB has identified lead and vinyl chloride as ‘toxic air contaminants’ with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[10] The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 μg/m^3 as a quarterly average) remains in effect until 1 year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

[11] In 1989, CARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are “extinction of 0.23 per kilometer” and “extinction of 0.07 per kilometer” for the statewide and Lake Tahoe Air Basin standards, respectively.

Truck and Bus Regulation — CARB On-Road Heavy Duty Diesel Vehicles (In-Use) Regulation

In April 2014, CARB amended the 2008 Statewide Truck and Bus Regulation to modernize in-use heavy-duty vehicles operating throughout the state. Under this regulation, existing heavy-duty trucks are required to be replaced with trucks meeting the latest NO_x and particulate matter (PM) Best Available Control Technology (BACT) or retrofitted to meet these levels.

Trucks with a gross vehicle weight rating greater than 14,000 pounds and less than 26,000 pounds are required to replace engines with 2010 or new engines, or equivalent, by January 2023. Trucks with a gross vehicle weight rating greater than 26,000 pounds must meet PM BACT and upgrade to a 2010 or new model year emissions equivalent engine pursuant to the compliance schedule set forth by the rule. By January 1, 2023, all model year 2007 class 8 drayage trucks are required to meet NO_x and PM BACT (i.e., EPA 2010 and new standards) (CARB 2014).

Drayage Truck Regulation

CARB adopted the drayage truck regulation in December 2007 to modernize the class 8 drayage truck fleet (trucks with a gross vehicle weight rating greater than 33,000 pounds) in use at California's ports. Emergency vehicles and yard trucks are exempted from this regulation. The regulatory objective is to be achieved in two phases:

1. By December 31, 2009, pre-1994 model year engines were to be retired or replaced with 1994 and newer model-year engines. In addition, all drayage trucks with 1994 to 2003 model-year engines were required to achieve an 85% PM emission reduction through the use of a CARB-approved Level 3 VDEC.
2. By December 31, 2013, all trucks operating at California ports must comply with the 2007 and newer on-road heavy-duty engine standards.

In December 2010, CARB amended the regulation to include Class 7 drayage trucks with gross a vehicle weight rating between 26,000 and 33,001 pounds. The amended regulation required the acceleration of filter replacements to January 1, 2012, for Class 7 trucks in the South Coast Air Basin and required that Class 7 trucks statewide operate with 2007 or newer emission standard engines by January 1, 2014. CARB furthermore expanded the definition of drayage trucks to include dray-offs, those noncompliant trucks that may not directly come to ports to pick up/drop off cargo but that engage in moving cargo destined to or originating from port facilities and to/from near-port facilities or rail yards.

Toxic Air Contaminants

California regulates toxic air contaminants (TACs) primarily through the Tanner Air Toxics Act (Assembly Bill (AB) 1807) and the Air Toxics "Hot Spots" Information and Assessment Act of 1987 (AB 2588). The Tanner Act sets forth a formal procedure for CARB to designate substances as TACs. This includes research, public participation, and scientific peer review before CARB can designate a substance as a TAC. To date, CARB has identified over 21 TACs and has adopted the EPA's list of hazardous air pollutants as TACs. Once a TAC is identified, CARB then adopts an airborne toxics control measure for sources that emit that particular TAC. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If there is no safe threshold, the measure must incorporate best available control technology for toxics to minimize emissions. None of the TACs identified by CARB have a safe threshold.

Under the Air Toxics "Hot Spots" Act, existing facilities that emit air pollutants above specified level were required to (1) prepare a TAC emission inventory plan and report, (2) prepare a risk assessment if TAC emissions were significant, (3) notify the public of significant risk levels, and (4) if health impacts were above specified levels, prepare and implement risk reduction measures.

Diesel Risk Reduction Plan

In August 1998, the CARB identified DPM (i.e., PM from diesel-fueled engines) as a TAC. After identifying DPM as a TAC, CARB adopted a comprehensive Risk Reduction Plan in 2000 (CARB 2000). Pursuant to this plan, CARB adopted diesel-exhaust control measures and stringent emission standards for various on-road mobile sources of emissions, including transit buses and off-road diesel equipment (e.g., tractors, generators). In 2001, CARB adopted the Public Transit Bus Fleet Rule and Emissions Standards for New Urban Buses, which established emissions limits on 1985 and subsequent model year heavy-duty bus engines and vehicles for nitric oxide (NO), CO, non-methane hydrocarbons, PM, and formaldehyde. The emissions standards apply to all heavy-duty urban buses, including diesel-fueled buses. Therefore, the rule limits the emissions of two TACs identified by CARB: DPM and formaldehyde. In 2007, a low-sulfur diesel fuel requirement and tighter emissions standards for heavy-duty diesel trucks were put into effect, followed in 2011 by the same standards being applied to off-road diesel equipment.

Over time, the replacement of older vehicles will result in a fleet that produces substantially lower levels of TACs than the replaced vehicles. Mobile-source emissions of TACs (e.g., benzene, 1,3-butadiene, DPM) decreased significantly over the last decade and will be reduced further in California through a progression of regulatory measures (e.g., low-emission vehicle/clean fuels and Phase II reformulated gasoline regulations) and control technologies. The California Port Regulations for At-Berth Ocean-Going Vessels (approved in 2007) requires operators of vessels meeting specified criteria to turn off auxiliary engines for most of their stay in port. The Commercial Harbor Craft Regulation adopted in November 2007 and amended in June 2011 limits DPM emissions from commercial harbor craft operating within California waters and within 24 nautical miles of the California coast. This regulation sets emission standards for new engines, as well as requirements for replacement or retrofitting of pre-Tier 1 and Tier 1 engines for in-use fleets.

With implementation of CARB's Risk Reduction Plan, DPM concentrations are expected to be reduced by 75% in 2010 and 85% in 2020 from the estimated year-2000 level. As emissions are reduced, it is expected that risks associated with exposure to the emissions will also be reduced.

California Health and Safety Code Section 41700

This section of the Health and Safety Code states that a person shall not discharge from any source whatsoever quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or that endanger the comfort, repose, health, or safety of any of those persons or the public, or that cause, or have a natural tendency to cause, injury or damage to business or property. This section also applies to sources of objectionable odors.

Local

Bay Area Air Quality Management District

The Bay Area Air Quality Management District (BAAQMD) attains and maintains air quality conditions in the San Francisco Bay Area Air Basin (SFBAAB) through a comprehensive program of planning, regulation, and enforcement. The BAAQMD strategy includes the adoption and enforcement of rules and regulations concerning sources of air pollution and the issuing of permits for stationary sources of air pollution.

The BAAQMD also inspects stationary sources of air pollution; monitors ambient air quality; and implements programs and regulations required by the federal CAA, federal CAA Amendments, and the California CAA.

The BAAQMD has prepared the 2010 Clean Air Plan to address nonattainment of the national 1-hour ozone standard in the SFBAAB. The purpose of the plan is to:

- Update the Bay Area 2005 Ozone Strategy in accordance with the requirements of the California Clean Air Act to implement "all feasible measures" to reduce ozone;
- Consider the impacts of ozone control measures on particulate matter (PM), air toxics, and greenhouse gases in a single, integrated plan;
- Review progress in improving air quality in recent years; and
- Establish emission control measures to be adopted or implemented in the 2009–2012 time frame.

The 2010 Clean Air Plan contains 55 control measures aimed at reducing air pollution in the San Francisco Bay Area (Bay Area) including stationary, area, mobile, and transportation control measures. CARB adopted 13 CCR 2299.2, Fuel Sulfur and Other Operational Requirements for Ocean-going Vessels within California Waters and 24 Nautical Miles of the California Baseline, in 2008. The regulation requires the use of low sulfur marine distillate fuels to reduce emissions from the use of auxiliary diesel and diesel-electric main propulsion engines and auxiliary boilers on ocean-going vessels within "Regulated California Waters."

Table 3.2-2 shows the attainment designations for the BAAQMD by pollutant.

Table 3.2-2
BAAQMD Attainment Classification

Pollutant	Federal Designation	State Designation
O_3 (1-hour)	N/A	Nonattainment
O_3 (8-hour – 2008)	Nonattainment	Nonattainment
CO	Attainment	Attainment
PM_{10}	Unclassifiable	Nonattainment
$PM_{2.5}$	Attainment	Nonattainment
NO_2	Unclassifiable/Attainment	Attainment
SO_2	Attainment	Attainment
Lead	Attainment	Attainment

Source: Appendix D-1.

Prevention of Significant Deterioration

The Prevention of Significant Deterioration (PSD) permitting program is a federal CAA initiative for new and modified major sources of air pollution. The definition of "major" under the federal CAA is a facility which emits or has the potential to emit 100 tons per year (tpy) or more of any criteria pollutant for the 28 specific source categories listed in the PSD regulations (including power plants, cement plants, and petroleum refineries). If a facility does not fall under one of the listed source categories, the threshold increases to 250 tpy. The concept of "significance" refers to thresholds assigned to each criteria pollutant and certain non-criteria pollutants.

The BAAQMD has addressed the PSD in their permitting regulations as follows:

1. New Major Facilities (Reg. 2-2-304.1 and 2-2-220):
    a. If the major facility is one of the 28 PSD source categories listed in Section 169 (1) of the Federal Clean Air Act, then SO_2, NO_x, PM_{10}, and CO emissions are significant if greater than or equal to 100 tons per year
    b. If the major facility is not one of the 28 categories listed in Section 169 (1) of the Federal Clean Air Act, then SO_2, NO_x, PM_{10}, and CO emissions are significant if greater or equal to 250 tons per year.

2. Major Modification of a Major Facility (Reg. 2-2-304.2 and 2-2-221). Emissions are significant as defined below:
   a. For SO_2: Net emissions greater than 40 tons/year.
   b. For PM_{10}: Net emissions greater than 15 tons/year.
   c. For NO_x: Emissions calculated as NO2 greater than 40 tons/year.
   d. For CO: Emissions greater than 100 tons/year.
   e. For POC (precursor organic compounds): Net emissions greater than 40 tons/year.
3. Non-Criteria Pollutants (Reg. 2-2-306). If any criteria pollutant is greater than 100 tons/year and any non-criteria pollutant emissions increases minus reductions since December 1, 1982 are in excess of the amounts in Table 3.2-3.

Table 3.2-3
Non-criteria Pollutant Significant Emission Levels

Pollutant	Annual Average (tpy)	Daily Average (lbs/day)
Lead	0.6	3.2
Asbestos	0.007	0.04
Beryllium	0.0004	0.002
Mercury	0.1	0.5
Fluorides	3	16
Sulfuric Acid Mist	7	38
Hydrogen Sulfide	10	55
Total Reduced Sulfur	10	55
Reduced Sulfur Compounds	10	55

Source: Appendix D-1.

The two facilities (Orcem and VMT) entail a port operation at the VMT facility and a ground granulated blast furnace slag (GGBFS) production facility at the Orcem facility and thus would not be categorized as one of the 28 PSD major source categories (40 CFR 52.21(B)(1)(i)); therefore, the PSD threshold for this project, in cumulative, is 250 tpy for each of the PSD regulated pollutants (Appendix D-1).

BAAQMD CARE Program

Air quality and health risk data presented by CARB in the 2009 Almanac of Emissions and Air Quality for the state shows that over the period from 1990 through 2008, the average concentrations for the top 10 TACs have been substantially reduced, and the associated health risks for the state are showing a steady downward trend as well. This same trend is expected to have occurred in areas overseen by the BAAQMD. CARB-estimated emissions inventory values for the top 10 TACs for 2008 are presented in Table 3.2-4 for the Bay Area and the state.

Table 3.2-4
Top Ten Toxic Air Contaminants TAC

	Statewide Year 2008 Emissions (tpy)	BAAQMD Year 2008 Emissions (tpy)	BAAQMD Predicted Cancer Risk, per 106 (2007)
Acetaldehyde	9103	1350	3
Benzene	10794	1634	25
1,3 Butadiene	3754	415	23
Carbon tetrachloride	4.04	2.13	ND
Chromium 6	0.61	0.05	8
Para-Dichlorobenzene	1508	284	ND
Formaldehyde	20951	3138	11
Methylene Chloride	6436	906	<1
Perchloroethylene	4982	788	1
Diesel Particulate Matter	35884	4151	ND

Source: Appendix D-1.
ND = no data

The BAAQMD CARE program was initiated in 2004 to evaluate and reduce health risks associated with exposures to outdoor TACs in the Bay Area. The program examines TAC emissions from point sources, area sources, and on-road and off-road mobile sources co-located with sensitive populations to help focus mitigation strategies. The main objectives of the program are to:

- Characterize and evaluate potential cancer and noncancer health risks associated with exposure to TACs from both stationary and mobile sources throughout the Bay Area.
- Assess potential exposures to sensitive receptors including children, senior citizens, and people with respiratory illnesses.
- Identify significant sources of TAC emissions and prioritize use of resources to reduce TACs in the most highly impacted areas (i.e., priority communities).
- Develop and implement mitigation measures—such as grants, guidelines, or regulations—to achieve cleaner air for the public and the environment, focusing initially on priority communities.

Starting in 2009, the CARE program began also evaluating exposures to fine particulate matter ($PM_{2.5}$) and helping to craft mitigations to reduce these exposures to address the growing evidence that exposure to fine particles has serious health effects.

The project is not located in any of the six CARE program impacted communities or regions.

3.2.2 Existing Conditions

Background Concentrations

BAAQMD operates a regional 32-station monitoring network that measures the ambient concentrations of criteria pollutants. Between 2011–2013, no exceptional event designations were requested by BAAQMD. Therefore, design values listed in Table 3.2-5 have not been adjusted for exceptional events. In the Bay Area, exceptional events would generally be restricted to wildfires or industrial accidents that contribute to exceedances of the NAAQS.

Representative background concentrations for ozone, NO_2, SO_2, CO, O_3, and $PM_{2.5}$ are based on the ambient monitoring station located on Tuolumne Street, Vallejo, California (Station No. 06-095-0004) and covers the three most recent complete years (2011–2013). The station is designated a neighborhood scale station (with a range of 500 meters – 4 kilometers) and is suitable for assigning a background concentration for determining project impacts. The monitoring station is located 2.5 kilometers northeast of the proposed facility. The monitoring station is also located approximately downwind of the facility based on the wind data for both Vallejo and Conoco-Phillips Rodeo meteorological stations and thus should be broadly representative of the location at which the maximum emissions from the facilities will occur. In relation to fugitive emissions from the facilities, the use of the Tuolumne Street station is likely to overestimate the background levels of $PM_{2.5}$ due to the remote nature of the project site relative to the ambient monitoring station. The background data for the relevant pollutants is outlined in Table 3.2-5 for the last 3 years for which data is available.

The Tuolumne Street station ceased collection of PM_{10} data in 2008. As an alternative, the PM_{10} concentrations outlined in the BAAQMD publication “2013 Air Monitoring Network Plan” (BAAQMD 2014) for Solano County, which was based on the measurements conducted at Vacaville (in Yolo-Solano Air Quality Management District) (AQS ID 060953001), have been used in the assessment. In 2013 the daily design value for Vacaville had a concentration of 36 micrograms per cubic meter ($\mu g/m^3$). The first high concentration over the period 2011–2013 was used as background for assessing the CAAQS, while the average concentration over the 3-year period was used as background for assessing against the NAAQS (Appendix D-1).

Table 3.2-5
Ambient Air Quality Data

Pollutant	Averaging Time	2011	2012	2013
O_3	8-hour (ppb)	69	62	68
	1-hour (ppb)	90	85	82

Table 3.2-5
Ambient Air Quality Data

Pollutant	Averaging Time	2011	2012	2013
	4th highest maximum 1-hour concentrations averaged over 3 years (ppb)	61	59	57
PM_{10}	Annual (μg/m^3)	13.76	11.30	12.85
	24-hour (μg/m^3)	35.8	26.0	35.4
	98th percentile of maximum 24-hour concentrations (μg/m^3)	N/A	N/A	N/A
$PM_{2.5}$	Annual (μg/m^3)	10.08	8.96	10.42
	24-hour (μg/m^3)	N/A	N/A	N/A
	98th percentile of maximum 24-hour concentrations (μg/m^3)	31.0	21.4	32.8
NO_2	Annual (ppb)	10.20	9.12	9.85
	1-hour (ppb)	47.4	52.4	49.4
	98th percentile of maximum 1-hour concentrations (ppb)	34.7	32.7	36.5
CO	8-hour (ppm)	2.4	2.2	2.3
	1-hour (ppm)	3.0	2.8	2.8
SO_2	1-hour (ppb)	7.4	14.2	8.1
	24-hour (ppb)	2.6	2.5	2.5
	99th percentile of maximum 24-hour concentrations (ppb)	5.1	3.9	3.3

Sources: Appendix D-1.
Notes: ppb = parts per billion by volume; ppm = parts per million by volume; μg/m^3 = micrograms per cubic meter

Regional Topography, Meteorology, and Climate

The SFBAAB is characterized by complex terrain consisting of coastal mountain ranges, inland valleys, and bays, which distort normal wind flow patterns. The greatest distortion occurs when low-level inversions are present, and the air beneath the inversion flows independently of air above the inversion (Appendix D-1).

The climate is dominated by the strength and location of a semi-permanent, sub-tropical high-pressure cell. During the summer, the Pacific high pressure cell is centered over the northeastern Pacific Ocean resulting in stable meteorological conditions and a steady northwesterly wind flow. The high pressure cell leads to low precipitation levels in summer months. In terms of wind patterns, during summer months, the wind flows from the northwest inland through the Golden Gate and over the lower portions of the San Francisco Peninsula (Appendix D-1).

In the winter, the Pacific high-pressure cell weakens and shifts southward resulting in wind flow offshore, the absence of upwelling, and the occurrence of storms. Weak inversions coupled with moderate winds result in low air pollution potential. In relation to wind patterns, the SFBAAB frequently experiences stormy conditions with moderate to strong winds, as well as periods of stagnation with very light winds. Rainfall levels rise and account for typically 75% of the annual average (Appendix D-1).

The project site is within the Carquinez Straits subregion. In this subregion, the prevailing winds are generally from the west, with high pressure offshore during summer and fall months leading to marine air flowing eastwards through the Carquinez Strait. The wind is generally strongest in the afternoon with speeds of 15–20 miles per hour (mph) common. Summer temperatures peak at around 90° Fahrenheit (°F), with mean temperatures in winter in the high 30s°F (Appendix D-1).

3.2.3 Thresholds of Significance

This section discusses the thresholds of significance used to evaluate impacts of the proposed project construction and operational activities.

California Environmental Quality Act Guidelines Appendix G Thresholds

Appendix G of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.) recommends that air quality impacts be deemed significant if the proposed project would:

A) Conflict with or obstruct implementation of the applicable air quality plan;

B) Violate any air quality standard or contribute substantially to an existing or projected air quality violation;

C) Result in a cumulatively considerable net increase 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);

D) Expose sensitive receptors to substantial pollutant concentrations; or

E) Create objectionable odors affecting a substantial number of people.

Appendix G advises lead agencies to rely on the CEQA significance criteria established by the local air pollution control agency (for the Bay Area, BAAQMD) to determine the significance of a project's air emissions under the Appendix G thresholds.

BAAQMD Thresholds

Consistent with Appendix G, this Environmental Impact Report (EIR) uses the thresholds of significance adopted in the 2010 BAAQMD CEQA Guidelines (BAAQMD 2010a)[1]. The

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[1] The BAAQMD's CEQA Guidelines and thresholds of significance, adopted in June 2010, were challenged in a lawsuit. On March 5, 2012, the Alameda County Superior Court issued a judgment finding that the BAAQMD

BAAQMD significance thresholds are summarized in Table 3.2-6. In general, the BAAQMD significance criteria pollutant (reactive organic gas (ROG), NOx, PM_{10}, $PM_{2.}5$, and CO) thresholds address the first three Appendix G air quality CEQA thresholds. The BAAQMD maintains that these criteria pollutant thresholds are intended to maintain ambient air quality concentrations below state and federal standards and to prevent a cumulatively considerable contribution to regional nonattainment with ambient air quality standards. The TAC thresholds (cancer and noncancer risks) address the fourth Appendix G threshold, and the BAAQMD odors threshold addresses the fifth Appendix G threshold. For the purposes of this EIR, proposed project impacts would be considered significant and would require mitigation if they exceed the significance thresholds in Table 3.2-6.

Table 3.2-6
Thresholds of Significance

Pollutant	Construction Thresholds	Operational Thresholds	
	Average Daily Emissions (lbs/day)	*Average Daily Emissions (lbs/day)*	*Maximum Annual Emissions (tpy)*
ROG	54	54	10
NO_x	54	54	10
PM_{10} (exhaust)	82	82	15
$PM_{2.5}$ (exhaust)	54	54	10
PM_{10}/$PM_{2.5}$ (fugitive dust)	Best Management Practices	None	
Local CO	None	9.0 ppm (8-hour average, 20.0 ppm (1-hour average)	
Risks and Hazards (Individual Project)	Compliance with Qualified Community Risk Reduction Plan or Increased cancer risk of > 10.0 in a million Increased noncancer risk of > 1.0 Hazard Index (Chronic or Acute) Ambient PM2.5 increase > 0.3 µg/m3 annual average Zone of Influence: 1,000-foot radius from property line of source or receptor		
Risks and Hazards (Cumulative)	Compliance with Qualified Community Risk Reduction Plan or Cancer risk of > 100 in a million (from all local sources) Noncancer risk of > 10.0 Hazard Index (chronic, from all local sources) Ambient PM2.5 > 0.8 µg/m3 annual average (from all local sources) Zone of Influence: 1,000-foot radius from property line of source or receptor		

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had failed to comply with CEQA when it adopted the thresholds. The court found that the adoption of the thresholds was a project under CEQA and ordered the BAAQMD to examine whether the thresholds would have a significant impact on the environment under CEQA before recommending their use. The court's decision did not call into question the technical merits of the thresholds. The court issued a writ of mandate ordering the BAAQMD to set aside the thresholds and cease dissemination of them until the BAAQMD had complied with CEQA. In May 2012, the BAAQMD revised the 2010 CEQA Guidelines and removed reference to significance thresholds. Although the BAAQMD cannot, at this time, recommend the 2010 adopted thresholds, the adopted 2012 CEQA Guidance allows lead agencies to reference the BAAQMD's CEQA Thresholds Options and Justification Report developed by BAAQMD staff in 2009, which outlines substantial evidence supporting the thresholds of significance (BAAQMD 2012, BAAQMD 2009).

Table 3.2-6
Thresholds of Significance

Pollutant	Construction Thresholds	Operational Thresholds	
	Average Daily Emissions (lbs/day)	*Average Daily Emissions (lbs/day)*	*Maximum Annual Emissions (tpy)*
Accidental Release of Acutely Hazardous Air Pollutants	None	Storage or use of acutely hazardous material located near receptors or new receptors located near stored or used acutely hazardous materials considered significant	
Odors	None	5 confirmed complaints per year averaged over three years	

Source: BAAQMD 2009; BAAQMD 2010a
Notes: ROG = reactive organic gases; NO_x = oxides of nitrogen; PM_{10} = particulate matter with an aerodynamic resistance diameter of 10 micrometers or less; $PM_{2.5}$ = fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less; CO = carbon monoxide

3.2.4 Impact Discussion

This section presents a summary of the proposed project activities and discusses potential impacts to air quality. A detailed description of the proposed project's construction and operational activities is presented in Chapter 2.0, Project Description.

In summary, the VMT project component would reestablish industrial uses on a portion of the 34.3 acres of the former General Mills plant site (Figure 2-1). VMT construction would involve the removal and replacement of a deteriorated timber wharf with a concrete pile-supported wharf, with a structural concrete deck, associated mooring and fender systems, a laydown area, and trucking and rail connections. VMT construction would require water-based fill and dredging activities and land-based construction activities.

The proposed Orcem facility would include construction of a production plant intended for production of GGBFS, a less polluting replacement for the traditional portland cement material used in many California construction projects. The proposed Orcem project component would involve construction of approximately 73,000 square feet of buildings and equipment, and outdoor storage areas, on a 4.83-acre portion of the former General Mills plant site leased from VMT. Several of the buildings and equipment previously used by General Mills would be demolished.

In summary, VMT would operate as a modern deep-water marine terminal, providing berthing for bulk carrier and break-bulk vessels. Orcem would primarily operate as a GGBFS production facility, although the facility could also be used for production of portland cement.

Anticipated material throughput for both VMT and Orcem would ramp up over time, with the maximum monthly throughput occurring when 160,000 metric tons (MT) of raw material would be shipped in via four vessel calls, 91,900 MT of product would be transported via truck loads, and 68,100 MT of product would be transported via rail cars. It is projected that this maximum scenario will not occur sooner than 2020. Although some VMT cargo may be transported via barge, the Air Quality and Greenhouse Gas Evaluation prepared by Ramboll Environ (Ramboll Environ 2015, provided as Appendix D1) determined that maximum impacts would occur when truck and rail transport is maximized. Accordingly, the air quality impacts were quantified for the maximum potential operating scenario occurring in 2020.

The following project design features and best management practices (BMPs) would be implemented as part of the proposed project:

- BMPs recommended by BAAQMD and listed below would be required during proposed project construction activities. The contractor shall implement the following BMPs that are required of all projects:
    1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
    2. All haul trucks transporting soil, sand, or other loose material off site shall be covered.
    3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
    4. All vehicle speeds on unpaved roads shall be limited to 15 mph.
    5. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
    6. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California Airborne Toxics Control Measure Title 13, Section 2485, of the California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
    7. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
    8. Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

The project would also implement the following project design features to reduce on-site emissions:

PDF-AQ-1: Process plant and material storage buildings—All air in contact with raw material or finished product, such as air from storage buildings, silos, and elevators, is treated by bag filters or other types of filter prior to discharge to the atmosphere, with a not-to-exceed limit value of 2.5 mg/Nm3 (normal cubic meter)(0.0011 grains/dry standard cubic foot (dscf)) PM2.5.

PDF-AQ-2: Truck filling with finished Orcem products—Filling takes place in an enclosed area, isolated from the external environment with air discharged through bag filter to atmosphere, with a not-to-exceed limit of 2.5 mg/Nm3 (0.0011 grains/dscf) PM2.5.

PDF-AQ-3: Railcar filling—Filling of the Orcem products takes place in an enclosed area, isolated from the external environment with air discharged through bag filter to atmosphere, with a not-to-exceed limit of 2.5mg/Nm3 (0.0011 grains/dscf) PM2.5.

PDF-AQ-4: In addition to BAAQMD best management practices related to fugitive dust control, the following measures would be implemented to further reduce potential impacts related to fugitive dust during project operations:

Potential Source of Air Emissions	PDF-AQ-4 Operational Measures to Ensure Impacts are Minimized
Grab crane on ship transfers granulated blast furnace slag (GBFS) to mobile hopper	Watering of material transfer point to ensure adequate moisture content giving a control effectiveness of 95% (SCAMQD 2007).
Hopper drop to conveyor	Watering of material transfer point to ensure adequate moisture content and aspirated hopper discharging through filter giving a control effectiveness of 95% (SCAMQD 2007).
Conveyor drop to conveyor	Watering of material transfer point to ensure adequate moisture content giving a control effectiveness of 95% (SCAMQD 2007).
Conveyor drop to mound in GBFS storage area	Watering of material transfer point to ensure adequate moisture content giving a control effectiveness of 95% (SCAMQD 2007).
Front-end loader excavation of stockpile	Watering of material transfer point to ensure adequate moisture content giving a control effectiveness of 95% (SCAMQD 2007).
Loading of hopper by front-end loader	Watering of material transfer point to ensure adequate moisture content and aspirated hopper discharging through filter giving a control effectiveness of 95% (SCAMQD 2007).
Raw material storage piles	Frequent watering of storage pile and three-sided enclosure for two of the three stockpiling areas giving a control effectiveness of 90% – 97.5% (SCAMQD 2007, EPA AP-42).
Industrial Paved Road (finished product)	Watering three times daily giving a control effectiveness of 80% (SCAMQD 2007).

Source: Appendix D-1

A) *Would the project conflict with or obstruct implementation of the applicable air quality plan?*

The most recent Bay Area ozone plan prepared in response to federal air quality planning requirements is the 2001 Ozone Attainment Plan (BAAQMD 2001). The most recent state ozone plan is the Bay Area 2010 Clean Air Plan, adopted by the Board of Directors in September 2010 (BAAQMD 2010b), which is an update to the Bay Area 2005 Ozone Strategy. Projects are considered consistent with, and would not conflict with or obstruct implementation of, the local air quality management plan if the growth in socioeconomic factors (e.g., population, employment) is consistent with the underlying regional plans used to develop local air quality management plans. Demographic growth forecasts for various socioeconomic categories, developed by the Metropolitan Transportation Commission, the Association of Bay Area Governments, and local and regional agencies were used to estimate future emissions in the 2001 Ozone Attainment Plan and 2010 Clean Air Plan.

The 2010 BAAQMD CEQA Guidelines recommend consideration of the following three questions to determine consistency with the relevant air quality plan:

1. Does the project support the primary goals of the air quality plan?
2. Does the project include applicable control measures from the air quality plan?
3. Does the project disrupt or hinder implementation of any Clean Air Plan control measures?

Regarding question number 1, the primary goals of the Bay Area 2010 Clean Air Plan are to attain air quality standards under the NAAQS and CAAQS, protect public health, and reduce regionally generated GHG emissions. The 2010 Clean Air Plan proposed emission reduction measures that are designed to bring the SFBAAB into attainment of the CAAQS and NAAQS. The attainment strategies in the Clean Air Plan include more stringent standards for new engines and cleanup of existing fleets, including new measures for port trucks, statewide truck fleets, ships traveling and in port, locomotives, and harbor craft that are enforced at the state and federal level on engine manufacturers and petroleum refiners and retailers; as a result, proposed project operation would comply with these control measures. The BAAQMD also adopts Clean Air Plan control measures into the BAAQMD rules and regulations, which are then used to regulate sources of air pollution in the SFBAAB. Therefore, compliance with these requirements would ensure that the proposed project would not obstruct implementation of the Clean Air Plan.

Although the project would not obstruct implementation of the Clean Air Plan, a portion of the site has not been anticipated in the underlying land use and associated land use intensity assumptions used to develop the Clean Air Plan. The entire project site is located within the City of Vallejo's (City's) Planning Area, which includes lands within the City limits and lands outside the City limits but within the City's sphere of influence. Five and a quarter (5.25) acres of the site are located outside the City limits but within the City's sphere of influence. The portion of the project site within the City limits is designated "Employment" in the City's General Plan, and the zoning designation is "Intensive Use." The 5.25 acres located outside the City limits within the unincorporated area of Solano County is currently designated "Open Space-Community Park" in the City's General Plan and does not have a City zoning designation. The 5.25-acre portion of the site is designated "Park and Recreation" in the Solano County General Plan, and the zoning designations are RTC-6 (Residential Traditional Community 6,000 square feet) and CR (Commercial Recreation).

The Intensive Use zoning district is Vallejo's heaviest industrial district. The regulations for this district distinguish between "Permitted Uses" and "Permitted Uses Subject to A Major Use Permit." As detailed in Chapter 16.34 of the City's Municipal Code, "General Industrial Uses" are "Permitted Uses" (Section 16.34.020.C.2), whereas "Heavy Industrial Uses" are permitted upon the issuance of a major use permit (Section 16.34.040.B.1). Municipal Code Section 16.06.530 (Article V) distinguishes between "General" and "Heavy" industrial uses. It classifies "General Industrial Uses" as consisting of "industrial plants engaged in manufacturing, compounding, processing, assembling, packaging, treatment or fabrication of materials and products." It classifies "Heavy Industrial Uses" as "all other plants" or any such plant which "involves the compounding of radioactive materials, petroleum refining or manufacturing of explosives." The proposed project is considered a Heavy Industrial use within the zoning district which requires a major use permit.

The 5.25-acre portion of the project site located outside the City limits, designated "Open Space-Community Park," would be annexed into the City and would be redesignated "Employment" and zoned "Intensive Use." The rezoning of the 5.25 acres has the potential to introduce a more intensive land use and an associated increase in truck travel, deliveries, and materials transport. However, it should be noted that the applicants are only proposing to use 1.99 acres of the 5.25 acres. These 5.25 acres are currently vacant, are within the existing fenced boundary of the project site, and were historically used as a part of the former General Mills industrial site. The 1.99-acre portion of the 5.25 acres to be annexed would be developed with an approximately 6,000-square-foot storage shed. Much of the remaining acreage is on the adjacent hillside and is not usable. However, the vehicle trip generation associated with 5.25 acres of land designated for "Employment" has not been accounted for in the City's General Plan, and therefore the project would be considered inconsistent with the growth projections used to estimate future emissions anticipated in BAAQMD's local air quality plans. As such, the proposed project would conflict with implementation of the 2010 Clean Air Plan; therefore, impacts would be **significant** (**Impact 3.2-1**). However, as noted above, the 5.25 acres is proposed to be used for a storage building only.

The primary purpose of the Clean Air Plan is to assist the SFBAAB to come into attainment of the CAAQS including ozone. As described in Threshold B below, a significant impact would occur due to NO_x emissions during project operations. Although the SFBAAB is currently in attainment for NO_x, NO_x is a precursor to the development of ozone; therefore, an exceedance of the BAAQMD NO_x threshold would conflict with the Clean Air Plan's goal of bringing the SFBAAB into attainment for ozone. Therefore, impacts associated with the proposed project would be **significant** (**Impact 3.2-2**).

Regarding question number 2, the Clean Air Plan includes control measures related to six primary categories: Stationary Source Measures, Mobile Source Measures, Transportation Control Measures, Land Use and Local Impact Measures, Energy and Climate Measures, and Further Study Measures. Many of the control measures in the Clean Air Plan would not apply to the proposed project; however, the project would implement BAAQMD BMPs related to fugitive dust control and project design features PDF-AQ-1 through PDF-AQ-4 as described previously. In addition, with implementation of mitigation measures identified in Section 3.2.5, the project would include applicable control measures from the Clean Air Plan. MM-3.2-1 would ensure truck fleets transporting materials to the site would be model year 2010 or newer to reduce NO_x emissions, which would be consistent with the Clean Air Plan's recommended measures related to Mobile Source Measures including measure MSM B-1—HDV Fleet Modernization and B-2—Low NO_x Retrofits for In-Use Engines. MM-3.2-1 would also require the employment of an air quality specialist to monitor air quality at the project site during facility operations, which would be consistent with measure LUM 6—Enhanced Air Quality Monitoring. MM-3.2-2 would require an increase in or replacement of diesel-powered equipment with either biodiesel, natural gas, or electric-powered equipment. Project operations would also promote measure LUM 1—Goods Movement, through the use of diversified material transport and distribution through a combined use of truck, rail, and vessel transportation modes. MM-3.2-2 would also support the BAAQMD measure LUM 5—Reduce Risk in Impacted Communities by implementing measures to reduce health risk to nearby receptors. However, without mitigation, this impact would be **significant** (**Impact 3.2-3**).

Regarding question number 3, the proposed project would not disrupt or hinder implementation of any control measures delineated in the Clean Air Plan. The project would not hinder implementation of any Stationary Source Measures, Mobile Source Measures, Transportation Control Measures, Land Use and Local Impact Measures, Energy and Climate Measures, or Further Study Measures. Therefore, the project would not conflict with or obstruct implementation of control measures delineated in the Clean Air Plan. Impacts with regard to question number 3 would be **less than significant**.

B) Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation?

The California Emissions Estimator Model (CalEEMod) Version 2013.2.2 was used to estimate emissions from construction and operation of the proposed project. CalEEMod is a statewide computer model developed in cooperation with air districts throughout the state, to quantify criteria pollutant and greenhouse gas (GHG) emissions associated with the construction and operational activities from a variety of land use projects, such as residential, commercial, and industrial facilities. CalEEMod input parameters, such as the proposed project land use type and size, construction schedule, and anticipated construction equipment utilization were based on information provided by the project applicant.

CalEEMod is well suited to the assessment of typical, land-based construction activities, such as on-site construction emissions and off-site vehicle transit. Since proposed construction activities would also use marine sources, namely tugboats, emissions for marine-based activities were computed separately, outside of CalEEMod, using methodology and emission factors published by CARB (Appendix D-1). Marine source emissions were then added to CalEEMod results.

Construction Impacts

VMT Analysis

In summary, Phase 1 of VMT construction would replace the deteriorated timber wharf with a concrete pile supported wharf with structural concrete deck, associated mooring and fender system, and related improvements for deep-water marine transportation operations. This phase of construction would include the following:

- Approximately 10,300 cubic yards (cyd) of fill, the majority of which would be placed within the footprint of the existing wharf.
- Approximately 10,900 cyd of on-site recycled concrete grading material to bring the finished elevation to 11.5 feet above mean lower low water (MLLW) as needed for the proposed stormwater control plan.
- Approximately 89,800 cyd of dredging, to a design depth of -38 feet below MLLW. The dredged material may be reused on site as engineered backfill, or would be transported from the site via barges and associated tugboats and disposed of in a marine disposal site within 3 miles of the project site. Dredging activities would be subject to a permit from the U.S. Army Corps of Engineers.
- Installation of a steel maintenance shed.
- Upgrading and realignment of the existing rail service.
- Demolition of an existing warehouse building and site improvements.

Phase 1 of VMT construction is anticipated to begin in June 2016 and would require 4 to 6 months to complete. VMT Phase 1 would be constructed simultaneously with the Orcem facility.

Phase 2 of VMT construction would construct a rock dike intended for shallower draft vessels, including barge operations. Phase 2 would also include the construction of a rock dike, which would consist of riprap and associated improvements of approximately 600 feet in length north of and adjoining the Phase 1 wharf. This phase of construction would include the following:

- Approximately 15,800 cyd of fill would be transported to the site via barges and associated tugboats.
- Approximately 19,580 cyd of grading fill to bring the laydown area to a finished grade of 11.5 feet above MLLW.
- Approximately 46,500 cyd of dredging to a design depth of 25 to 38 feet below MLLW. The dredged material would be transported from the site via barges and associated tugboats and disposed of in a marine disposal site within 3 miles of the project site.

Phase 2 of the VMT facility would be constructed following the completion of Phase 1. The start of Phase 2 does not currently have a pre-determined commencement date, as construction of this phase would be contingent on future market demand.

Sources of emissions for both construction phases would include: off-road construction equipment exhaust, on-road vehicles exhaust and entrained road dust (i.e., haul trucks, concrete trucks, worker vehicles), exhaust from tugboats used to position dredging barges, fugitive dust associated with site preparation and grading activities, and paving and architectural coating activities. Detailed equipment utilization associated with VMT construction is included in Appendix D-1.

In addition, although construction is not expected to begin until 2016, the construction analysis, which was completed in August 2014, assumed construction would commence in 2015 as well as the simultaneous construction of the Orcem portion of the project, and Phase 1 and Phase 2 construction in sequence. Because construction equipment fleets become cleaner over time, due to regulatory requirements, the analysis of construction emissions based on a 2015 starting year conservatively overestimates 2016 construction impacts.

Average daily emissions, necessary for comparison to BAAQMD thresholds of significance, were computed by dividing the total construction emissions by the number of construction days. Table 3.2-7 shows total and average daily construction emissions of air pollutants (i.e., ROG, NO_x, PM_{10} exhaust, and $PM_{2.5}$ exhaust) during VMT construction.

Table 3.2-7
VMT Construction Emissions

	ROG	NO_x	PM_{10} Exhaust	$PM_{2.5}$ Exhaust
VMT Phase 1				
2015 (CalEEMod)	0.08 ton	0.85 ton	0.04 ton	0.04 ton
2015 (Tug operations)	0.03 ton	0.22 ton	0.01 ton	0.01 ton
Average daily emissions (pounds)[1]	3.5 lbs./day	34.5 lbs./day	1.6 lbs./day	1.6 lbs./day
VMT Phase 2				
2016 (CalEEMod)	0.21 ton	1.70 tons	0.07 ton	0.07 ton
2016 (Tug operations)	0.04 ton	0.31 ton	0.02 ton	0.02 ton
Average daily emissions (pounds)[2]	6.3 lbs./day	50.3 lbs./day	2.3 lbs./day	2.3 lbs./day
BAAQMD Thresholds (pounds per day)	*54*	*54*	*82*	*54*
Exceed Threshold?	**No**	**No**	**No**	**No**

Source: Appendix D-1
Notes;
[1] Assumes 62 work days.
[2] 80 work days

As shown in Table 3.2-7, construction of the VMT project component would not exceed BAAQMD significance thresholds.

In addition to criteria pollutants from equipment exhaust, PM_{10} and $PM_{2.5}$ in the form of fugitive dust would also result from construction activities. Fugitive dust is addressed under Combined VMT and Orcem Construction Impacts.

Orcem Analysis

Development of the Orcem Plant would involve construction and operation of an industrial facility for the production of a high performance, less polluting replacement for the traditional portland cement material used in most California construction projects. In particular, Orcem is proposing to construct and operate a manufacturing plant on the site which would focus primarily on production of GGBFS. However, the Orcem Plant may also produce portland cement from clinker. The Orcem Plant would involve construction of approximately 73,000 square feet of buildings and equipment, together with outdoor storage areas, on a 4.83-acre portion of the former General Mills plant site leased from VMT. Several of the buildings and equipment previously used by General Mills within the Orcem Site would be demolished in order to accommodate construction and operation of the proposed cement products production facility. The project would be constructed in phases to coincide with the growth in demand for Orcem’s products. Orcem would import most of the raw materials used in the proposed plant via the proposed wharf on the adjoining VMT Site.

While the Orcem Plant would be constructed in phases to coincide with the growth in demand for Orcem's products, it is anticipated to be constructed from January 2016 through June 2017. As described in the VMT construction discussion, although Orcem construction is not expected to begin until 2016, the construction analysis, which was completed in August 2014, assumed construction would commence in 2015 as well as the simultaneous construction of the VMT facility. Because construction equipment fleets become cleaner over time, due to regulatory requirements, the analysis of construction emissions based on a 2015 starting year conservatively overestimates 2016 construction impacts.

Sources of emissions would include: off-road construction equipment exhaust, on-road vehicles exhaust and entrained road dust (i.e., haul trucks, concrete trucks, worker vehicles), fugitive dust associated with site preparation and grading activities, and paving and architectural coating activities. Detailed equipment utilization associated with Orcem construction is included in Appendix D-1.

Average daily emissions, necessary for comparison to BAAQMD thresholds of significance, were computed by dividing the total construction emissions by the number of construction days. Table 3.2-8 shows average daily construction emissions of ROG, NO_x, PM_{10} exhaust, and $PM_{2.5}$ exhaust during Orcem construction.

Table 3.2-8
Orcem Construction Emissions

	ROG	**NOx**	**PM_{10} Exhaust**	**$PM_{2.5}$ Exhaust**
2015	0.70 ton	3.34 tons	0.16 ton	0.15 ton
2016	0.23 ton	0.43 ton	0.02 ton	0.02 ton
Average daily emissions (lbs/day)*	4.7 lbs.	19.2 lbs.	0.9 lb.	0.9 lb.
BAAQMD Thresholds (lbs/day)	*54 lbs.*	*54 lbs.*	*82 lbs.*	*54 lbs.*
Exceed Threshold?	**No**	**No**	**No**	**No**

Source: Appendix D-1
Note: * Assumes 392 work days.

As shown in Table 3.2-8, construction of the Orcem Plant would not exceed BAAQMD significance thresholds.

In addition to criteria pollutants from equipment exhaust, PM_{10} and $PM_{2.5}$ in the form of fugitive dust would also result from construction activities. Fugitive dust is addressed under the Combined VMT and Orcem Construction Impacts.

Combined VMT and Orcem Construction Impacts

It is anticipated that Orcem construction would overlap with Phase 1 of VMT construction, which would result in a combined worst-case construction scenario. Table 3.2-9 shows average daily construction emissions of ROG, NOx, PM_{10} exhaust, and $PM_{2.5}$ exhaust during the worst-case, combined construction period.

Table 3.2-9
Combined VMT and Orcem Average Daily Construction Emissions – 2015

	ROG	NOx	PM_{10} Exhaust	$PM_{2.5}$ Exhaust
VMT Phase 1 (lbs/day)	3.5	34.5	1.6	1.6
Orcem (lbs/day)	4.7	19.2	0.9	0.9
Combined Emissions (lbs/day)*	8.2	53.7	2.5	2.5
BAAQMD Thresholds (lbs/day)	*54 lbs.*	*54 lbs.*	*82 lbs.*	*54 lbs.*
Exceed Threshold?	**No**	**No**	**No**	**No**

Source: Appendix D-1
Note: * Assumes 392 work days.

As shown in Table 3.2-9, combined VMT and Orcem construction impacts would not exceed significance thresholds. Impacts during construction would be **less than significant**.

Fugitive Dust

Construction activities, particularly during site preparation and grading, would temporarily generate fugitive dust in the form of PM_{10} and $PM_{2.5}$. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit mud on local streets, which could be an additional source of airborne dust after it dries. Fugitive dust emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. Fugitive dust emissions would also depend on soil moisture, silt content of soil, wind speed, and the amount of equipment operating. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site. The BAAQMD CEQA Air Quality Guidelines consider these impacts to be less than significant if BMPs are employed to reduce these emissions.

Implementation of the BAAQMD BMPs listed below would reduce the air quality and fugitive dust-related impacts associated with grading and new construction to less than significant. The contractor would be required to implement the following BMPs that are required of all projects:

1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
4. All vehicle speeds on unpaved roads shall be limited to 15 mph.
5. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
6. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California Airborne Toxics Control Measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
7. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
8. Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

Implementation of fugitive dust control measures recommended by BAAQMD would ensure air quality and fugitive dust-related impacts associated with grading and new construction would remain **less than significant**.

Operational Impacts

Orcem would import its raw materials (GBFS, Clinker, portland cement, gypsum, limestone and pozzolan) for production via several methods of transport including ocean going vessels which will berth at the VMT Phase 1 wharf. The raw materials would be unloaded and transported to open or covered stockpiles on the site, as appropriate, to fully contain fugitive dust. The raw materials would then be reclaimed from these stockpiles by front end loaders to be transported by conveyors into sealed processing equipment for milling into fine powders (the finished products). The finished products would be transported in sealed convey systems into storage silos, for subsequent loading into truck or rail tankers for distribution to customers in the region. GGBFS is produced by recycling a byproduct, GBFS, from the steel industry. It is used as a partial replacement for traditional cement, also known as portland cement.

The operational phase of the development would include both Orcem and VMT operating their respective areas of the site simultaneously. This section contains a description of the emissions of criteria pollutants and TACs from combined Orcem and VMT operations.

Emissions sources during operation of the facilities would include the following:

- Transportation
    - Port activity (ship exhaust emissions, tug boats, ship loading/unloading)
    - Truck movements both on site and on the local road network
    - Rail activity
    - Barge activity
    - Offroad vehicle movements on site including operation of front end loaders and forklifts
- Material handling emissions generated from stockpiling, unloading of material, material drop points, etc.
- Fugitive dust emissions from hopper and bag filters
- Air emissions from point P-1 (main stack)

The material throughput for both the Orcem and VMT project components would increase over time, as shown in Table 3.2-10. The greatest air quality impacts would result from the activities described in scenario number 3, where the maximum material would be moved through the facilities via trucks and rail. This maximum transportation mode would not occur until at least 2020. Accordingly, the emissions are analyzed for the 2020 year for the shipping scenario where 160,000 MT of material is shipped to the VMT facility monthly via four vessels, and of that, 91,900 MT is transported out of the project site via truck, and 68,100 MT is transported out of the project site by rail. As described in Chapter 2, Project Description, the maximum train size would be 77 cars; however, this analysis evaluates the impacts of 100-car trains, which is a conservative estimate. As described in Chapter 2, the number of rail cars in any given month and week will fluctuate based on the type of product that is being transported from the project site to market, but the average number of rail cars per month is anticipated to be 800 to 1,200 per month, limited to no more than 14,400 project-related rail cars per year.

Table 3.2-10
VMT and Orcem Operational Throughput

Average Monthly Transportation Activity	Ships (#)	Barge (MT/month)	Trucks (MT/month)	Rail (MT/month)	Total (MT/month)
1) Orcem Phase 1 GBFS + VMT Truck Only	2	0	81,700	0	81,700
2) Orcem Phase 2 GBFS + VMT Truck and Rail	3	0	44,000	76,000	120,000
3) Orcem Phase 2 GBFS + VMT Truck and Rail	4	0	91,900	68,100	160,000
4) Orcem Phase 2 GBFS/Clinker + VMT Truck, Rail and Barge	4	48,300	81,200	30,500	160,000
5) Orcem Phase 2 GBFS/Clinker + VMT Truck, Rail and Barge	4	6,600	89,200	64,200	160,000

Source: Appendix D-1

VMT Analysis

The proposed VMT facility would include a multi-phased bulk aggregate import and distribution facility on the existing terminal footprint. The general transportation method would be to unload dry bulk cargo from vessels, temporarily store, and reclaim from storage to cargo trucks and railcars for local and regional distribution. In addition, the terminal design would allow reloading of cargo to barges enabling VMT to engage in short sea shipping initiatives with other California and West Coast ports and terminals. As an operational deep draft facility, the VMT Terminal would handle a wide range of commodities including, but not limited to, the following:

- Feed grains
- Manufactured steel
- Timber/lumber
- Rock, aggregate, ores, and related materials (including GBFS, clinker, and related materials used as part of the Orcem project component)
- Project-based break-bulk Items (e.g., heavy lift transport, large construction assemblies)
- Marine construction materials

Another possible material which may at some future date be imported is pet coke. Pet coke generally has a higher moisture content than sand/aggregate (5%–10%), but has a high silt content and thus would be imported via a sealed system to minimize fugitive dust. If pet coke is imported, it would be treated in a similar fashion as to what is currently planned for clinker imports. The sealed systems with any associated bag filters/release points would achieve an emission concentration of 2.5 mg/Nm^3 (0.0011 grains/dscf) in line with the appropriate BACT limit (Appendix D-1).

For the purposes of a conservative analysis, the materials with the greatest potential for fugitive dust release (sand and aggregates) were assumed to be the dominant material imported. Under these circumstances, sand and aggregates would be received from self-unloading, clam-shell crane-equipped vessels and delivered to the storage area by covered conveyors where they would be stored in open stockpiles. The terminal would be designed to also discharge self-unloading, conveyor-equipped vessels using the same receiving hoppers and conveying equipment when throughput volumes increase.

During the initial project stages, trucks will be loaded using front-end loaders to load cargo directly into the truck trailers. Railcars will ultimately be loaded via a loading station requiring railcar switching, but can be loaded in similar mobile manner as trucks initially. When the annual throughput increases at the VMT Terminal, a railcar loading station and surge bin will be constructed on the site to improve operational efficiency and reduce the use of wheel loaders. Wheel loaders would then be used only in the stockyard to reclaim the cargo to receiving hoppers that feed conveyors leading to the rail loading stations and to maintain the stockpiles. Truck load-out is assumed to remain mobile during both Phase 1 and Phase 2 operations.

VMT would primarily serve as a dry bulk and break-bulk terminal. Cargoes, which are neither dry bulk nor break-bulk and which do not otherwise release fugitive dust or airborne/soluble toxic materials when handled and stored in the open, would be unloaded using portable equipment onto the paved or aggregate surfaces within the 10.5-acre VMT Terminal shipping and receiving site area. All other cargo received or shipped through the VMT Terminal would be handled through enclosed transport devices (such as the GBFS material received and transported directly to the Orcem Site). The existing surfaces at the site would be used as temporary laydown areas for the cargo being prepared for loading onto vessels or being unloaded for transfer to barge, rail, or trucks.

Annual criteria pollutant emissions from VMT operations are presented in Table 3.2-11. The VMT operational analysis reflects operation of the VMT Terminal without barge access; this scenario represents the greatest impacts because it requires the transport of all products from the facility via truck and rail, which would result in greater impacts than barge transport. The emissions analysis is based on detailed calculations, engineering data, and operation at maximum load. Emissions were calculated using industry-accepted sources including CARB's Off-Road Emission Inventory, EMFAC2014, EPA AP-42, and vendor data. Detailed calculations are presented in Appendix D-1. Given that the estimated facility emission totals would be below the PSD threshold of 250 tpy per pollutant, the project would not be subject to PSD review (Appendix D-1).

Table 3.2-11
Maximum Annual Emissions of Criteria Pollutants – VMT Phase 1

Emission Totals (tons/year)								
Source	*ROG*	*CO*	*NO_x*	*SO_2*	*PM_{10} (Exhaust)*	*PM_{10} (Fugitive)*	*$PM_{2.5}$ (Exhaust)*	*$PM_{2.5}$ (Fugitive)*
Shipping	0.99	2.16	18.32	1.22	0.42	—	0.40	—
Barge	—	—	—	—	—	0.15	—	0.02
Material Handling	—	—	—	—	—	0.00	—	0.00
Raw Material Storage Piles	0.04	0.12	0.20	0.00	0.00	0.03	0.00	0.00
Unpaved Road (forklift)	0.11	1.05	0.33	0.01	0.01	0.05	0.01	0.00
Unpaved Road (front loader and excavator)	0.02	0.05	0.19	0.00	0.00	0.03	0.00	0.01
Industrial Paved Road (finished product)	0.20	2.62	10.06	0.03	0.03	4.79	0.03	1.18
Public Paved Road	—	—	—	—	—	—	—	—
Rail	0.02	0.81	2.24	0.00	0.02	—	0.02	—
Total (tpy)	**1.38**	**6.81**	**31.33**	**1.26**	**0.48**	**5.05**	**0.46**	**1.22**
BAAQMD Thresholds	*10*	*N/A*	*10*	*N/A*	*15*	*N/A*	*10*	*N/A*
Exceed Threshold?	*No*	*N/A*	***Yes***	*N/A*	*No*	*No*	*No*	*N/A*

Source: Appendix D-1

As shown in Table 3.2-11, operation of the VMT component of the project would exceed annual thresholds as established by the BAAQMD for NO_x. Project operations would remain below the thresholds for all other criteria pollutants.

Orcem Analysis

The primary raw material utilized at the Orcem Plant would be GBFS, a recycled by-product from the first stage in the production of steel. GBFS has the appearance and handling characteristics of coarse beach sand. At the Orcem Plant, GBFS would be dried and ground to a very fine GGBFS powder (Appendix D-1).

The Orcem Plant would be constructed in phases to coincide with the growth in demand for the products in Orcem's product portfolio. The total annual throughput of raw materials of the plant at full capacity would be up to 900,000 MT per year. A maximum of 760,000 tons can be processed by the grinding mill; the remainder of raw materials would not be milled. It is not expected that the Orcem Plant would achieve full production in the first few years of operation. For this reason it is proposed that minor changes to the basic site infrastructure (but not the main processing plant) will be made in accordance with the growth pattern of production.

The trigger for the proposed infrastructure changes will be the following production phases:

- Orcem Phase 1: Up to a production of 500,000 MT per year.
- Orcem Phase 2: Above 500,000 MT per year.

While the Orcem Plant would primarily produce GGBFS, the plant would also operate in a number of finished product operational modes within any given time frame, based upon market demand for GGBFS and other cement products. These modes may include:

- Orcem Mode 1 – GGBFS production only
- Orcem Mode 2 – Cement products production only
- Orcem Mode 3 – GGBFS production and cement

Details regarding the material production associated with these modes, associated phases, and quantity of materials by phase are provided in Appendix D-1.

Estimates of the annual criteria pollutant emissions from Orcem operations are presented Table 3.2-12. The Orcem operational analysis reflects operation at a maximum production rate of up to 900,000 MT per year of which 760,000 MT per year would be milled. Emissions were calculated using industry-accepted sources including CARB's Ocean Going Vessels (OGV) Marine Emissions Model, CARB's California Harbor Craft Emissions Inventory Database, CARB's OFFROAD2011 off-road equipment inventory, CARB's EMFAC2014 on-road vehicle emissions inventory, EPA AP-42, and vendor data. Detailed calculations are presented in Appendix D-1.

In particular, emissions from the hot air generator, used in the drying process, would be released via a 50-meter stack. Emissions were calculated based on vendor data and default EPA AP-42 emission rates and additional conservative assumptions related to emission variability. In accordance with BAAQMD Regulation 2-2-301, BACT would be triggered if NO_x, SO_2, POC, or non-precursor organic compounds exceed 10 pounds per day. Estimations of emissions indicate that BACT would be required for the hot air generator as outlined in Table 3.2-12 (Appendix D-1).

Given that the estimated facility emission totals would be below the PSD threshold of 250 tons per year per pollutant, the project would not be subject to PSD review (Appendix D-1). Table 3.2-12 show that the largest source of emissions would vary by pollutant, but would generally be driven by trucks, ships, and the main stack. As shown, operation of the Orcem Plant would exceed annual thresholds as established by the BAAQMD for NO_x. Project operations would remain below the threshold for all other criteria pollutants.

Table 3.2-12
Orcem Annual Emissions of Criteria Pollutants (Phase 2)

Emission Totals (tons/year)								
Source	*ROG*	*CO*	*NO_x*	*SO_x*	*PM_{10} (Exhaust)*	*PM_{10} (Fugitive)*	*$PM_{2.5}$ (Exhaust)*	*$PM_{2.5}$ (Fugitive)*
Shipping[1]	0.63	1.41	12.00	0.80	0.28	—	0.26	—
Material Handling	—	—	—	—	—	0.09	—	0.01
Raw Material Storage	—	—	0.55	—	—	0.00	—	0.00
Barge	—	—	—	—	—	—	—	—
Unpaved Road (forklift)	0.01	0.10	0.03	0.00	0.01	—	0.01	—
Unpaved Road (front loader and excavator)[2]	0.20	1.24	0.52	0.01	0.01	0.09	0.01	0.01
Industrial Paved Road (finished product)[2]	0.06	0.07	0.26	0.00	0.00	0.03	0.00	0.01
Public Paved Road[2]	0.36	3.39	12.41	0.04	0.04	5.96	0.04	1.46
Bag Filters	—	—	—	—	—	0.18	—	—
Stack	1.53	11.30	5.59	0.18	0.25	—	0.25	—
Rail	0.01	0.25	0.70	0.00	0.00	—	0.00	—
On site	—	—	—	—	—	—	—	—
Total	**2.80**	**17.76**	**32.06**	**1.03**	**0.59**	**6.35**	**0.57**	**1.50**
BAAQMD Threshold	*10*	*N/A*	*10*	*N/A*	*15*	*N/A*	*10*	*N/A*
Threshold Exceeded?	*No*	*N/A*	*Yes*	*N/A*	*No*	*N/A*	*No*	*N/A*

Source: Appendix D-1
Notes:
[1] Includes all ship and tug emissions.
[2] Includes engine exhaust and fugitive dust emissions.

Combined VMT and Orcem Project Analysis

Table 3.2-13 shows the combined annual emissions from operation of the VMT facility and Orcem Plant. The analysis is based on operation of the VMT facility with truck and rail, but no barge transport and on operation of the Orcem Plant at a maximum throughput of 900,000 MT per year, of which 760,000 would be milled. It is anticipated that this combination of operating scenarios would result in maximum impacts (Appendix D-1).

Table 3.2-13
Maximum Annual Emissions of Criteria Pollutants from the Combined Operations of VMT and Orcem

Combined Annual Emission (tpy)*								
Facility	*ROG*	*CO*	*NO_x*	*SO_x*	*PM_{10} (Exhaust)*	*PM_{10} (Fugitive)*	*$PM_{2.5}$ (Exhaust)*	*$PM_{2.5}$ (Fugitive)*
VMT	1.38	6.81	31.33	1.26	0.48	5.05	0.46	1.22

Table 3.2-13
Maximum Annual Emissions of Criteria Pollutants from the Combined Operations of VMT and Orcem

Combined Annual Emission (tpy)*								
Facility	*ROG*	*CO*	*NO_x*	*SO_x*	*PM_{10} (Exhaust)*	*PM_{10} (Fugitive)*	*$PM_{2.5}$ (Exhaust)*	*$PM_{2.5}$ (Fugitive)*
Orcem	2.80	17.76	32.06	1.03	0.59	6.35	0.57	1.50
Total	**4.18**	**24.57**	**63.39**	**2.29**	**1.07**	**11.4**	**1.03**	**2.72**
BAAQMD Threshold	*10*	*N/A*	*10*	*N/A*	*15*	*N/A*	*10*	*N/A*
Threshold Exceeded?	*No*	*N/A*	*Yes*	*N/A*	*No*	*N/A*	*No*	*N/A*

Source: Appendix D-1
Note:
* BAAQMD annual thresholds are equivalent to average daily thresholds, assuming 365 days/year of operation.

As shown in Table 3.2-13, combined operation of the VMT facility and Orcem Plant would exceed the BAAQMD threshold for NO_x. Combined operational emissions would remain below the threshold for all other criteria pollutants. Impacts related to NO_x during combined operations would be considered **significant (Impact 3.2-4)**.

C) Would the project 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)?

Past, present and future development projects may contribute to the region’s adverse air quality impacts on a cumulative basis. Per BAAQMD’s CEQA Guidelines, by its nature air pollution is largely a cumulative impact; no single project is sufficient in size to, by itself, result in nonattainment of ambient air quality standards. In developing thresholds of significance for air pollutants, BAAQMD considered the emission levels for which a project’s individual emissions would be cumulatively considerable. If a project exceeds the identified significance thresholds, its emissions would be considered cumulatively considerable, resulting in significant adverse air quality impacts to the region’s existing air quality conditions.

Construction Impacts

Potential projects within the proposed project vicinity would include a quick-service restaurant and gas station convenience store, a self-storage facility, and remediation of the Pacific Gas & Electric (PG&E) Southern Waterfront site (former Manufactured Gas Plant facility). Construction of these cumulative projects could potentially occur simultaneously with the proposed project. Emissions associated with construction activities would result in a temporary addition of pollutants to the local airshed caused by soil disturbance and hauling activities, fugitive dust emissions, and combustion pollutants from on-site construction equipment, as well as from off-site trucks hauling construction materials and worker vehicular trips. Fugitive dust (PM_{10} and $PM_{2.5}$) emissions would primarily result from site preparation activities. NO_x and CO emissions would primarily result from the use of construction equipment and motor vehicles, the latter of which would generally be dispersed over a large area where the vehicles are traveling.

Construction of cumulative projects would be short term and temporary in nature. Construction of the quick-service restaurant and gas station convenience store, and self-storage facility would contribute minimal emissions during construction, and would not be anticipated to result in substantial emissions when considered in combination with the proposed project. Construction of the PG&E Southern Waterfront site would consist of demolition of on-site structures, site preparation, and remediation activities. Pollutants generated as a result of these activities would consist primarily of fugitive dust as a result of demolition and site preparation/remediation activities. The PG&E remediation project would include on-site fugitive dust monitoring as part of its demolition work plan and Health and Safety Plan. On-site monitoring would ensure adequate implementation of fugitive dust control measures during dust-generating activities, and would mitigate visible dust plumes and related fugitive dust impacts to a level below significance (Melitta 2015). As fugitive dust impacts are generally localized to individual project sites, and on-site emissions would be sufficiently mitigated through demolition and dust control measures, coupled with implementation of BAAQMD BMPs as listed in Section 3.2.4 for all cumulative projects, cumulative impacts related to fugitive dust would be considered **less than significant**. Additionally, fugitive dust impacts under the proposed project would be less than significant as shown in Table 3.2-13. Moreover, once construction activities are completed, construction-related emissions would cease.

Thresholds established by the BAAQMD as shown in Table 3.2-6 are used to evaluate air quality impacts, including cumulative impacts. Thresholds established by the BAAQMD reflect the attainment status of the project area and provide for the consideration of project impacts in light of the region’s nonattainment status for certain criteria pollutants. As such, these thresholds also provide a basis to evaluate the proposed project’s contribution to air pollutant emissions and concentrations under the cumulative criterion.

Table 3.2-9 shows that construction of the VMT facility and Orcem Plant would not exceed BAAQMD construction thresholds for any criteria pollutants; therefore, construction activities would not contribute to existing cumulatively considerable impacts. Cumulative impacts would be considered **less than significant** during the temporary construction period.

Operational Impacts

The VMT and Orcem facility and a large portion of the marine vessel and motor vehicle trips associated with the import and distribution of materials are located within the SFBAAB. Table

3.2-13 shows that the proposed project would generate operational emissions that would exceed the significance threshold for NO_x. Because the project would exceed the BAAQMD threshold for NO_x, it would, therefore, contribute to cumulative regional air emissions. Additionally, as described in Threshold "A," although the project would not obstruct implementation of the Clean Air Plan (which plans for cumulative regional emission sources to aid the SFBAAB in coming into attainment for the state ozone standard), a portion of the site has not been anticipated in the underlying land use and associated land use intensity assumptions used to develop the Clean Air Plan. The 5.25-acre portion of the project site located outside the City limits, designated "Open Space-Community Park," would be annexed into the City and would be redesignated "Employment" and zoned "Intensive Use." These 5.25 acres are currently vacant, are within the existing fenced boundary of the project site, and were historically part of the former General Mills industrial site. The rezoning of the these 5.25 acres and use of approximately 1.99 acres of this land by the VMT component of the project has the potential to introduce a more intensive land use and an associated increase in truck travel, deliveries, and materials transport. As such, the proposed project would conflict with implementation of the Bay Area 2010 Clean Air Plan and cumulative impacts would, therefore, be considered a significant impact (Impact 3.2-5).

D) Would the project expose sensitive receptors to substantial pollutant concentrations?

The BAAQMD has adopted project and cumulative thresholds for three risk-related air quality indicators to sensitive receptors: cancer risks, noncancer health effects, and increases in ambient air concentrations of $PM_{2.5;}$ these impacts are addressed on a localized rather than regional basis, in relation to sensitive receptors identified in Table 3.2-14. Cancer risk is the probability or chance of contracting cancer over a human life span, conservatively assumed to be 70 years. Carcinogens are assumed to have no threshold below which there would be no human health impact. In other words, any exposure to a carcinogen is assumed to have some probability of causing cancer. Cancer risk is expressed as excess cancer cases per one million exposed individuals, typically over a lifetime of exposure. Non-carcinogenic substances differ in that there is assumed to be a safe level of exposure below which no negative health impact is believed to occur. These levels are determined on a pollutant-by-pollutant basis. Acute and chronic exposure to non-carcinogens is expressed as a hazard index (HI), which is the ratio of expected exposure levels to an acceptable reference exposure levels.

In accordance with BAAQMD guidance, the health risk assessment (HRA) provided in Appendix D-1 evaluated health impacts of project-related TAC and $PM_{2.5}$ emissions. In general, TACs and $PM_{2.5}$ can cause cancer and noncancer chronic and acute health impacts such as birth defects, neurological damage, asthma, bronchitis, or genetic damage; or short-term acute affects such as eye watering, respiratory irritation (a cough), running nose, throat pain, and headaches.

Because many of the project-related emission sources would be diesel-powered, DPM, classified as a TAC by CARB, is a key pollutant evaluated in the HRA. $PM_{2.5}$ emissions from diesel engine combustion were used as a surrogate for DPM. Ship boiler emissions were speciated into their individual TAC components using speciation data in Appendix D-1. Fugitive TAC emissions, associated with the storage, handling, and processing of GBFS and gypsum, were also speciated into their individual TAC components using speciation data in Appendix D-1. The proposed project includes the use of 20% biodiesel blend in all on-site equipment.

Air quality modeling of annual average DPM and fugitive $PM_{2.5}$ concentrations was conducted using the EPA's atmospheric dispersion modeling system (AERMOD). The AERMOD model is a steady-state, multiple-source, dispersion model designed to calculate pollutant concentrations from single or multiple sources. The model is recommended by BAAQMD for predicting air pollutant/contaminant concentrations associated with various emissions sources. See Appendix D-1 for details regarding model input parameters.

Construction Impacts

Construction equipment, dredging activities, and associated heavy-duty truck traffic would generate diesel exhaust, which is a known TAC. Diesel exhaust may pose a health concern to nearby sensitive receptors.

Sensitive receptors are defined as groups of individuals that may be more susceptible to health risks due to chemical exposure. Residences, schools, day care facilities, convalescent homes, and hospitals are of particular concern. In addition to residences, there were a number of sensitive receptors identified within an approximate 2.5-mile radius of the site. These receptors are noted in Table 3.2-14.

Table 3.2-14
Sensitive Receptors Within 2.5 Miles of the Project

Receptor ID	Receptor Type	Receptor ID	UTM Coordinates (E/N)	Distance (miles)
1	School	Grace Patterson Elementary School	566878, 4214937	0.36
2	School	Touro University	564493, 4215574	1.10
3	School	Glen Cove Elementary School	569365, 4214485	2.0
4	School	Beverly Hills Elementary School	568008, 4215793	1.24
5	School	St. Patrick High School	569974, 4215797	2.3
6	School	Annie Pennycook Elementary School	569251, 4216011	1.4
7	Daycare facility	Village Childcare	569207, 4216011	2.3
8	School	Mare Island Academy	563474, 4215422	1.8
9	School	John Swett High School	568280, 4211942	2.3
10	School	Cal Maritime Academy	567463, 4213715	1.3

Table 3.2-14
Sensitive Receptors Within 2.5 Miles of the Project

Receptor ID	Receptor Type	Receptor ID	UTM Coordinates (E/N)	Distance (miles)
11	School	Reignierd School	566142, 4218726	2.3
12	School	Cave Elementary School	567736, 4218848	2.5
13	School	St. Basils School	566881, 4218709	2.3
14	Convalescent home	Genesis Home Care	568897, 4215861	1.59
15	Medical facility	Mare Island VA Hospital	562359, 4217056	2.78
16	Daycare facility	Benecia Kinder Care	570897, 4215220	2.8

Source: Appendix D-1
Notes:
All coordinates from Google Earth (approximate center point of each receptor location), image date 2014.
Based on a 2.5-mile-radius area search. The nearest school is located approximately 0.36 mile east of the site. All other schools are located in excess of 1 mile from the site.
See Appendix D-1 for location of sensitive receptors.

An HRA of the project construction activities evaluated the potential health effects on sensitive receptors from construction emissions of diesel particulate matter (DPM). A dispersion model was used to predict the off-site DPM and $PM_{2.5}$ concentrations resulting from project construction. Resulting concentrations were used to evaluate cancer risks and noncancer impacts (Appendix D-1).

The HRA focused on modeling on-site construction activity using construction fleet information included in the project design features. As described previously, construction period emissions were modeled using CalEEMod based on projected construction activity. The number and types of construction equipment and diesel vehicles, along with the anticipated equipment utilization were based on site-specific construction activity schedules provided by the project proponent.

The CalEEMod model provided total annual $PM_{2.5}$ exhaust emissions (assumed to be DPM) for the off-road construction equipment and for exhaust emissions from on-road vehicles (haul trucks, vendor trucks, and worker vehicles). The on-road emissions are a result of haul truck travel, worker travel, and vendor deliveries during building demolition, grading, and construction activities. A trip length of 0.65 mile was used to represent vehicle travel while at or near the construction site. Fugitive $PM_{2.5}$ dust emissions were also calculated by CalEEMod (Appendix D-1). Table 3.2-15 provides the emissions of exhaust and fugitive $PM_{2.5}$. Tugboat emissions were calculated outside of CalEEMod, using CARB emissions factors and methodology, and added to the CalEEMod calculations.

Table 3.2-15
On-Site and Near-Site Construction DPM and $PM_{2.5}$ Emissions

Year	$PM_{2.5}$ Exhaust (DPM) (tons)	$PM_{2.5}$ Fugitive (tons)
Orcem		
2015*	0.1431	0.0800
2016*	0.0209	0.0004
VMT Phase 1		
2015*	0.0403	0.0024
2015 (Tug operations)	0.01	0.00
VMT Phase 2		
2016*	0.0668	0.0013
2016 (Tug operations)	0.02	0.0

Source: Appendix D-1
* Emissions estimated using CalEEMod.

Construction activity is anticipated to involve demolition of the existing on-site buildings and building construction. As discussed earlier, both the Orcem and VMT facility would have less-than-significant construction-related emissions. While those thresholds primarily address the potential for emissions to adversely affect regional air quality, localized emissions of dust or equipment exhaust could affect nearby sensitive land uses.

Predicted Cancer Risk and Hazards

The maximally exposed residential receptor is shown on Figures 3.2-1 and 3.2-2. Increased cancer risks were calculated using the modeled concentrations and BAAQMD recommended risk assessment methods for both a child exposure (third trimester through 2 years of age) and adult exposure. Since the modeling was conducted under the conservative assumption that emissions occurred daily for a full year during each construction year, the default BAAQMD exposure period of 350 days per year was used.

Results of this assessment indicate that for project construction, the incremental child cancer risk at the maximally exposed individual receptor would be 5.7 in one million, and the adult incremental cancer risk would be 0.3 in one million.

The maximum annual $PM_{2.5}$ concentration was 0.08 microgram per cubic meter ($\mu g/m^3$) occurring at the same location where maximum cancer risk would occur. This $PM_{2.5}$ concentration is below the BAAQMD threshold of 0.3 $\mu g/m^3$ used to indicate the significance of health impacts from $PM_{2.5}$.

Potential noncancer health effects due to chronic exposure to DPM were also evaluated. The chronic inhalation reference exposure level (REL) for DPM is 5 $\mu g/m^3$. The maximum predicted annual DPM concentration was 0.043 $\mu g/m^3$, which is much lower than the REL. The HI, which is the ratio of the annual DPM concentration to the REL, is 0.009. This HI is much lower than the BAAQMD significance criterion of a HI greater than 1.0 (Appendix D-1). Therefore, construction impacts would be **less than significant**.

Operational Impacts

Local Carbon Monoxide Concentrations

The BAAQMD Thresholds of Significance for local CO emissions is the 1-hour and 8-hour CAAQS of 20.0 parts per million (ppm) and 9.0 ppm, respectively. By definition, these represent levels that are protective of public health. If a project would cause local emissions of CO to exceed any of the thresholds listed below, the proposed project would result in a significant impact to air quality.

Because CO impacts have been historically related to automobile idling at intersections, the BAAQMD CEQA Guidelines contain a preliminary screening methodology that provides a conservative indication of whether the implementation of the proposed project would result in CO emissions that exceed the Thresholds of Significance based on automobile traffic at intersections.

According to the BAAQMD CEQA Guidelines (May 2011), a proposed project would result in a less-than-significant impact to localized CO concentrations if the following screening criteria is met:

1. Project is consistent with an applicable congestion management program established by the county congestion management agency for designated roads or highways, regional transportation plan, and local congestion management agency plans.
2. The project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour.
3. The project traffic would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, bridge underpass, natural or urban street canyon, below-grade roadway).

The project is consistent with the local congestion management program. In addition, as is seen in Section 3.12, Transportation and Traffic, there are no intersections or grade crossings affected by the project with a maximum hourly traffic volume of 24,000 vehicles per hour. Therefore, the CO impacts from project traffic would be less than significant.

For this project, CO emissions would result from the project's stationary source, rail traffic, truck traffic, on-site mobile equipment, and ship traffic. The CO impacts from truck and rail traffic are expected to be low because both truck and rail traffic emissions are stringently controlled.

BAAQMD screening thresholds for on-road CO concentrations are based on traffic volume at intersections; no intersections near the project exceed the threshold as a result of the project. The impact from vessels hoteling at the VMT terminal, and the stationary source equipment have the greatest potential to result in off-site impacts of CO (Appendix D-1).

Accordingly, the CO impact evaluation was conducted assuming that a single ocean-going vessel is docked, and, for the 1-hour standard, the main and auxiliary engine are operating. For the 8-hour standard, it is assumed that the auxiliary engine is operating for the entire 8-hour period. Otherwise, long-term emissions estimates are used to estimate the potential for short-term CO exceedances. The results of that evaluation are shown in Table 3.2-16.

Table 3.2-16
Local Carbon Monoxide Emissions

CAAQS Averaging Time	Threshold Concentration (ppm)	Estimated Concentration (ppm)
1-hour	20	7
8-hour	9.0	4

Source: Appendix D-1

As shown in Table 3.2-16, maximum off-site concentration of CO is below the BAAQMD significance thresholds, and impacts would be less than significant. Details regarding the evaluation conducted to estimate the maximum CO concentrations is provided in Appendix D-1.

Cancer Risks and Hazards

The operational HRA was conducted incorporating dispersion modeling consistent with BAAQMD Guidelines and HRA methods consistent with Office of Environmental Health Hazard Assessment methods as adopted by the BAAQMD.[2] The results of that HRA are presented in Table 3.2-17. The largest contributing sources to health risks include ship auxiliary engines, on-site equipment such as front-end loaders, and trucks (Appendix D-1).

Table 3.2-17
Project Health Risks Impacts

BAAQMD Threshold	Threshold	Units	Estimated Value (unmitigated)	Threshold Exceeded?
Project Cancer Risk	10.0	In one million	13.3	Yes (unmitigated)
Project Noncancer Risk	1.0	Unitless	0.01	No

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[2] In March 2015, the Office of Environmental Health Hazard Assessment promulgated new guidance for Health Risk Assessments. The BAAQMD has not yet fully adopted the new guidance. This analysis was conducted in accordance with the current BAAQMD recommendations.

Table 3.2-17
Project Health Risks Impacts

BAAQMD Threshold	Threshold	Units	Estimated Value (unmitigated)	Threshold Exceeded?
Project Noncancer Risk Chronic Hazard Index	1.0	Unitless	0.1	No
Project $PM_{2.5}$ Concentrations	0.3	µg/m3	0.13	No

Source: Appendix D-1

As shown in Table 3.2-17, proposed project operations would exceed the threshold for cancer risk. Impacts would therefore be **significant (Impact 3.2-6)**. The risks were calculated at maximum operation (as determined by the number of vessel calls) with no additional mitigation beyond the use of a 20% biodiesel blend for all diesel operated equipment. It should be noted that the proposed project cancer risk would not reach the level of significance of 10.0 in one million until the average number of ship calls exceeds 28 ships per year (assuming 19 Orcem vessel calls and the remainder VMT ship calls).

Cumulative Risks and Hazards

According to the BAAQMD's adopted Guidelines (BAAQMD 2012), for evaluating cumulative risks, permitted stationary sources of TACs near the project site were identified using BAAQMD's *Stationary Source Risk and Hazard Analysis Tool* for sources in Napa and Solano Counties. This mapping tool uses Google Earth to identify the location of stationary sources and their estimated screening level cancer risk and hazard impacts. Three stationary sources within a 0.5-mile radius of the project site were identified:

Plant G10729 is the Discount Gas Grocery and Liquor located at 605 Magazine Street, approximately 1,300 feet northeast of the project boundary. This gas station has a cancer risk value of 4.02, a hazard value of 0.004, and no $PM_{2.5}$ value associated with it.

Plant 16677 is Original Display Fixtures located at 206 Lemon Street, about 600 feet northwest of the Project boundary. There are no cancer risk, hazard, or $PM_{2.5}$ values associated with this source.

Plant 17907 is the Sousa Solano Auto Body and Paint shop located at 407 Lemon Street, about 970 feet north of the project boundary. There are no cancer risk, hazard, or $PM_{2.5}$ values associated with this source.

It is assumed that both Plants 16677 and 17907 would not contribute to cumulative risks or hazards. For Plant G10729, it is unlikely that the gas station would significantly contribute to any significant cumulative cancer risk or hazard when combined with the proposed project's cancer risks and hazards since the BAAQMD Thresholds for significant cumulative risk, shown in

Table 3.2-18, are a cancer risk of greater than 100 in one million and a hazard index of greater than 10.0 for all local sources combined.

Table 3.2-18
Cumulative Health Risks

BAAQMD Threshold	Threshold	Units	Estimated Value (unmitigated)	Threshold Exceeded?
Cumulative Cancer Risk	100	In one million	17	No
Cumulative Noncancer Risk Chronic Hazard Index	10.0	Unitless	0.1	No
Cumulative PM2.5 Concentrations	0.8	µg/m3	0.13	No

Source: Appendix D-1

As shown in Table 3.2-18, the proposed project would both be in compliance with the BAAQMD's adopted Thresholds for Single Source and Cumulative community risks, as well as hazard index risks. The proposed project would have a **less-than-significant** cumulative health risk impact.

E) Would the project create objectionable odors affecting a substantial number of people?

Construction Impacts

Construction of the proposed project would increase air pollutants due to the combustion of diesel fuel. Some individuals may sense that emissions from the combustion of diesel fuel have an objectionable odor, although it is difficult to quantify the odorous impacts of these temporary and intermittent emissions to the public. The application of architectural coatings and the paving of parts of the site with asphalt also would have the potential to cause odors; however, these odors would be temporary and not likely to be noticeable for extended periods of time much beyond the project's site boundaries.

Therefore, impacts associated with odors during construction would be considered **less than significant**.

Operational Impacts

Operation of the proposed project would increase air pollutants due to the combustion of diesel fuel and processing of GBFS. Some individuals may sense that emissions from the combustion of diesel fuel have an objectionable odor, although it is difficult to quantify the odorous impacts of these emissions to the public. The mobile and intermittent nature of the project emission sources (i.e., ships, trucks, rail) would help to disperse the emissions. The processing of GBFS would be contained within the mill and filter buildings and would not involve the use of heavily odorous materials. Emissions from offloading and storage activities would be minimal due to the installation of BACT on these sources.

Additionally, the distance between project emission sources and the nearest receptor, Grace Patterson Elementary School approximately 0.36 mile away, should be far enough to allow for adequate dispersion of these emissions to less-than-significant odor levels.

The BAAQMD does not have an adopted odor threshold for operational activities, but does recommend screening criteria based on distance between types of sources known to generate odor and the receptor. For projects outside the screening distance, and with no known potential odor sources, no additional analysis is required. For projects within the screening distances, the BAAQMD uses the following threshold for project operations:

> An odor source with five (5) or more confirmed complaints per year averaged over three years is considered to have a significant impact on receptors within the screening distance shown in the Bay Area Air Quality Management District's guidance, Table 3.3.

The BAAQMD 2010 Guidelines identify wastewater treatment plants, oil refineries, or other types of asphalt plants, chemical manufacturing, painting/coating operations, coffee roasters, food processing facilities, recycling operations, and metal smelters as odor sources that could potentially be located in heavy industrial land uses. The proposed project would not include any of these operations. Impacts associated with odors during operation would be **less than significant**.

3.2.5 Mitigation Measures

Mitigation for Impacts 3.2-1 and 3.2-5: The proposed rezoning of the 5.25-acre portion of the project site has the potential to introduce a more intensive land use to the property, and this potential change was not taken into account in the most recent state ozone plan—the Bay Area 2010 Clean Air Plan, adopted by the Board of Directors in September 2010 (BAAQMD 2010b). This would result in project-specific and cumulative impacts.

This impact could potentially be mitigated by establishing a recordation of a deed restriction or covenant that prohibits future development of the hillside on Parcel 3 (the 5.25-acre portion of the site), which is proposed for annexation. The deed restriction would run with the land and be binding on future successors or owners of the site. The purpose of the restriction would be to provide a landscape buffer to the neighboring residential uses. Routine maintenance of the area would be required and the applicants would be required to replace or trim trees and landscape elements as necessary to maintain a buffer. This area would extend from the western property boundary to the toe of the slope. The proposed deed restriction or covenant would be submitted to the City for review and approval prior to recordation.

The applicants have determined that implementation of this mitigation would be economically infeasible. Therefore, there is no feasible mitigation available to reduce Impacts 3.2-1 and 3.2-5.

Mitigation for Impacts 3.2-2 and 3.2-4: The Orcem Plant and VMT facility individually, as well as the combined impact of the two facilities together, would exceed the BAAQMD CEQA levels of significance for NO_x during operations. Unmitigated NO_x emissions from the combined project scenario (without NOx offsets provided as a result of obtaining BAAQMD Permits) would be up to 63.39 tons per year (tpy), consisting of ships, trucks, rail, and heavy equipment operation. This is above the BAAQMD threshold of 10 tpy of NO_x. Emissions would be roughly proportional to the number of vessels arriving at the combined terminal, and a total of 48 vessels per year are expected at maximum operations. However, under the proposed project, the Orcem component would receive a permit from the BAAQMD, and therefore application of offsets to Orcem’s contributions to NOx emissions, resulting in a net reduction of combined project emissions from 63.39 to 31.33 tpy (the amount of the remaining VMT emissions). Accordingly, further mitigation of NOx emissions from the project would not be needed to avoid exceeding the 10 tpy threshold until 15 vessels or more annually arrive at the project site.

MM-3.2-1 After the calendar year at which 15 vessels arrive at the site, the project operators for the VMT facility and Orcem Plant shall retain a qualified air quality specialist to calculate and report annual emissions from trucks and on-site equipment to confirm that emissions are below 10 tons per year. This report shall be submitted to the City of Vallejo for review. At the time emissions exceed 10 tons per year, the project operators shall ensure that at least 75% of the trucks entering the site are model year 2010 or later. This measure shall be enforced until year 2023, when the Drayage Truck Regulation adopted by the California Air Resources Board will require 100% of trucks to be model year 2010 or newer.

Mitigation for Impact 3.2-3: The proposed project would not include the applicable control measures from the Clean Air Plan. Refer to **MM-3.2-1** and **MM-3.2-2.**

Mitigation for Impact 3.2-6: The combined project operations would exceed the BAAQMD threshold for cancer risk. Mitigation Measure MM-3.2-2 would be implemented in order to maintain consistency with BAAQMD adopted thresholds for cancer risk.

MM-3.2-2 Mitigated cancer risk for various scenarios are presented in Table 3.2-19, along with the maximum average vessel calls per year allowable under each scenario before additional mitigation is required. Mitigation measures in Table 3.2-19 are intended to allow a choice of technologies based on the most cost-effective measures available at the time of implementation.

Table 3.2-19
MM-3.2-2

Measures	Maximum Residential Cancer Risk at Full Capacity of 48 Ships (in one million)	Maximum number of ship calls for a Less-Than-Significant Impact	Mitigated Residential Cancer Risk at Maximum Ship Calls (in one million)
At least 20% biodiesel in all on-site equipment (base case)	13.34	28	9.92
100% biodiesel in conveyors and hoppers; at least 20% biodiesel in all other on-site equipment	11.96	36	9.91
At least 20% biodiesel in all equipment, with Orcem compressed natural gas front-end loaders	10.17	47	9.995
At least 20% biodiesel in all equipment, with Orcem and VMT compressed natural gas front-end loaders	9.39	48 (full capacity)	9.39
100% biodiesel in conveyors and hoppers, at least 20% biodiesel in forklift and VMT front-end loaders, Orcem compressed natural gas front end loaders	9.74	48 (full capacity)	9.74

Source: Appendix D-1

Note: Due to the relative contributions from different sources (on-site equipment, ship hoteling, trucks, etc.), the location of the maximally exposed individual may vary with the number of ship calls and mitigation measures. The values presented here represent the maximum residential risk for each scenario.

Emissions associated with mitigated equipment scale with the number of vessel calls, depending on whether Orcem or VMT operate the equipment. For example, in the mitigation scenarios evaluated in Table 3.2-19, only the number of VMT vessel calls is adjusted, thus only diesel emissions from VMT equipment are affected.

In addition to MM-3.2-1 and MM-3.2-2, the following project design features that were previously outlined in this section would be implemented to ensure fugitive dust measures are implemented during project operation:

PDF-AQ-1: Process plant and material storage buildings—All air in contact with raw material or finished product, such as air from storage buildings, silos, and elevators, is treated by bag filters or other types of filter prior to discharge to the atmosphere, with a not to exceed limit value of 2.5 mg/Nm3 (0.0011 grains/dry standard cubic foot (dscf)) PM2.5.

PDF-AQ-2: Truck filling with finished product—Filling of the Orcem component finished products takes place in an enclosed area using tanker trucks, isolated from the external environment with air discharged through bag filter to atmosphere, with a not to exceed limit of 2.5 mg/Nm3 (0.0011 grains/dscf) PM2.5.

PDF-AQ-3: Railcar filling—Filling of the Orcem component finished products takes place using rail tanker cars in an enclosed area, isolated from the external environment with air discharged through bag filter to atmosphere, with a not to exceed limit of 2.5mg/Nm3 (0.0011 grains/dscf) PM2.5.

PDF-AQ-4: In addition to BAAQMD best management practices related to fugitive dust control, the following measures are required to be implemented to further reduce potential impacts related to fugitive dust during project operations:

Potential Source of Air Emissions	PDF-AQ-4: Operational Measures to Ensure Impacts are Minimized
Grab crane on ship transfers GBFS to mobile hopper	Watering of material transfer point to ensure adequate moisture content giving a control effectiveness of 95% (SCAMQD 2007).
Hopper drop to conveyor	Watering of material transfer point to ensure adequate moisture content and aspirated hopper discharging through filter giving a control effectiveness of 95% (SCAMQD 2007).
Conveyor drop to conveyor	Watering of material transfer point to ensure adequate moisture content giving a control effectiveness of 95% (SCAMQD 2007).
Conveyor drop to mound in GBFS storage area	Watering of material transfer point to ensure adequate moisture content giving a control effectiveness of 95% (SCAMQD 2007).
Front loader excavation of stockpile	Watering of material transfer point to ensure adequate moisture content giving a control effectiveness of 95% (SCAMQD 2007).
Loading of hopper by front loader	Watering of material transfer point to ensure adequate moisture content and aspirated hopper discharging through filter giving a control effectiveness of 95% (SCAMQD 2007).
Raw material storage piles	Frequent watering of storage pile and three-sided enclosure for two of the three stockpiling areas giving a control effectiveness of 90% – 97.5% (SCAMQD 2007, EPA AP-42).
Industrial Paved Road (finished product)	Watering three times daily giving a control effectiveness of 80% (SCAMQD 2007).

Source: Appendix D-1

3.2.6 Level of Significance After Mitigation

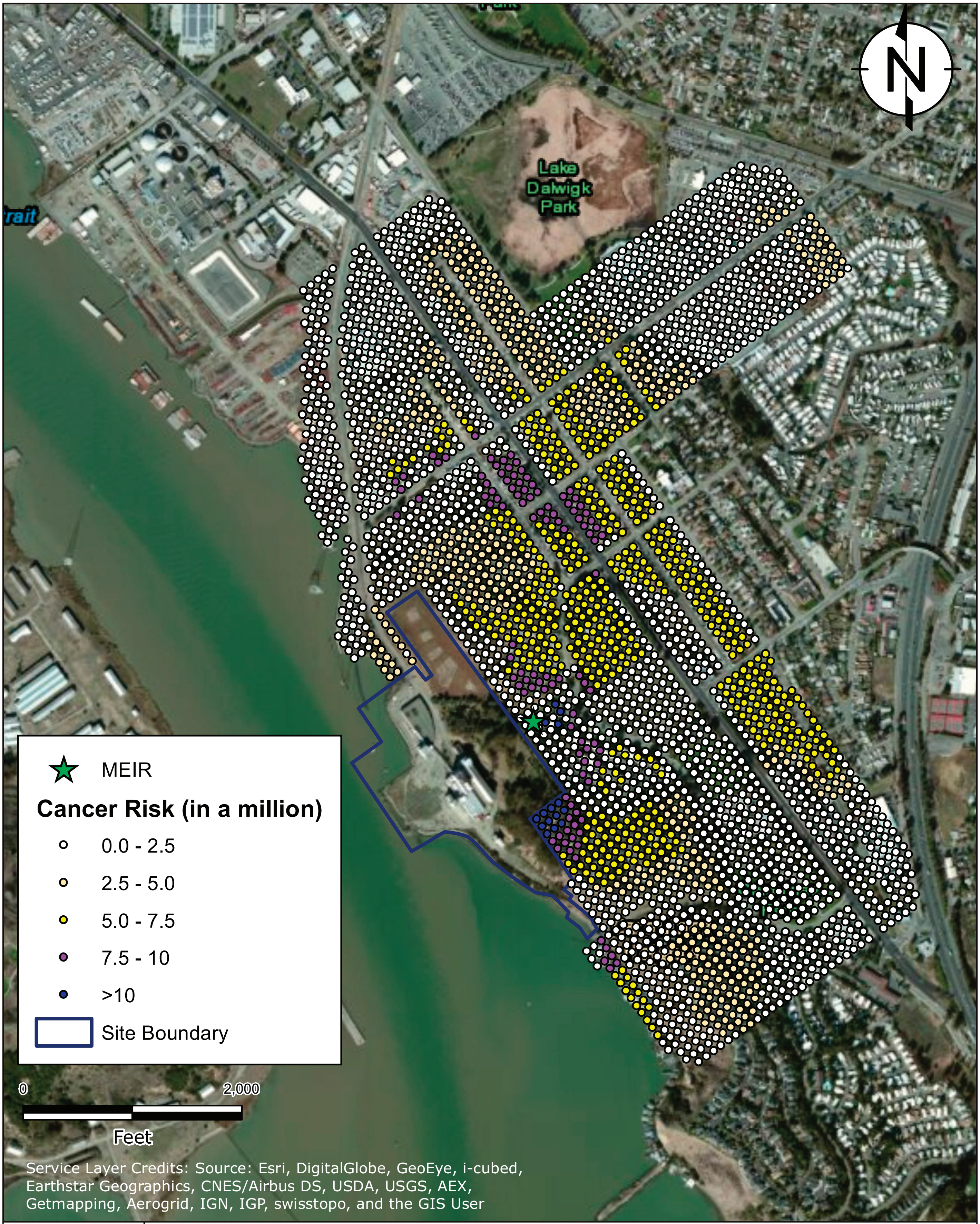
Impacts 3.2-1 and 3.2-5: As described previously, there is no feasible mitigation available to reduce Impacts 3.2-1 and 3.2-5, as the rezoning of the land has the potential to introduce a more intensive land use to the property and this potential change was not taken into account in the most recent state ozone plan—the Bay Area 2010 Clean Air Plan, adopted by the Board of Directors in September 2010 (BAAQMD 2010b). Therefore, the project would be considered inconsistent with the growth projections used to estimate future emissions anticipated in

BAAQMD's local air quality plans, and this project-specific and cumulative impact would remain **significant and unavoidable**.

Impacts 3.2-2 and 3.2-4: Mitigation Measure MM-3.2-1 as described in Section 3.2.5 would be implemented to reduce Impacts 3.2-2 and 3.2-4; however, this measure would not reduce impacts to a level that is less than significant. As such, Impacts 3.2-2 and 3.2-4 would remain **significant and unavoidable** with mitigation.

Impact 3.2-3: Implementation of MM 3.2-1 and MM 3.2-2 would reduce Impact 3.2-3 to **less than significant**.

Impact 3.2-6: Mitigation Measure MM-3.2-2 as described in Section 3.2.5 would be implemented to reduce Impact and 3.2-6. Mitigated cancer risk for various scenarios are presented in Table 3.2-19, along with the maximum average vessel calls per year allowable under each scenario before additional mitigation is required. Mitigation measures in Table 3.2-19 are intended to allow a choice of technologies based on the most cost-effective measures available at the time of implementation. As shown in Table 3.2-19, impacts related to cancer risk would be reduced to a **less-than-significant** level following implementation of MM-3.2-2.



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User

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SOURCE: RAMBOLL ENVIRON 2015

FIGURE 3.2-1

Cancer Risk: Unmitigated Full Operations (48 Ships)

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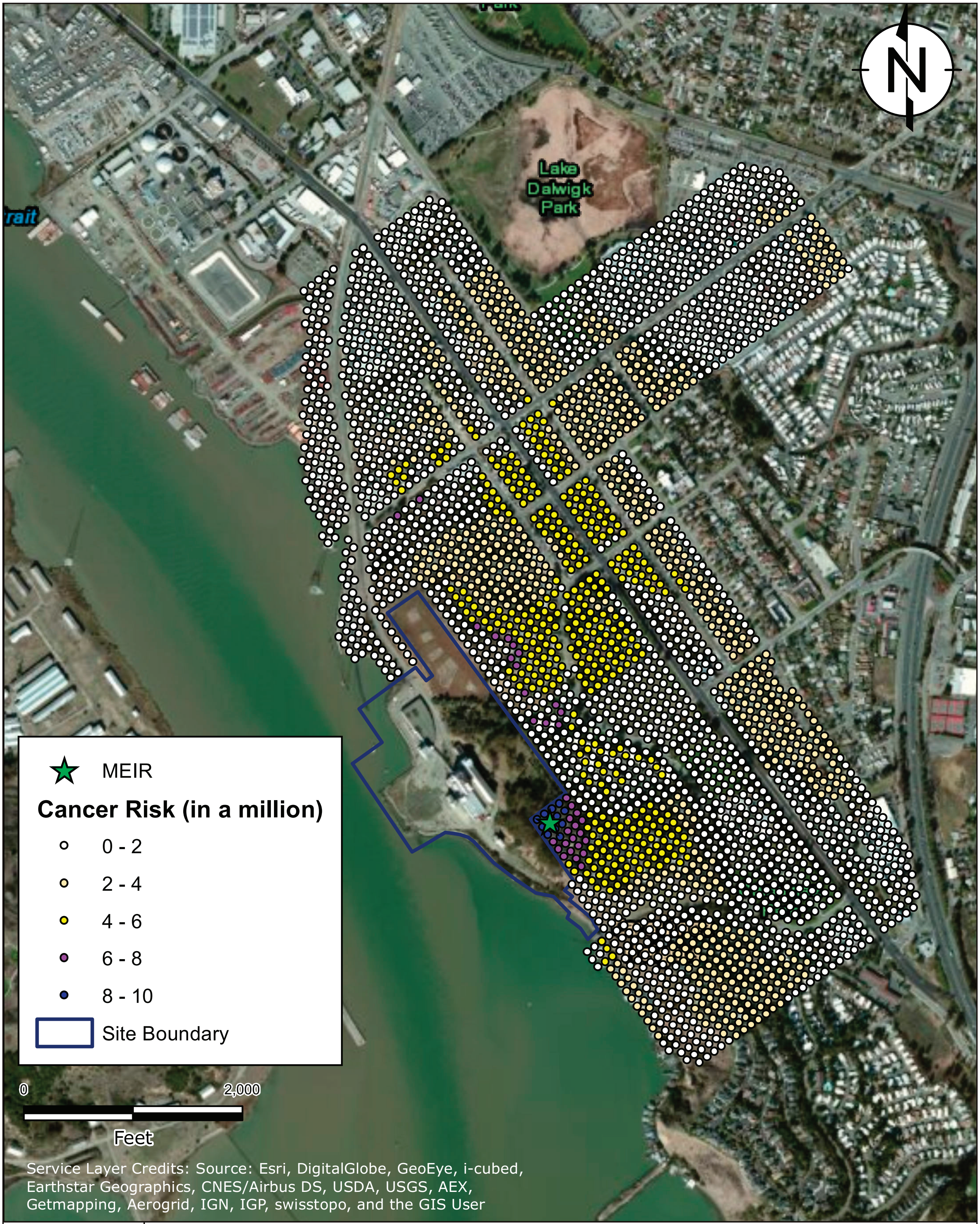

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SOURCE: RAMBOLL ENVIRON 2015

FIGURE 3.2-2

Cancer Risk: Unmitigated Full Operations (48 Ships)

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3.3 BIOLOGICAL RESOURCES

This section analyzes the potential impacts of the Vallejo Marine Terminal (VMT) and Orcem project (proposed project) with respect to terrestrial and marine/aquatic biological resources and recommends mitigation measures where necessary to reduce or avoid significant impacts. For the purposes of this California Environmental Quality Act (CEQA) assessment, the study area for the marine/aquatic resources includes the lower Napa River adjacent to Mare Island, the western portion of Carquinez Strait, and the eastern region of San Pablo Bay as it abuts the Carquinez Strait.

The onshore and offshore information used in the preparation of this section was obtained from regional biological and ecological habitat reports (NOAA Fisheries 2007, USFWS 1989), long-term regional studies such as the Regional Monitoring Program for Water Quality in San Francisco Bay–Delta, California Department of Fish and Wildlife (CDFW), the Interagency Ecological Program (IEP) for the San Francisco Bay–Delta, and other standard biological literature. In addition, the following information sources support the analysis presented in this section:

- Appendix E-1: WRA Environmental Consultants. 2008. *Biological Resources Assessment, General Mills Project, Vallejo, Solano County, California*. February 2008.
- Appendix E-2: WRA Environmental Consultants. 2008. *Tree Survey, General Mills Project, Vallejo, Solano County, California*. April 2008.
- Appendix E-3: Dudek. 2014. *Review of Biological Resources Assessment and Biological Resources Survey for the Vallejo Marine Terminal Project in the City of Vallejo, Solano County, California*. November 3, 2014.
- Appendix E-4: Applied Marine Sciences Inc. (AMS). 2014. *Field Report: Intertidal Habitat and Marine Biota Survey of the Vallejo Marine Terminal Site, Vallejo, California*. April 18, 2014.
- Appendix E-5: Applied Marine Sciences Inc. (AMS). 2014. *Technical Memorandum: Fish Species Inhabiting the Lower Napa River and San Pablo Bay*. June 25, 2014.
- Appendix E-6: Applied Marine Sciences Inc. (AMS). 2014. *Benthic Survey of Vallejo Marine Terminal LLC Site Vallejo, California*. August 2014.
- Appendix E-7: Applied Marine Sciences Inc. (AMS). 2015. *Technical Memorandum: Intertidal Habitat and Biological Community Survey at the Proposed Kayak Launch Site Located at the Vallejo Municipal Marina; Vallejo Marine Terminal CEQA Project.* July 1, 2015.

All figures referenced in this section are provided at the end of the section.

3.3.1 Regulatory Setting

Federal

Endangered Species Act

Section 9 of the Endangered Species Act (ESA) prohibits any “take” of a species that has been federally listed as threatened or endangered, except as permitted under the act. The definition of take is “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct,” and has been interpreted to include habitat modification that interferes with a species’ foraging, breeding, or shelter. For example, changes in land use (e.g., conversion of vernal pool wetlands to urban development) that could result in the loss of vernal pools occupied by fairy shrimp would be prohibited under the ESA unless a take permit was obtained.

Biological Assessments of the effects of the VMT component of the project pertaining to listed aquatic species, as derived from the information presented in this EIR, will be prepared for consultation submittal to National Oceanic and Atmospheric Administration Marine Fisheries Service (NOAA Fisheries), U.S. Fish and Wildlife Service (USFWS), and CDFW, and are expected to result in the issuance of Biological Opinions with final conditions of approval from NOAA Fisheries and USFWS, and an Incidental Take Permit (ITP) issued by CDFW. Consistent with CEQA Guidelines Section 15162, the final conditions of approval from NOAA Fisheries, USFWS, and CDFW shall supersede the corresponding mitigation measures presented in this EIR, provided that the required condition is not substantially different from that the mitigation listed in this EIR and would not change the finding that, with mitigation, the impact in question is reduced to a less-than-significant level.

Migratory Bird Treaty Act

Migratory birds are protected by the USFWS under the provisions of the Migratory Bird Treaty Act (MBTA) of 1916 as amended (16 U.S.C. Chapter 7, 703-712) which governs the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests. The take of all migratory birds is governed by the MBTA’s regulation of taking migratory birds for educational, scientific, and recreational purposes and requiring harvest to be limited to levels that prevent over utilization. Executive Order 13186 (signed January 10, 2001) directs each federal agency taking actions that would have or would likely have a negative impact on migratory bird populations to work with USFWS to develop a Memorandum of Understanding to promote the conservation of migratory bird populations. Protocols developed under the Memorandum of Understanding must include the following agency responsibilities:

- Avoid and minimize, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions.

- Restore and enhance habitat of migratory birds, as practicable.
- Prevent or abate the pollution or detrimental alteration of the environment for the benefit of migratory birds, as practicable.

The Executive Order is designed to assist federal agencies in their efforts to comply with the MBTA; it does not constitute any legal authorization to take migratory birds. Take, under the MBTA, is defined as the action of, or an attempt to, pursue, hunt, shoot, capture, collect, or kill (66 FR 3853–3856.). The definition includes "intentional" take (take that is the purpose of the activity in question) and "unintentional" take (take that results from, but is not the purpose of, the activity in question).

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act prohibits the taking or possession of and commerce in bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*), with limited exceptions. Under the act, it is a violation to "take, possess, sell, purchase, barter, offer to sell, transport, export or import, at any time or in any manner, any bald eagle commonly known as the American eagle, or golden eagle, alive or dead, or any part, nest, or egg, thereof." Take is defined to include pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, and disturb. Disturb is further defined as "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior." Recent revisions to the Bald and Golden Eagle Protection Act authorizes take of bald eagles and golden eagles under the following conditions: (1) where the take is compatible with the preservation of the bald eagle and golden eagle, (2) is necessary to protect an interest in a particular locality, (3) is associated with but not the purpose of an otherwise lawful activity, and (4) for individual instances of take the take cannot be avoided, or (5) for programmatic take the take is unavoidable even though advanced conservation practices are being implemented (16 U.S.C. 668 et seq.).

Federal Regulation of Wetlands and Other Waters

The U.S. Army Corps of Engineers (USACE) and the U.S. Environmental Protection Agency (EPA) regulate the discharge of dredged or fill material into waters of the United States, including wetlands, under Sections 404 and 401 of the Clean Water Act.

The Clean Water Act defines "wetland" as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3(b); 40 CFR 230.3(t)).

Projects that would result in the placement of dredged or fill material into waters of the United States (including vernal pools) may require a Section 404 permit from the USACE. The presence of federally listed species in vernal pools/wetlands requires the USACE to initiate consultation with the USFWS through Section 7 of the ESA and obtain a Biological Opinion prior to issuing any Section 404 permit. Some classes of fill activities may be authorized under general or nationwide permits if specific conditions are met. Nationwide permits do not authorize activities that are likely to jeopardize the existence of a threatened or endangered species listed or proposed for listing under the ESA. In addition to conditions outlined under each nationwide permit, the USACE, as part of the Section 404 permitting process, can require project-specific conditions. When a project's activities do not meet the conditions for a nationwide permit, an individual permit may be issued.

Finally, the federal government also supports a policy of minimizing "the destruction, loss, or degradation of wetlands." Executive Order 11990 (May 24, 1977) requires that each federal agency take action to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.

Section 401 of the Clean Water Act requires that applicants obtain a USACE permit to obtain state certification that the activity associated with the permit will comply with applicable state effluent limitations and water quality standards. In California, water quality certification, or a waiver, must be obtained from the Regional Water Quality Control Board (RWQCB), for both individual and nationwide permits.

The USACE also regulates activities in navigable waters under Section 10 of the Rivers and Harbors Act. The construction of structures, such as tide gates, bridges, or piers, or work that could interfere with navigation, including dredging or stream channelization, may require a Section 10 permit, in addition to a Section 404 permit if the activity involves the discharge of fill.

Magnuson–Stevens Fishery Conservation and Management Act

The Magnuson–Stevens Fishery Conservation and Management Act (Magnuson–Stevens Act) (16 U.S.C. 1801–1884) of 1976, as amended in 1996 and reauthorized in 2007, applies to fisheries resources and fishing activities in federal waters that extend to 200 miles offshore. Conservation and management of U.S. fisheries, development of domestic fisheries, and phasing out of foreign fishing activities are the main objectives of the legislation.

The Magnuson-Stevens Act defines "essential fish habitat" as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. The act, as amended through 2007, sets forth a number of new mandates for National Oceanic and Atmospheric Administration (NOAA) Fisheries, regional fishery management councils, and federal action agencies to identify essential fish habitat and to protect important marine and anadromous fish habitat. The Magnuson–Stevens Act provided NOAA Fisheries with legislative authority to regulate fisheries in the United States in the area between 3 miles and 200 miles offshore and established eight regional fishery management councils that manage the harvest of the fish and shellfish resources in these waters. The councils, with assistance from NOAA Fisheries, are required to develop and implement fishery management plans (FMPs), which include the delineation of essential fish habitat for all managed species. An FMP is a plan to achieve specified management goals for a fishery and is composed of data, analyses, and management measures. Essential fish habitat that is identified in an FMP applies to all fish species managed by that FMP, regardless of whether the species is a protected species or not. Federal agency actions that fund, permit, or carry out activities that may adversely affect essential fish habitat are required under Section 305(b), in conjunction with required Section 7 consultation under ESA, to consult with NOAA Fisheries regarding potential adverse effects of their actions on essential fish habitat and to respond in writing to NOAA Fisheries' recommendations. An Essential Fish Habitat Assessment of the effects of the VMT component of the project on species covered under the Magnuson–Stevens Act is being prepared for submittal to the National Marine Fisheries Service.

The lower Napa River, Carquinez Strait, and San Pablo Bay areas of the San Francisco Bay–Delta, are designated as essential fish habitat for fish managed under three FMPs and as a Habitat Area of Particular Concern under two FMPs. A total of 20 species of commercially important fish and sharks managed in the Pacific groundfish and coastal pelagics FMPs use this region of the Bay–Delta as either essential fish habitat or habitat area of particular concern. In addition, the Pacific coast salmon FMP, which includes Chinook salmon (*Oncorhynchus tshawytscha*) and coho salmon (*Oncorhynchus kisutch*), identifies all of the San Francisco Bay–Delta as essential fish habitat (USACE and EPA 2009).

Rivers and Harbors Appropriations Act of 1899

Section 10 of the Federal Rivers and Harbors Appropriations Act of 1899 (30 Stat. 1151, codified at 33 U.S.C. 401, 403) prohibits the unauthorized obstruction or alteration of any navigable water. Navigable waters under the act are those "subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce" (33 CFR 3294). Typical activities requiring Section 10 permits are construction of piers, wharves, bulkheads, marinas, ramps, floats, intake structures, cable or pipeline crossings, and dredging and excavation.

Marine Mammal Protection Act

The Marine Mammal Protection Act of 1972 (MMPA), as amended in 1981, 1982, 1984, and 1995, establishes a federal responsibility for the protection and conservation of marine mammal species by prohibiting the "take" of any marine mammal (16 U.S.C. Ch. 31). The MMPA defines "take" as the act of hunting, killing, capture, and/or harassment of any marine mammal, or the attempt at such. The act also imposes a moratorium on the import, export, or sale of any marine mammals, parts, or products within the United States. These prohibitions apply to any person performing an activity in U.S. waters and to any U.S. citizen in international waters.

The primary authority for implementing the MMPA belongs to the USFWS and NOAA Fisheries. The USFWS is responsible for ensuring the protection of sea otters (*Enhydra lutris*) and marine otters (*Lontra felina*), walruses (*Odobenus rosmarus*), polar bears (*Ursus maritimus*), three species of manatees (Trichechidae), and dugongs (Dugonginae). NOAA is responsible for protecting pinnipeds (seals and sea lions) and cetaceans (whales and dolphins).

The MMPA, as amended, provides for the "incidental take" of marine mammals during marine activities, as long as NOAA Fisheries finds the "take" would be of small numbers of individuals and have no more than a negligible impact on those marine mammal species not listed (i.e., listed under the ESA, as depleted under the MMPA, and not having an immitigable adverse impact on subsistence harvests of these species.

National Invasive Species Act

Under the National Invasive Species Act of 1996 (16 U.S.C. 4701), the U.S. Coast Guard established national voluntary ballast water[1] guidelines. The Coast Guard published regulations on June 14, 2004, establishing a national ballast water management program with mandatory requirements for all vessels equipped with ballast water tanks that enter or operate in U.S. waters. The regulations carry mandatory reporting requirements to aid in the Coast Guard's responsibility, under the National Invasive Species Act, to determine patterns of ballast water movement. The regulations also require ships to maintain and implement vessel-specific ballast water management plans.

Estuary Protection Act

The Estuary Protection Act (16 U.S.C. 1221 et seq.) highlights the value of estuaries and the need for conservation of their valuable natural resources. It authorizes the Secretary of the Interior, in cooperation with other federal agencies and the states, to study and inventory

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[1] Fresh or salt water, sometimes containing sediments, held in tanks and cargo holds of ships to increase stability and maneuverability during transit.

estuaries of the United States and to determine whether any areas should be acquired by the federal government for future protection.

Under this act, the Secretary of the Interior is required to review all project plans and reports for land and water resource development affecting estuaries and make an assessment of likely impacts and related recommendations for conservation, protection, and enhancement of estuaries.

Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) enacted by Congress in 1972 (16 U.S.C. 1451 et seq.) is administered by the NOAA’s Office of Ocean and Coastal Resource Management. The CZMA provides for management of the nation’s coastal resources, including the Great Lakes, and balances economic development with environmental conservation. The CZMA outlines two national programs: the National Coastal Zone Management Program and the National Estuarine Research Reserve System. The 34 coastal programs aim to balance competing land and water issues in the coastal zone, while estuarine reserves serve as field laboratories to provide a greater understanding of estuaries and how humans impact them. The overall program objectives of CZMA remain balanced to “preserve, protect, develop, and where possible, to restore or enhance the resources of the nation’s coastal zone.”

Under Section 307 of the CZMA (16 U.S.C. 1456), activities that may affect coastal uses or resources that are undertaken by federal agencies, require a federal license or permit, or receive federal funding must be consistent with a state’s federally approved coastal management program. California’s federally approved coastal management program consists of the California Coastal Act, the McAteer–Petris Act, and the Suisun Marsh Protection Act. The California Coastal Commission implements the California Coastal Act and the federal consistency provisions of the CZMA for activities affecting coastal resources outside of San Francisco Bay. The Bay Conservation and Development Commission (BCDC) implements the McAteer–Petris Act and the Suisun Marsh Preservation Act and performs federal consistency reviews for activities affecting the San Francisco Bay–Delta and the Bay shoreline.

State

California Endangered Species Act

The California Endangered Species Act (CESA) (California Fish and Game Code, Section 2050 et seq.) prohibits the taking of species listed as threatened or endangered under the act, or candidates for listing, except as authorized by state law. CESA defines take as “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill.” Section 2081 of the CESA states that take of an endangered, threatened, or candidate species may be authorized by

CDFW if the impacts of the take are incidental to an otherwise lawful activity, are “minimized and fully mitigated,” and do not “jeopardize the continued existence of [the] species.” Any mitigation measures imposed under CESA must be measures “roughly proportional in extent to the impact of the authorized taking on the species.”

Porter–Cologne Water Quality Control Act

The Porter–Cologne Water Quality Control Act (California Water Code, Section 13000 et seq.) directs the State Water Resources Control Board (SWRCB) to formulate and adopt state policies for controlling water quality and designates the SWRCB as the state water pollution control agency for all purposes stated in the Clean Water Act. This means that the SWRCB and its designee, the Regional Water Quality Control Board, fulfill the role contemplated by Section 401 of the Clean Water Act, which provides for the state water pollution control agency to certify that a permit being issued under Section 404 complies with state water quality laws.

California Fish and Game Code

The California Fish and Game Code governs state-designated wetlands, including riparian and stream habitat, and mandates that mitigation be implemented to replace wetland extent and value lost to development. Sections 1600–1607 of the Fish and Game Code regulate activities that would affect rivers, streams, or lakes by altering the flow; substantially changing or using any materials from the bed, channel, or bank of any river, stream, or lake; or disposing of debris. Activities that affect these areas, as well as associated riparian habitats, would require a Streambed Alteration Permit from CDFW. Section 3503 of the Fish and Game Code prohibits impacts to actively nesting birds, their nests, or their eggs. Section 3503.5 prohibits killing of raptor species and destruction of raptor nests.

The Fish and Game Code provides protection from take for a variety of species, referred to as *fully protected species*. Fish and Game Code Section 3511 lists fully protected birds and prohibits take of these species. The code defines *take* as “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill.” Except for take related to scientific research, all take of fully protected species is prohibited.

Prior to creation of CESA and the federal ESA, the State of California first began to designate species as “fully protected” and typically applied this designation to those animals that were rare or faced possible extinction. Fish and Game Code Section 4700 (a)(1) affirms the state’s protection of fully protected species by regulating that such species “may not be taken or possessed at any time.”

Marine Life Management Act

Within California, most of the legislative authority over fisheries management is enacted within the Marine Life Management Act (California Fish and Game Code, Sections 90–99.5, 105, 7050–7090, 8585–8589.7, 8842, and 9001.7). This law directs CDFW and the Fish and Game Commission to issue sport and commercial harvesting licenses, as well license aquaculture operations. CDFW, through the commission, is the state's lead biological resource agency and is responsible for enforcement of the state endangered species regulations and the protection and management of all state biological resources.

Marine Invasive Species Act

All shipping operations that involve major marine vessels are subject to the Marine Invasive Species Act of 2003 (California Public Resources Code, Section 71200 et seq.), which revised and expanded the California Ballast Water Management for Control of Non-indigenous Species Act of 1999 (Assembly Bill 703). The State Lands Commission administers this act that regulates the handling of ballast water from marine vessels arriving at California ports in order to prevent or minimize the introduction of invasive species from other regions.

San Francisco Bay Plan and San Francisco Waterfront Special Area Plan

In 1968, the San Francisco BCDC adopted the San Francisco Bay Plan (Bay Plan), which has been periodically amended over the past 45 years. Of importance to this project, the Bay Plan specifies goals, objectives, and policies for existing and proposed waterfront land use and other areas under the jurisdiction of the BCDC (BCDC 2012).

Of particular importance to aquatic biological resources, the Bay Plan identifies that fill should be limited to providing substantial public benefits provided that these same benefits could not be achieved equally well without filling. Developing adequate port terminals, on a regional basis, to keep San Francisco Bay in the forefront of the world's great harbors, is an identified acceptable benefit for filling in areas of the Bay under the Bay Plan (BCDC 1968).

However, the Bay Plan also establishes that Bay filling "destroys the habitat of fish and wildlife, future filling can disrupt the ecological balance in the Bay, which has already been damaged by past fills, and can endanger the very existence of some species of birds and fish. The Bay, including open water, mudflats, and marshlands, is a complex biological system, in which microorganisms, plants, fish, waterfowl, and shorebirds live in a delicate balance created by nature, and in which seemingly minor changes, such as a new fill or dredging project, may have far-reaching and sometimes highly destructive effects" (BCDC 1968).

Local and Inter-Agency

San Francisco Bay Subtidal Habitat Goals Project

In 2010, BCDC, the California Ocean Protection Council/California State Coastal Conservancy, NOAA, and the San Francisco Estuary Partnership, in collaboration with each other and the broader scientific community, managers, restoration practitioners, and stakeholders, published a set of restoration planning goals and guidelines for the subtidal areas and habitats of the San Francisco Bay–Delta (SFBSHGP 2010). Though currently neither a policy nor regulatory document, this report offers guidance on opportunities for subtidal restoration and protection. Implementation will occur through a number of avenues. Local governments may incorporate these recommendations into their planning processes and documents and regulatory agencies may use this report to evaluate, revise, or implement their policies. Subtidal habitat consists of all the submerged area beneath the Bay water's surface, including mud, shell, sand, rocks, artificial structures, shellfish beds, submerged aquatic vegetation, macroalgal beds, and the water column above the bay bottom. Submerged habitats are important for threatened species such as green sturgeon (*Acipenser medirostris*), steelhead (*Oncorhynchus mykiss irideus*), and Chinook salmon, commercial species such as Dungeness crab (*Cancer magister*) and Pacific herring (*Clupea pallasi*), species of special concern such as eelgrass and the native Olympia oyster, and a host of other fish, shrimp, crabs, migratory waterfowl, and marine mammals.

The San Francisco Bay Subtidal Habitat Goals Project takes a Baywide approach in setting science-based goals for maintaining a healthy, productive, and resilient ecosystem. Where possible, these subtidal goals are designed to connect with intertidal habitats and with goals developed by other projects, including goals for Baylands and uplands habitats. The goals and recommendations contained within the Subtidal Habitat Goals Project are not binding by regulation but rather are intended to serve as guidance to local, state, and federal agencies when evaluating projects and their potential ecological effects, and when issuing permits.

The principal habitat conservation goals included in the Subtidal Habitat Goals Report that apply to the VMT component of the project include:

- Soft Substrate
  - Promote no net increase to disturbance to San Francisco Bay soft bottom habitat
  - Promote no net loss to San Francisco Bay subtidal and intertidal sand habitats
- Rock Habitats
  - Promote no net loss of natural intertidal and subtidal rock habitats in San Francisco Bay
- Artificial Structures

  - Enhance and protect habitat function and the historical value of artificial structures in San Francisco Bay
  - Improve San Francisco Bay subtidal habitats by minimizing placement of artificial structures that are detrimental to subtidal habitat function
- Shellfish Beds
  - Protect San Francisco Bay native shellfish habitats (particularly native oyster *Ostrea lurida*) through no net loss to existing habitats
- Submerged Aquatic Vegetation
  - Protect existing eelgrass habitat in San Francisco Bay through no net loss to existing beds
  - Protect Macroalgal Beds
  - Protect San Francisco Bay Fucus beds through no net loss to existing beds
  - Protect San Francisco Bay Gracilaria beds through no net loss to existing beds

City of Vallejo

The Vallejo General Plan, adopted in July 1999, establishes goals and policies that guide land use and development within the City's Planning Area, which includes lands within the City limits and lands outside the City limits, but within the City's Sphere of Influence.

The following goals and policies from the 1999 General Plan (City of Vallejo 1999) are applicable to the proposed project. The City's Open Space and Resource Conservation Element (1976) does not contain any goals or policies applicable to the project.

Waterfront Development Goal: To have a waterfront devoted exclusively to water oriented uses, including industrial, residential, commercial and open space uses, which permit public access.

- Policy 3: The following public access to and along public waterways, streams and rivers is required where feasible:
  a. Access to the water every 1,500 feet;
  b. Access way to be a minimum of 50 feet wide;
  c. Access along the: water to be a minimum of 200 feet in width;
  d. Planned Developments and commercial and industrial areas may vary provided they are within the intent and purpose of this provision.

Fish and Wildlife Resources Goal: To protect valuable fish and wildlife habitats.

- *Policy 5:* Recognize areas valuable for marine life production, particularly the Napa Marshes and Carquinez Strait, and work with the California Department of Fish and Game and Bay Conservation and Development Commission in insuring the protection of these areas from incompatible uses.

City of Vallejo Municipal Code

Chapter 10.12, Trees, of the City's Municipal Code includes requirements for tree removal and pruning. A permit is required to remove trees and tree replacement is required for any street trees removed (City of Vallejo 1988).

3.3.2 Existing Conditions

The San Francisco Bay–Delta is the second largest estuary in the United States (NOAA Fisheries 2007) and is composed of multiple aquatic/marine habitats and biological communities. It encompasses approximately 479 square miles (1,241 square kilometers), including shallow mudflats (NOAA Fisheries 2007). Typically, San Francisco Bay (the Bay) is divided into four main basins: South Bay, Central Bay, San Pablo or North Bay, and Suisun Bay. The most northern and upstream region is Suisun Bay, which transforms quickly into the diked wetlands of Suisun Marsh and the west Delta. Suisun Bay lies east of the Carquinez Strait to the westerly point where the Sacramento and San Joaquin Rivers combine at the Sacramento Delta, providing the main source of freshwater into San Francisco Bay. San Pablo Bay is immediately east of the Carquinez Strait and Suisun Bay and connects to the Central Bay at the Richmond–San Rafael Bridge. Along with being the major source of freshwater input, sediments are also transported into the Bay primarily by the Sacramento and San Joaquin Rivers, but also by the Yolo Bypass, Mokelumne River, Calaveras River, Cosumnes River, and several other smaller tributaries (NOAA Fisheries 2007). Both the Napa and Petaluma Rivers flow into San Pablo Bay.

The project site is located at the southern end of the Napa River just prior to flowing into the Carquinez Strait and San Pablo Bay (see Figure 1-2 in Chapter 1, Introduction).

Terrestrial Biology

A biological resources assessment was conducted in 2008 by WRA (Appendix E-1). It evaluated the 38 acres that comprise the former General Mills plant site. An updated biological survey and site visit was subsequently performed by a Dudek biologist in April 2014 (Appendix E-3). The project site was traversed on foot to determine if any sensitive plant communities were present within the area, if existing conditions provide suitable habitat for any special-status plant or wildlife species, and if any sensitive habitats were present.

The western portion of the project site is generally flat, and a hillside is adjacent to the eastern side of the existing industrial buildings. The slope has a southwestern aspect and is undeveloped with the exception of an abandoned residence and associated storage-type buildings. On the southern portion of the slope a eucalyptus grove is present.

The project site is bordered to the east and north by residential and commercial development. To the south, there is a small area of open space, predominately non-native grassland and on the west the site is bordered by the Mare Island Strait. Elevations in the area range from 0 to 140 feet.

Non-sensitive Biological Communities

The project site is primarily composed of non-sensitive biological communities: non-native grassland, non-native trees and shrubs, and developed industrial areas (Figure 3.3-1, Vegetative Communities).

Non-native Grassland

The non-native annual grassland present on portions of the hillside tended to be weedy and disturbed. Disking occurs regularly in this portion of the site. Dominant species appeared to be Johnsongrass (*Sorghum halepense*), wild oats (*Avena* sp.), fennel (*Foeniculum vulgare*), and mustard (*Brassica nigra*). Regular disking reduces the suitability of the grassland habitat for special-status wildlife species.

Non-native Trees and Shrubs

Stands of non-native trees are present in the southern portion of the hillside, and a row of exotic shrubs appears to have been planted along the southern shoreline. Dominant species in the grove of trees are non-native species including acacia (*Acacia* spp.), eucalyptus (*Eucalyptus* spp.), and pines (*Pinus* spp.). Exotic shrubs including Spanish broom (*Spartium junceum*) are also present among the trees. Much of the understory of these groves is disked and/or consists of leaf litter from the trees; therefore, suitable habitat for native plants is limited.

A tree survey prepared for the project by WRA in 2007 identified 523 trees 6 inches or larger diameter at breast height (dbh) (see Appendix E-2). The majority of the trees on the site are blue gum (*Eucalyptus globulus*) and white ironbark eucalyptus (*Eucalyptus leucoxylon*) (265 trees), followed by blackwood acacia (*Acacia melanoxylon*; 61 trees) and Monterey pine (*Pinus radiata*; 55). These tree species make up 73% of trees on the site. The full list of trees is provided in Appendix E-2. No trees surveyed on the site are native to this region of California with the exception of seven coast live oaks (*Quercus agrifolia*) and one toyon (*Heteromeles arbutifolia*).

Developed Industrial Areas

Developed areas within the project site consist of paved areas and roads (some gravel) containing only sparse vegetation. These areas provide little to no value as habitat for plant and wildlife species due to the high level of disturbance and human activity. Plant species present in these areas include chicory (*Cichorium intybus*) and bristly ox-tongue (*Picris echioides*). Buildings in this portion of the project site have the potential to provide suitable nesting or roosting habitat for native wildlife species such as bats and birds. No wildlife species were observed utilizing the developed portion of the site during the 2007 field visit. However, an active osprey (*Pandion haliaetus*) nest was identified on top of the flour mill building on the site during the 2014 field visit.

Sensitive Biological Communities

Northern Coastal Salt Marsh

Northern Coastal Salt Marsh consists of salt-tolerant hydrophytes forming moderate to dense cover and is usually found along sheltered inland margins of bays, lagoons, and estuaries (Holland 1986). This plant community occurs in the project site on a small portion (0.01 acre) of the southern shoreline along Mare Island Strait. The dominant species in this community are salt grass (*Distichlis spicata*) and jaumea (*Jaumea carnosa*). No wildlife species were observed in this community, and due to its small size and lack of extensive pickleweed, is unlikely to support any special-status species.

Seasonal Wetland

A small (0.02 acre) seasonal wetland plant community is present in the southern portion of the project site at the base of the steep hillside. It is located in a slight depression approximately 50 feet from Mare Island Strait. In between the wetland and Mare Island Strait are ruderal grassland, a flat, dirt lot, and a border of upland shrubs. Portions of this wetland were ponded during the late June field visit in and may have perennial hydrology. The plant species were a mix of cattail (*Typha angustifolia*) in the wetter portions and species including Bermuda grass (*Cynodon dactylon*), bristly ox-tongue, and willowherb (*Epilobium ciliatum*) in the drier portions. No wildlife species were observed in this community. Due to its small size, this wetland is unlikely to support any special-status species.

A wetland delineation performed by WRA in 2007 (see Appendix E-1) determined that a small seasonal wetland is potentially under the jurisdiction of the USACE. The seasonal wetland does not appear to connect to any other wetlands or waters of the U.S. The wetland is dominated by wetland species including cattail, Bermuda grass, willowherb, and bristly ox-tongue. The wettest area of the wetland, which may be better described as emergent marsh, has hydric soils characterized by histosols and was inundated or saturated at the time of the field visit. The drier areas of the wetland had moist soils exhibiting redoximorphic features. The source of wetland hydrology for this feature was presumed to be hillside runoff or a hillside seep. The wetland was dry at the time of the 2014 field visit.

Common Wildlife Species

The wildlife species likely to occur on the project site are common species that are adapted to life in proximity to human activity, such as raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginiana*), and small mammal and reptile species like mice (*Microtus* sp.) and western fence lizard (*Sceloporus occidentalis*).

Wildlife species observed during the April 2014 field visit included osprey, great egret (*Ardea alba*), black phoebe (*Sayornis nigricans*), and turkey vulture (*Cathartes aura*). As previously noted, an active osprey nest was observed on top of the flour mill building during the 2014 visit.

Special-Status Species

Special-Status Plants

The results of the nine-quad database searches for special-status plant species identified 11 special-status plant species that have been documented in the vicinity of the project site. No special-status plant species were observed in the project site during the field visit in June 2007, during the March 2007 reconnaissance rare plant survey, or the April 2014 field visit by Dudek (see Appendix E-3). The purpose of the 2007 reconnaissance rare plant survey was to search for Johnny-jump-up (*Viola pedunculata*) and potential special-status plant species. No Johnny-jump-up or special-status plant species were found during the survey. All 11 species documented to occur in the vicinity of the project site are unlikely or have no potential to occur because the site lacks suitable habitat and/or because the species were not observed during the various site visits.

Special-Status Wildlife

The results of the nine-quad California Natural Diversity Database (CNDDB) search, USFWS threatened and endangered species list, and other literature review conducted for the site identified a total of 32 special-status wildlife species recorded in the vicinity of the project site. Out of these 32 species, 7 have some potential to occur on the project site or have been documented in the area (CDFW 2014a). These are listed in Table 3.3-1 and depicted on Figure 3.3-2, CNDDB Special-Status Species Occurrences.

Table 3.3-1
Special-Status Wildlife Species with Potential to Occur On or Near the Project Site

Scientific Name	Common Name	Status (Federal /State)	Primary Habitat Associations	Potential to Occur On or Near the Project Site
Sterna caspia	Caspian tern	USFWS Bird of Conservation Concern	Nests in dense colonies on undisturbed islands, levees, or shores. Nests are scraped, unlined depressions in soil near water. Barren, or nearly barren, sites are preferred.	This species was observed flying over the project site in 2007. Low potential to breed on the site.
Ardea herodias	Great blue heron	CDFW Protected Rookery Sites	This species feeds mostly in slow moving or calm freshwater, also along seacoasts. Occasionally in surf and fields. Nests in trees, bushes, on ground, and artificial structures, usually near water.	High potential to occur. The shoreline and thicket may provide suitable foraging and nesting for this species.
Corynorhinus townsendii	Townsend's big-eared bat	CDFW, Western Bat Working Group Candidate Threatened	Requires caves, mines, tunnels, buildings, or other human-made structures for roosting. May use separate sites for night, day, hibernation, or maternity roosts.	Moderate potential to occur. The unoccupied buildings may provide suitable roosting habitat for this species.
Ardea alba	Great egret	CDFW Protected Rookery Sites	Rookery sites are located near marshes, tide-flats, irrigated pastures, and margins of rivers and lakes. Nests in large trees and roosts in trees.	Moderate potential to occur. Dense vegetation along the shoreline may provide roosting habitat for this species. Eucalyptus trees may provide suitable nesting habitat for this species.
Reithrodontomys raviventris	Salt-marsh harvest mouse	USFWS/CDFW Endangered	Primary habitat in pickleweed dominated saline emergent marshes of San Francisco Bay. Require adjacent upland areas for escape from high tides.	Low potential to occur. A small salt marsh exists on site, but provides little quality habitat for this species.
Rallus longirostris obsoletus	California clapper rail	USFWS/CDFW Endangered	Locally common yearlong in coastal wetlands and brackish areas around San Francisco. Forages in higher marsh vegetation, along vegetation and mudflat interface, and along tidal creeks. Requires shallow water and mudflats for foraging, with adjacent higher vegetation for cover during high water.	Low potential to occur. A small salt marsh and wetland exists on site, but provides little quality habitat for this species.

Table 3.3-1
Special-Status Wildlife Species with Potential to Occur On or Near the Project Site

Scientific Name	Common Name	Status (Federal /State)	Primary Habitat Associations	Potential to Occur On or Near the Project Site
Riparia riparia	Bank swallow	CDFW Threatened	Restricted to riparian, lacustrine, and coastal areas with vertical banks, bluffs, and cliffs with fine-textured or sandy soils, into which it digs nesting holes. Feeds predominantly over open riparian areas, but also over brushland, grassland, wetlands, water, and cropland.	Low potential to occur. The cliff below the grove of eucalyptus trees provides minimal suitable habitat for a colony.

Marine Biology

The predominant marine/aquatic habitat types in San Francisco Bay–Delta include open water (pelagic), soft sediment subtidal and intertidal, and hard bottom subtidal and intertidal environments (NOAA Fisheries 2007). The open water (pelagic) environment is the predominant habitat of San Pablo Bay, the Carquinez Strait, and lower Napa River, and includes the area between the water surface and the seafloor. The physical conditions of the open water environment are constantly changing with tidal flow and season. Each of the Bay basins and rivers flowing into the Bay–Delta are heavily influenced by ocean water brought into the Bay by the daily tidal cycle and by freshwater flow from the many rivers and tributaries that flow to the Pacific Ocean through the Bay–Delta. The water column provides habitat for plants (phytoplankton), invertebrates (zooplankton), fishes, birds, and marine mammals, which make up the pelagic communities. The Napa River is tidally influenced as far upriver as the city of Napa, with two high and low tides per 24-hour period. As a result of the daily tidal flow of the Napa River past the VMT Site, the area can result in significant currents.

Soft bottom (benthic) habitats of the San Francisco Bay–Delta seafloor include mud/silt/clay, sand, pebble/cobble, and shell mix. Exposure to wave and current action, temperature, salinity, and light penetration determines the composition and distribution of organisms within the sediments. Most surveys and other information sources indicate unconsolidated sediments are present throughout the Bay–Delta and are the most common substrate type in San Francisco Bay (NOAA Fisheries 2007).

Hard bottom (benthic) habitat in the study area consists of natural and artificial surfaces. Natural substrates include boulders, rock face outcrops, and low relief rock. Artificial hard substrate includes vessel structures, pilings, riprap, and pipelines. Pilings, riprap, and pipelines can be found in every region of the San Francisco Bay–Delta. Hard substrate provides habitat for an assemblage of marine algae, invertebrates, and fishes. Natural substrates provide surface area for algae and diatoms and foraging areas for birds and marine mammals. Boulders and rock face outcrops provide substrate for fish rearing, spawning, and growth.

Open Water (Pelagic) Habitat

Plants and Phytoplankton

Diatoms followed by dinoflagellates and cryptophores dominate the phytoplankton community in San Pablo Bay, Carquinez Strait, and the project area (NOAA Fisheries 2007). Most of the phytoplankton species in San Francisco Bay can tolerate broad ranges of salinity and temperature (NOAA Fisheries 2007), and as a result can be found in the North, South, and Central Bays. Similarly, the freshwater species, *Skeletonema potamos* is carried into the Bay with the freshwater flows from the Delta and are regularly found in San Pablo Bay and the project area (NOAA Fisheries 2007). Because of the flow of ocean water from Central Bay into San Pablo Bay, red algae (*Polysiphonia denudata*) can occasionally be observed floating in the water (NOAA Fisheries 2007). The kelps, *Laminaria* spp. and *Egregia* spp., are found in addition to other species such as *Ahnfeltiopsis* ssp. (formerly *Gymnogongrus*) and *Halymenia* spp. that are common on the outer exposed rocky coast.

Zooplankton

The zooplankton community in the study area consists of small invertebrate organisms that spend all or a portion of their life cycle in the water column. These include microzooplankton (tintinnids, rotifers, and copepod nauplii), larger copepods (small crustaceans), cladocerans (small crustaceans or water fleas), and the larvae of benthic and pelagic invertebrate animals and fish (meroplankton). Zooplankton species typically change seasonally with a few species being present throughout the year. Several introduced species in the 1980s have changed the zooplankton community's dominant taxa. Bay meroplankton is dominated by northern anchovy (*Engraulis mordax*); longfin smelt (*Spirinchus thaleichthys*); Pacific herring; plainfin midshipman (*Porichthys notatus*); sea gooseberry (*Pleurobrachia bachei*); isopod (*Synidotea laticauda*); the shrimps *Palaemon macrodactylus*, *Crangon franciscorum,* and *C. nigricauda*; the mysid *Neomysis kadiakensis;* and the medusa *Polyorchis* spp. (NOAA Fisheries 2007).

Fish

Seventeen (17) species of pelagic fish have been documented inhabiting the deep and shallow water areas of San Pablo Bay and the Carquinez Strait adjacent to the Napa River mouth into San Pablo Bay (Appendix E-4). Six of these species account for over 96% of the total abundance, with the dominant species, northern anchovy and Pacific herring (*Clupea pallasii*) comprising

76.5 % and 14.4 %, respectively, of the fish inhabiting the pelagic zone. Other dominant fish species include American shad (*Alosa sapidissima*), longfin smelt, striped bass (*Morone saxatilis*), and Bay goby (*Lepidogobius lepidus*), which collectively account for 5.3% of the total abundance inhabiting the water column. Additional pelagic species that are present in low abundance include Chinook salmon, plainfin midshipman, jacksmelt (*Atherinopsis californiensis*), splittail (*Pogonichthys macrolepidotus*), threadfin shad (*Dorosoma petenense*), delta smelt (*Hypomesus transpacificus*), threespine stickleback (*Gasterosteus aculeatus*), Pacific staghorn sculpin (*Leptocottus armatus*), English sole (*Parophrys vetulus*), and starry flounder (*Platichthys stellatus*).

Important managed, protected, or special-status pelagic zone species that are found in the Study Area, either seasonally or year-round, include northern anchovy, Pacific herring, longfin smelt, delta smelt, steelhead, and Chinook salmon (Appendix E-5; IEP 2010–2012, USFWS 2013a; CDFW 2014b). Delta smelt and winter-run Chinook salmon are listed as endangered and currently protected under both the ESA and CESA. Central California Coast distinct population segment (DPS) steelhead trout are listed under the ESA as threatened and are a species of special concern under CESA. Longfin smelt are listed under CESA as threatened and under the ESA as a species worthy of protection, but which cannot be formally listed at this time (USFWS 2013b).

Northern anchovy is the only managed species under the Magnuson–Stevens Act (Coastal Pelagic FMP) observed to be present in the study area (IEP 2010–2012), and Pacific herring is considered a species of special concern in the San Francisco Bay–Delta by NOAA Fisheries (NOAA Fisheries 2007).

Finally, the project area is located along an established migration corridor for adult steelhead and smolts as well as fall-run Central Valley ESU Chinook salmon and smolts. Both the main shipping channel and adjacent shallows are used by steelhead and salmon for migration and foraging (NCRCD 2012). Although CDFW data (IEP 2010–2012) do not indicate that steelhead or Chinook salmon are present in the project area in any significant numbers, individuals can be expected to be present during migration times. The lower Napa River is considered foraging habitat for both longfin and delta smelt.

Marine Mammals

Seven species of marine mammals use the pelagic water column habitat in San Francisco Bay for migrating and foraging (NOAA Fisheries 2007). Marine mammals frequently observed in San Pablo Bay and the lower reaches of the Napa River include harbor seals (*Phoca vitulina*), California sea lions (*Zalophus californianus*), and the harbor porpoise (*Phocoena phocoena*). California gray whales (*Eschrichtius robustus*) occasionally swim into San Francisco and San Pablo Bays on their annual migrations between Mexico and Alaska (NOAA Fisheries 2007).

Harbor seals and California sea lions forage for fish throughout the San Francisco Bay–Delta, including schooling northern anchovy and Pacific herring, but also feed on migratory Pacific lamprey, salmonids, and mysid shrimp and other invertebrates within the water column (NOAA Fisheries 2007). Harbor porpoises predominantly occur in central San Francisco Bay, but individuals have been observed in San Pablo Bay and the lower reaches of the Napa River (NOAA Fisheries 2009a; Todorov 2007). All of these species are protected under the federal MMPA. There are no major haul-outs or rookeries in San Pablo Bay, Carquinez Strait, or the lower Napa River for any marine mammals, but individuals may still use various structures to haul out and rest.

Birds

Dominant marine birds inhabiting or utilizing San Pablo Bay and the project area include cormorants (*Phalacrocorax* spp.), the pigeon guillemot (*Cepphus columba*), the herring gull (*Larus argentatus*), and the mew gull (*L. canus*) (NOAA Fisheries 2007). The California brown pelican (*Pelecanus occidentalis californicus*) can also frequent the study area, and osprey (*Pandion haliaetus*) is known to be present in the project area (NOAA Fisheries 2007). In 2014, an osprey nest was observed on top of the flour mill. More information on birds inhabiting the project area and potential project effects to birds is found above in Section 3.3.2, under the heading Terrestrial Biology.

Soft Sediment (Benthic) Habitat

Submerged Aquatic Plants

Several types of aquatic vegetation can also be found in or near the study area, including *Ulva/Enteromorpha* spp. on shallow mud flats and eelgrass (*Zostera marina*) (Merkel & Associates 2005). The largest eelgrass bed in San Francisco Bay is located between Point San Pablo and Point Pinole and covers more than 1,500 acres (Merkel & Associates 2010). Smaller beds are located at Point San Quentin and Point San Pedro (Merkel & Associates 2010). Submerged aquatic vegetation (SAV) and eelgrass beds in particular are important habitats within San Francisco Bay because they stabilize sediments, help clarify water through sediment trapping, cycle nutrients, and oxygenate water (Merkel & Associates 2005). SAV in San Francisco Bay has been poorly studied, and very little is known about its distribution and abundance. However, there are four main types of SAV communities known to inhabit the Bay: surfgrasses (*Phyllospadix torreyi* and *P. scouleri),*), eelgrass (*Zostera marina*), widgeon grass (*Ruppia maritime),* and sago pondweed (*Stuckenia pectinata*) (NOAA Fisheries 2007). Each species of SAV has varying physical requirements and is found in distinct parts of the Bay. All four SAV species provide primary productivity and decrease erosion by dampening wave action, preventing sediment resuspension, increasing sedimentation, providing attachment for sessile organisms, and providing a resource area for invertebrates, fishes, birds, and marine mammals. Most species of plants and algae need coarse particles such as pebbles or shells to become established in soft bottom habitats, otherwise they are removed by water motion such as tidal and wind currents as well as storm action. Eelgrass beds also provide habitat to an abundant array of invertebrates, fish, and birds. Eelgrass is a nursery habitat for most of the anadromous fish found in San Francisco Bay, including Chinook salmon, as well as sturgeon, striped bass, and smelt. Pacific herring use eelgrass beds to deposit their eggs during spawning (Merkel & Associates 2005). Likewise, many of the waterfowl present in the Bay use eelgrass beds for foraging such as black brant (*Branta bernicla nigricans*) (Merkel & Associates 2005). No submerged vegetation beds were observed in the subtidal or intertidal areas of the VMT Site (Appendix E-4, Appendix E-5).

Invertebrates

The nearshore subtidal region at the VMT Site is composed of soft mud, sand, and gravel (Appendix E-6). Based upon typical salinity concentrations at the VMT location, the marine environment can be characterized as either mesohaline (salinity concentrations between 5.0 to 18.0 parts per trillion (ppt) or polyhaline (salinity concentrations between 18.0 to 30.0 ppt) (NOAA Fisheries 2007, Appendix E-6). NOAA (2007) classifies the soft substrate benthic habitats present in the Bay–Delta in mesohaline and polyhaline environments as consisting of deep channels, channel edge, slough channels, and shallow subtidal. Only the deep channel, channel edge, and shallow subtidal habitats are present at the VMT Site (Appendix E-6).

In assessing the benthic habitat and associated invertebrate community at the VMT Site (Appendix E-6), Applied Marine Sciences (AMS) reported observing three benthic infaunal communities occupying the area. The first and shallowest infaunal community predominantly occupied the tidal mudflat located in the northeast corner of the offshore portion of the VMT Site and was observed in water depths ranging from 2.0 to 2.5 meters (6.7 to 8.2 feet). This infaunal community was comprised of 15 to 16 taxa with a total mean density of 5,530 individuals per square meter. The amphipods *Ampelisca abdita* and *Grandidierella japonica*, the cumacean *Nippoleucon hinumensis*, the polychaete *Streblospio benedicti*, tubificidae oligochaetes, and the bivalve clam *Potamocorbula amurensis* dominated this community. *A. abdita* and *N. hinumensis* numerically dominated the community making up more than 67% to 82% of the total abundance observed at the two sampled sites. The dominant taxa observed in this community were fairly evenly distributed between suspension feeders and surface deposit feeders.

The second benthic infaunal community occupied the region immediately adjacent to and north of the existing wharf in water depths ranging from 3.8 to 12.4 meters (12.5 to 40.7 feet) was comprised by 24 to 34 taxa with a total mean density of 4,289 individuals per square meter. This community was the most diverse infaunal community observed at the VMT Site. It was numerically dominated by the polychaetes *Polydora cornuta*, *Capitella capitata* (complex), and

Streblospio benedicti; the nudibranch *Okenia plana;* the amphipods *Incisocalliope derzhavini*, *Monocorophium acherusicum*, *Corophium heteroceratum*, *C. alienense*, *C. unidentified*, *Ampelisca abdita*, and *Grandidierella japonica;* the horseshoe worm *Phoronopsis harmeri;* annelid tubificidae worms; the Asian clam *Potamocorbula amurensis;* and the barnacles *Amphibalanus improvisus*, *Balanus crenatus* and *Balanomorpha unidentified*. The barnacles were observed attached to large gravel and pebbles located on the surface of most of the sample sites. The dominant taxa consisted of eight filter feeders, eight filter and deposit feeders, and one carnivore. The total abundance per meter square of seafloor for the second benthic infaunal community was slightly lower than observed at the first more shallow community described above, and was divided between more species.

The third benthic infaunal community was located in the natural river channel adjacent to the VMT Site in approximately 14 meters (42.7 feet) of water and was overwhelmingly dominated by the bivalve clam *Potamocorbula amurensis. Potamocorbula* accounted for 83% of the total individual abundance at this site. The third infaunal community consisted of 14 taxa with a total mean density of 4,413 individuals per square meter.

As observed at the VMT Site, the benthic infaunal community of North Bay and the Delta has been significantly affected by the introduction of exotic species. Most importantly, the establishment of two invasive clams, *Potamocorbula amurensis* and *Corbicula fluminea*, has drastically changed the benthic communities in San Pablo Bay, Suisun Bay, and the Delta (NOAA Fisheries 2007). In addition, the high water filtering rate of *P. amurensis* has been identified as one possible factor responsible for decreased plankton biomass in the Delta and North Bay (Thompson et al. 2008; Kimmerer 2006). Of the 54 taxa observed at the VMT Site, 16 are identified as non-native, and 7 of the 16 most numerically dominant taxa observed at the VMT Site, which accounted for 90.5% if the total number of individuals observed, are non-native species (Appendix E-6).

Large motile invertebrates common in the study area include Dungeness crab, blackspotted shrimp (*Crangon nigromaculata*), a gastropod snail (*Ilyanassa obsoleta*), the American spider crab (*Pyromaia tuberculata*) and the nudibranch (*Sakuraeolis enosimensis*) (NOAA Fisheries 2014). The non-native nudibranch, *Okenia plana*, was also observed as one of the most common and numerically dominant taxa by AMS during their assessment of the VMT Site (Appendix E-6). Dungeness crab use San Francisco Bay, as they do all estuaries along the north Pacific coast, as an area for juvenile growth and development prior to returning to the ocean as sexually mature adults (Tasto 1979; Pauley et al. 1989).

Fish

Many different fish species spend all or part of their life cycle in association with the demersal (seafloor) zone. The demersal (seafloor) region of the Napa River mouth is composed of 25 species of fish living in close association with the benthos during their sub-adult and adult life (Appendix E-4; IEP 2010–2012; AECOM 2013). Of these demersal species, Bay goby (*Lepidogobius lepidus*) is the dominant species comprising 29.9 % of the total fish abundance and English sole is the second most common species accounting for 22.5%. The following nine species collectively account for 43.5% of the species commonly inhabiting the seafloor and immediately adjacent waters in both the deep and shallow water regions of the Napa River mouth: Pacific staghorn sculpin, striped bass, yellowfin goby (*Acanthogobius flavimanus*), starry flounder, plainfin midshipman, speckled sanddab (*Citharichthys stigmaeus*), longfin smelt, Shokihaze goby (*Tridentiger barbatus*), and American shad (*Alosa sapidissima*). Additional demersal species that are present in low abundance include sand sole (*Psettichthys melanostictus*), cheekspot goby (*Ilypnus gilberti*), Shimofuri goby (*Tridentiger bifasciatus*), brown smoothhound (*Mustelus henlei*), California halibut (*Paralichthys californicus*), diamond turbot (*Hypsopsetta guttulata*), white croaker (*Genyonemus lineatus*), Pacific herring, shiner perch (*Cymatogaster aggregata*), Bay pipefish (*Syngnathus leptorhynchus*), river lamprey (*Lampetra ayresii*), white sturgeon (*Acipenser transmontanus*), green sturgeon and threespine stickleback.

Managed, protected, or other special-status fish species observed inhabiting the demersal zone near the project area include English sole, starry flounder, and sand sole. These three species are managed under the Pacific Groundfish FMP. The green sturgeon is an ESA threatened species and CESA species of special concern, and the river lamprey is a CESA species of special concern (IEP 2010–2012; AECOM 2013; CDFW 2014b).

San Pablo Bay – Hard Bottom (Benthic) Habitat

Algae and Invertebrates

Some near-shore hard bottom substrate can be found in the subtidal and intertidal area of the region and the project site. The intertidal hard bottom consists mostly of man-made hard bottom, which may extend into the subtidal area. Relatively little hard substrate occurs naturally in the estuary and around the project area (Goals Project 2000).

The shoreline habitat at the VMT Site consists primarily of cobble-sand-silt beaches with assorted quarry rock and concrete debris of assorted sizes armoring the shoreline bluff, with isolated rocks or concrete debris found lower in the intertidal area. Depending on the location of the hard substrate and its proximity to freshwater flow, San Pablo Bay can support several different communities of sessile invertebrates. In areas with lower salinity, the mussel *Mytilus trossulus/galloprovincialis* and the barnacle *Amphibalanus improvisus* are frequently observed organisms (NOAA Fisheries 2007). In the higher salinity regions of San Pablo Bay and the Carquinez Strait, the sessile invertebrate taxa are typically more diverse than what is observed in the lower salinity regions. This is the result of the more favorable salinity conditions enabling more marine species to establish and thrive (NOAA Fisheries 2007). This is what was observed during a survey of the intertidal habitat at the VMT Site (Appendix E-4). This site visit revealed that overall, there appears to be a single intertidal community inhabiting the upper and mid intertidal zones of the project site. This community is dominated by the algae *Ulva* spp. with colonial diatoms frequently occurring on the surface of rocks that are present in the mid intertidal zone. The invertebrate community in the mid intertidal zone was similar to the high zone with colonial diatoms and balanoid barnacles present throughout. Depending on the available bare rock space and the amount of crevices, the California mussel (*Mytilus californianus)* was also observed occurring occasionally in the riprap areas of survey segments. Both live and dead carapaces of the shore crab (*Hemigrapsus sanguineus*) were also observed. The low intertidal zone appeared to contain a similar diversity of species as the middle intertidal zone, including colonial diatoms and barnacles, depending on substrate type. In the lower intertidal zone, a few additional algae species were observed including under the pier, where predation and desiccation appears to be minimized during low tide cycles, the greatest diversity of taxa was observed. This area is the only location where evidence of the Olympia oyster (*Ostrea lurida (conchaphila))* was observed, with both live individuals and scars. The lower intertidal also contained *Fucus distichus*, which was the only abundant algae species documented in the lower intertidal. Encrusting turf, typically composed of tunicates, hydroids, bryozoans, and other encrusting species, was also observed in the low intertidal area under the pier. No eelgrass or other listed protected or special-status species were found anywhere along the shoreline of the VMT Site that was surveyed. The only invasive species observed were the hybrid Mytilus mussel (*Mytilus trossulus/ galloprovincialis*) and the Asian crab (*Hemigrapsus sanguineus*) that have become endemic to the entire San Francisco Bay–Delta.

The shoreline habitat at the proposed kayak launch site located at the City of Vallejo Municipal Marina consists primarily of small, quarried rock, ranging in size from 4 to 12 inches. The intertidal zone is divided up into three zones: high, mid, and low. The algae *Ulva* spp. was present throughout the high and mid intertidal zones with the mid zone containing moderate siltation on all the rocks (Appendix E-7). In additional to the dominant algae *Ulva* spp. in the mid intertidal zone, encrusting diatoms were also present. The low intertidal zone showed evidence of heavy siltation with encrusting diatoms being the dominant taxa, with the algae *Ulva* spp., an unidentified Serpulid worm (tube worm), and barnacles also being commonly observed (Appendix E-7). No special-status or sensitive species were observed in the survey area.

Sensitive Natural Communities

Sensitive communities in the project area include those that are especially diverse, regionally uncommon, designated by CDFW, or are otherwise covered by state, federal, or local regulations. CNDDB tracks the status of sensitive natural communities throughout California.

Designated Critical Habitat

The USFWS and NOAA Fisheries designate critical habitat with the purpose of contributing to the conservation of threatened and endangered species and the ecosystems upon which they depend. The designation of an area as critical habitat provides additional protection to habitat only when there is a federal nexus with regard to some aspect of a project, for example, when a federal agency is implementing or issuing a permit for a project. Critical habitat protection is only relevant when other statutory or regulatory protections, policies, or other factors relevant to agency decision-making would not prevent the destruction or adverse modification of habitat. Designation of critical habitat triggers the prohibition of destruction or adverse modification of that habitat, but it does not require specific actions to restore or improve habitat. The aquatic habitat adjacent to the VMT Site is within designated critical habitat for Central California Coast steelhead that includes, among other areas, the Napa River, Carquinez Strait, and San Pablo Bay. The VMT Site is adjacent to winter-run and spring-run Chinook salmon and green sturgeon designated critical habitat that includes, among other areas, Carquinez Strait and all waters of San Pablo Bay.

Designated Essential Fish Habitat

Designated essential fish habitat is defined as all habitat types that contain the waters and substrates necessary for fish spawning, breeding, or growth, as defined in the Magnuson–Stevens Fishery Conservation and Management Act. San Pablo Bay is designated as essential fish habitat for both Chinook and Coho Salmon (Stadler et al. 2011).

Special-Status Species

A number of species known to occur in the project vicinity are protected pursuant to federal and/or State of California endangered species laws, or have been designated as Species of Special Concern by CDFW. In addition, section 15380(b) of CEQA Guidelines provides a definition of rare, endangered, or threatened species that are not included in any listing. Species recognized under these terms are collectively referred to as “special-status species.” For the purposes of this Environmental Impact Report (EIR), special-status species include:

- Plant and wildlife species listed as rare, threatened, or endangered under the federal or state endangered species acts;

- Species that are candidates for listing under either federal or state law;
- Species formerly designated by the USFWS as Species of Concern or designated by CDFW as Species of Special Concern;
- Species protected by the federal Migratory Bird Treaty Act (16 U.S.C. 703 et seq.); and/or
- Species such as candidate species that may be considered rare or endangered pursuant to Section 15380(b) of the CEQA Guidelines.

Table 3.3-2 provides a comprehensive list of the fish and marine mammal special-status species that have been documented in, or have potential to occur in suitable habitat within the general project area. Other databases and informational tools used to determine whether special-status species have the potential to occur in the vicinity of the project include:

- The USFWS Official List of Federal Endangered and Threatened Species (USFWS 2015)
- The CDFW Wildlife Habitat Relationships database search
- The USFWS websites for special-status species

Based on review of the biological literature of the region, previous EIRs, surveys in the project vicinity, and an evaluation of the habitat conditions of the proposed project site, many of these species were eliminated from further evaluation because (1) the project site or the immediate area does not provide suitable habitat, or (2) the known range for a particular species is outside of the project site and/or the immediate area.

The special-status species list presented in Table 3.3-2 includes fish and marine mammal species for which potential habitat (i.e., general habitat types) occurs on or in the vicinity of the project site. Species for which generally suitable habitat occurs but that were nonetheless determined to have low potential to occur in the study area are also listed in Table 3.3-2. This table also provides the rationale for each potential-to-occur determination. Species observed or with a moderate to high potential-to-occur in the project area are discussed in further detail below.

Table 3.3-2
Special-Status Fish and Marine Mammal Species That May Occur Within the Waters of the Study Area

Common Name Scientific Name	**Listing Status**		**General Habitat**	**Potential for Species Occurrence Within Project Site**	**Time Period Present in Project Site Waters**
	Federal–ESA/ MMPA	*State–CESA*			
Sacramento River winter-run ESU Chinook salmon (*Oncorhynchus tshawytscha*)	FE/–	CE	Ocean waters, Sacramento and San Joaquin Rivers; migrates from ocean through San Francisco Bay–Delta to freshwater spawning grounds	Low potential to occur. This species could potentially be present and foraging in the Carquinez Strait near the project area during migration periods, but there is no evidence of their presence.	Adults – November and December Juveniles – fall and winter
Central Valley spring-run ESU Chinook salmon (*O. tshawytscha*)	FT/–	CT	Ocean waters, Sacramento and San Joaquin Rivers; migrates from ocean through San Francisco Bay–Delta to freshwater spawning grounds	Low potential to occur. This species could potentially be present and foraging in the Carquinez Strait near the project area during migration periods, but there is no evidence of their presence.	Adults – late winter to spring Juveniles – fall though spring
Central Valley fall-run/late fall-run Chinook salmon *(O. tshawytscha*).	FSC/–	–	Ocean waters, Sacramento and San Joaquin Rivers; migrates from Ocean through San Francisco Bay–Delta to freshwater spawning grounds, including the Napa River	High potential to occur. Given the project area's location along the main channel of the Napa River, both adults and juveniles of this species could be present in the project area during migration periods.	Adults – June through September Juveniles –- winter through summer
Central California Coast ESU Coho salmon (*Oncorhynchus kisutch*)	FE/–	CE	Ocean waters, Sacramento and San Joaquin Rivers; migrates from ocean through San Francisco Bay–Delta to freshwater spawning grounds	Unlikely to occur. This species may only be present in the project area if it were determined that they migrate higher up into the watershed.	Previously assumed to be extirpated from the Napa River but recent data suggests that Coho salmon might be present in the Napa River watershed.
Central Valley DPS steelhead trout *(O. Mykiss)*	*FT/–*	–	Ocean waters, Sacramento, San Joaquin, and Napa Rivers; migrates from ocean through San Francisco Bay–Delta to freshwater spawning grounds upriver	Low potential to occur. This species could potentially be present and foraging in the Carquinez Strait near the project area during migration periods, but there is no evidence of their presence.	Adults – winter and spring Juveniles – year-round

Table 3.3-2
Special-Status Fish and Marine Mammal Species That May Occur Within the Waters of the Study Area

Common Name **Scientific Name**	**Listing Status**		**General Habitat**	**Potential for Species Occurrence Within Project Site**	**Time Period Present in Project Site Waters**
	Federal–ESA/MMPA	*State–CESA*			
Central California Coast DPS steelhead trout *(O. mykiss)*	FT/–	CSC	Ocean waters, Sacramento and San Joaquin Rivers; migrates from Ocean through San Francisco Bay–Delta to freshwater spawning grounds	High potential to occur. Given the project area's location along the main channel of the Napa River, both adults and juveniles of this species could be present in the project area during migration periods.	Adults – winter Juveniles – year-round
Green sturgeon (Southern DPS) *(Acipenser medirostris)*	FT/–	CSC	Marine and estuarine environments and the Sacramento and Napa Rivers; all of San Francisco Bay–Delta	Moderate-high potential to occur. Critical habitat for the green sturgeon includes San Pablo and San Francisco Bays and they have been found in the stretch of the Napa river near the project area.	Year-round
Tidewater goby *(Eucyclogobius newberryi)*	FE/–	CSC	Coastal lagoons, estuaries, and marshes in coastal California from the Smith River (Del Norte County) to Aqua Hedionda Lagoon (San Diego County)	Unlikely to occur. This species is presumed to be extirpated from San Francisco Bay–Delta.	NA
Delta smelt *(Hypomesus transpacificus)*	FT/–	CE	Sacramento-San Joaquin Delta, Suisun Bay, San Pablo Bay, river channels and sloughs in Delta	Low-high potential to occur. This species is present in the project area in wet high-flow years and may not be present in low-flow years.	Delta smelt have been observed inhabiting the lower reaches of the Napa River, although their presence can be sporadic from year to year depending on how wet the rainy season is and the amount of flow in the river.
Longfin smelt *(Spirinchus thaleichthys)*	FC/–	CT	Throughout the nearshore coastal waters and open waters of San Francisco Bay–Delta including the river channels and sloughs of the Delta	Moderate-high potential to occur. The bulk of the San Francisco Bay population occupies the region between the Carquinez Strait and the Delta. Adults migrate from San Francisco and San Pablo Bays to the Delta to spawn.	Year-round

Table 3.3-2
Special-Status Fish and Marine Mammal Species That May Occur Within the Waters of the Study Area

Common Name Scientific Name	Listing Status		General Habitat	Potential for Species Occurrence Within Project Site	Time Period Present in Project Site Waters
	Federal–ESA/ MMPA	*State–CESA*			
River lamprey *(Lampetra ayresii)*	–/–	CSC	River lampreys are found in coastal streams in San Francisco Bay, San Pablo Bay and the Carquinez Strait.	Low-moderate potential to occur. During this species' spawning, adults have been observed in the Sonoma and Napa rivers. Individuals have also been caught in San Pablo Bay and the Carquinez Strait.	Year-round River lamprey spawn in small streams in April and May. During spawning run, adults are observed in the Sonoma and Napa rivers (UCSD 2014).
Sacramento splittail (*Pogonichthys macrolepidotus*)	–/–	CSC	Upper San Francisco Estuary, including the Sacramento-San Joaquin River Delta, and the Central Valley	Low to moderate potential to occur. This species has been observed in low numbers in San Pablo Bay and the Carquinez Strait and are reported to be present in both the Napa and Petaluma Rivers.	Splittail migrate upstream to freshwater rivers and floodplains for spawning in the winter and return to the more brackish water of the Delta and San Francisco Estuary in the spring and summer.
Harbor porpoise *(Phocoena phocoena)*	–/FP	–	An inshore species inhabiting shallow, coastal waters and occasional large rivers, including San Francisco Bay–Delta	Unlikely low potential to occur. This species has been observed irregularly in the Bay over recent years.	Year-round; although predominantly observed in Central San Francisco Bay, individuals have been observed in eastern San Pablo Bay and the lower reaches and mouth of the Napa River.
Pacific harbor seal (*Phoca vitulina*)	–/FP	–	Coastal waters, and throughout Bay–Delta	Moderate potential to occur. This species may forage in the vicinity of the project area, especially during steelhead and salmon migration periods.	Year-round; harbor seals forage throughout SF Bay–Delta and can be observed in San Pablo Bay and westward into the Delta, especially when salmon and steelhead are migrating through the area.
California sea lion (*Zalophus californianus*)	–/FP	–	Coastal waters, and throughout Bay–Delta	Moderate potential to occur. This species may forage in the waters of and adjacent to the project area.	Year-round; California sea lions forage throughout SF Bay–Delta and can be observed in San Pablo Bay and westward into the Delta, especially when salmon and steelhead are migrating through the area.

Table 3.3-2
Special-Status Fish and Marine Mammal Species That May Occur Within the Waters of the Study Area

Common Name Scientific Name	Listing Status		General Habitat	Potential for Species Occurrence Within Project Site	Time Period Present in Project Site Waters
	Federal–ESA/ MMPA	*State–CESA*			
Gray whale (*Eschrichtius robustus*)	FDL/FP	–	Predominantly coastal waters, although occasional individuals enter the Bay–Delta and have been observed swimming up the Sacramento River and into the South Bay	Unlikely low potential to occur. This species has been observed irregularly in the Bay over recent years.	December to April, during migration from Alaska to Baja California, occasionally enter Bay–Delta, transient
Humpback whale (*Megaptera novaeangliae*)	FE/FD	–	Predominantly coastal waters, although occasional individuals enter the Bay–Delta	Unlikely low potential to occur. This species has been observed irregularly in the Bay over recent years.	April to December, during migration, occasionally enter the Bay–Delta, transient

ESA = Federal Endangered Species Act
MMPA = Marine Mammal Protection Act
CESA = California Endangered Species Act

Federal (USFWS):
FDL = Delisted
FE = Listed as Endangered (in danger of extinction) by the federal government
FT = Listed as Threatened (likely to become Endangered within the foreseeable future) by the federal government
FP = Proposed for Listing as Endangered or Threatened
FC = Candidate to become a proposed species
FSC = Former Federal Species of Concern. The USFWS no longer lists Species of Concern but recommends that species considered to be at potential risk by a number of organizations and agencies be addressed during project environmental review. *NOAA Fisheries still lists Species of Concern.

State (CDFW):
CE = Listed as Endangered by the State of California
CT = Listed as Threatened by the State of California
CR = Listed as Rare by the State of California (plants only)
CSC = California Species of Special Concern

Federal (NOAA MMPA):
FD = Depleted Population
FP = Federally Protected

Sources: Bartling 2006; Bay Institute 2007; McGowan and Josselyn 2008; NCRCD 2012; Garza and Crandall 2013; 70 FR 52488 et seq.; NOAA Fisheries 2015; NOAA Fisheries 2009b; Sommer and Mejia 2013; USFWS 1989; 65 FR 7764–7787, USFWS 2015; USFWS 2013a; LSA 2009.

Of the special-status marine taxa presented in Table 3.3-2, only the marine species discussed in the following section were determined to have a moderate to high occurrence within the vicinity of project site, were fully considered in the impact analysis.

Central Valley Fall/Late Fall-Run Chinook Salmon

The population of Chinook salmon, also known as king salmon, in San Francisco Bay–Delta comprises three distinct runs: winter-run, spring-run, and fall/late fall-run (*Oncorhynchus tshawytscha*). These runs are distinguished by the seasonal differences in adult upstream migration, spawning, and juvenile downstream migration. Chinook salmon are anadromous fish, spending 3 to 5 years at sea before returning to freshwater to spawn. These fish pass through San Pablo Bay waters to reach their upstream spawning grounds. In addition, juvenile salmon migrate through the Bay to the Pacific Ocean.

The Central Valley fall/late fall-run Chinook salmon is a Species of Concern (NOAA Fisheries), and a California Species of Special Concern. These salmon enter the Sacramento and San Joaquin Rivers from June through December, spawning from October through December, with a peak in November.

Adult and juvenile (smolts) winter-run, spring-run, and fall/late-fall-run Chinook salmon are known to occur in San Pablo Bay and transit through the Carquinez Strait during migrations to and from upstream spawning habitat. Although principally found in the main channels, they can use adjacent shallows for foraging. Fish survey efforts in the Napa River have determined that fall-run Chinook salmon is the run found in the Napa River (NCRCD 2012). Given the project site location along the main channel of the Napa River at its mouth, fall-run adult and juvenile Chinook salmon must migrate past the project site.

Central California Coast Steelhead Trout

The Central California Coast steelhead trout (*O. mykiss*) is federally listed as threatened. Steelhead are rare in most streams that are tributary to San Francisco Bay and previously assumed to be extirpated from the Napa River. However, recent data documents the presence of Central California Coast Steelhead trout in the Napa River watershed (NCRDC 2012).

Central California Coast steelhead migrate from the Pacific coast through San Francisco Bay in the winter to spawn in freshwater in the upper Sacramento River (McEwan and Jackson 1996) and Napa River. Upstream migration occurs from December through May, and peak spawning occurs in April. Juveniles may spend a year or more in San Francisco Bay before moving on to the ocean.

Critical habitat includes all river reaches and estuarine areas accessible to listed steelhead in coastal river basins, from the Russian River to Aptos Creek (inclusive), and the drainages of San Francisco and San Pablo Bays. Also included are adjacent riparian zones, all waters of San Pablo Bay west of the Carquinez Bridge, and all waters of San Francisco Bay to the Golden Gate (65 FR 7764–7787).

Green Sturgeon

The green sturgeon (*Acipenser medirostris*), an anadromous fish, is the most widely distributed member of the sturgeon family and the most marine-oriented. It is a federally listed threatened species and a California Species of Special Concern. Green sturgeon is found in nearshore waters, ranging from Mexico to the Bering Sea and are common occupants of bays and estuaries along the western coast of the United States (Moyle et al. 1995). Adults in the San Joaquin Delta are reported to feed on benthic invertebrates including shrimp, amphipods, and occasionally small fish (Moyle et al. 1995), while juveniles have been reported to feed on opossum shrimp and amphipods. Adult green sturgeons migrate into freshwater beginning in late February with spawning occurring in March through July and peak activity in April and June. After spawning, juveniles remain in fresh and estuarine waters for 1 to 4 years and then begin to migrate out to sea (Moyle et al. 1995). Critical habitat for the green sturgeon includes the Sacramento River; the Sacramento-San Joaquin Delta; and Suisun, San Pablo, and San Francisco Bays (74 FR 52300–52351). The upper Sacramento River has been identified as the only known spawning habitat for green sturgeon in the southern DPS. Although green sturgeon is caught and observed in the lower San Joaquin River, no spawning is known to occur within the river. The California Department of Fish and Game (now CDFW) CDFG Interagency Ecological Program (2000–2007) data indicate that green sturgeon are not frequent or significant inhabitants of the area of San Pablo Bay where the project is located; however, they do occur within the shallows and use the navigation channel to migrate between the ocean and the Sacramento River. It was previously assumed that green sturgeon were no longer present in the Napa River watershed, but recent evidence has established that they are present in both the upper reaches and the lower mouth of the Napa River (AECOM 2013; Ducks Unlimited 2014).

Delta Smelt

The delta smelt (*Hypomesus transpacificus*), a federally threatened (recently nominated as endangered) and a state endangered species, is a small slender-bodied fish native to the Sacramento-San Joaquin estuary. This species is able to tolerate a wide salinity range. The fish live in schools and primarily feed on planktonic crustaceans, small insect larvae, and mysid shrimp (Moyle 2002). This species, which typically has a 1-year life span, lives primarily along the freshwater edge of the saltwater-freshwater interface of the Sacramento-San Joaquin Delta. Prior to spawning, delta smelt migrate upstream from the brackish-water habitat to river channels and tidally influenced backwater sloughs to spawn. Migration and spawning occur between December and June (Moyle 2002). The species has been collected in large quantities in Suisun and San Pablo Bays, although their presence west of the Carquinez Strait is directly related to increased freshwater flow through the delta and reduced salinity concentrations. The delta smelt has no commercial or recreational value, but is considered a key indicator species of the environmental health of the Delta. Delta smelt have been reported to occur in both the upper and lower segments of the Napa River, although their numbers and presence are a function of freshwater flow and seasonal rainfall (Bay Institute 2007; Sommer and Mejia 2013).

Longfin Smelt

The longfin smelt (*Spirinchus thaleichthys*), a California threatened species (and proposed for listing by ESA), is a small schooling fish that inhabits the freshwater section of the lower Delta. It has been observed from south San Francisco Bay to the Delta, with the bulk of the San Francisco Bay population occupying the region between the Carquinez Strait and the Delta (McAllister 1963; Miller and Lea 1972). They have been collected in large numbers in Montezuma slough, Suisun Bay, and near the Pittsburg and Contra Costa power plants. In the fall, adults from San Francisco and San Pablo Bays migrate to fresher water in the Delta to spawn. The spawning habits of longfin smelt are similar to the delta smelt, and the species are known to school together. Larval stages are known to inhabit Suisun Bay and move south within the Bay–Delta as they grow larger in April and May (Ganssle 1966). The larvae are pelagic and found in the upper layers of the water column. CDFG Interagency Ecological Program Data (2010-2012) indicate that longfin smelt is one of the more common species comprising the pelagic and demersal fish populations in the region of San Pablo Bay adjacent to the project area. High larval densities of longfin smelt have also been observed in the Napa River and are likely a result of both local spawning in wet years and tidal effects pushing larvae that hatched in the Delta or Suisun Bay into the lower Napa River system, including the project site (Robinson and Greenfield 2011).

Pacific Harbor Seal

The Pacific harbor seal (*Phoca vitulina*) is protected by the MMPA. It is a common resident marine mammal along the west coast. They prefer to stay close to shore in sub- and inter-tidal habitats such as bays and estuaries, but occasionally venture into rivers. Groupings of various sizes can haul out on rocks, mudflats, and sandy/cobble coves (Zeiner et al. 1990). In general, the same sites are used over many years (Kopec and Harvey 1995). They have been observed as far upstream in the Delta and Sacramento River as the City of Sacramento, though their use of the habitat north of Suisun Bay is irregular (Goals Project 2000). Pacific harbor seals in the Bay feed on yellowfin goby, northern anchovy, Pacific herring, staghorn sculpin, plainfin midshipman, and white croaker (Torok 1994). They may forage in the vicinity of the VMT Site, especially during steelhead and salmon migration time.

California Sea Lion

Like the harbor seal, the California sea lion (*Zalophus californianus*) is a permanent resident in the San Francisco Bay–Delta and protected by the MMPA. A common, abundant marine mammal, they are found throughout the West Coast, generally within 10 miles of shore. They breed in Southern California and the Channel Islands, after which they migrate up the Pacific coast to the Bay. They haul out on offshore rocks, sandy beaches, and floating docks, wharfs, vessels, and other man-made structures in the Bay and coastal waters of the state. California sea lions feed on a wide variety of seafood, mainly squid and fish and sometimes even clams. Commonly eaten fish and squid species include salmon and hake (*Merluccius productus*) (NOAA Fisheries 2014; Weise and Harvey 1999). Sea lions may forage in the waters of and adjacent to the project area.

Pacific Herring

Pacific herring (*Clupea pallasi*) is neither a protected species under the ESA or CESA, nor a managed fish species under the Magnuson–Stevens Act. Pacific herring does, however, represent a species of special concern for San Francisco Bay since it is an important member of the San Francisco Bay marine ecosystem; provides an important food source for marine mammals, sea birds, and fish; and constitutes a state fishery that is entirely conducted within an urban estuary, making it particularly susceptible to anthropogenic impacts. As a state fishery it is regulated under Sections 8550–8559 of the California Fish and Game Code.

Pacific herring are found throughout the coastal zone from northern Baja California northward around the rim of the North Pacific Basin to Korea. In California, herring forage offshore during spring and summer and then migrate inshore to bays and estuaries to spawn from October through April. Known spawning areas in California include San Diego Bay, the San Luis River, Morro Bay, Elkhorn Slough, San Francisco Bay, Tomales Bay, Bodega Bay, the Russian River, the Noyo River, Shelter Cove, Humboldt Bay, and Crescent City Harbor (Bartling 2006). The largest spawning aggregations in California occur in the San Francisco Bay–Delta and Tomales Bay. Most spawning areas are characterized as having reduced salinity with calm and protected waters. Spawning-substrate such as submerged aquatic vegetation beds, especially eelgrass beds, or rocky intertidal areas are preferred, but man-made structures such as pier pilings and riprap are also frequently used spawning substrates in San Francisco Bay (Bartling 2006). After hatching, herring fry and juveniles use nearby protected inshore waters for rearing habitat (Lassuy 1989).

Managed U.S. Fisheries Species

Under the Magnuson–Stevens Act (see Section 3.3.1 for description), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104–297), the NOAA Fisheries, Fishery Management Councils, and federal agencies are required to cooperatively protect essential fish habitat for commercially important fish species such as Pacific coast groundfish, three species of salmon, and five species of coastal pelagic fish and squid. As defined by the Act, essential fish habitat includes "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity."

Northern anchovy is the only Magnuson–Stevens Act species present in the project area that is managed under the Coastal Pelagic Fish Management Plan ((IEP 2010-2012; USACE and EPA 2009) and English sole, starry flounder, and sand sole are the only demersal fish species managed under the Pacific Groundfish FMP (USACE and EPA 2009). Both Chinook and Coho salmon species are managed under the Pacific Coast Salmon Fishery Management Plan.

Non-native and Non-indigenous Species

New species of estuarine and marine animals are inadvertently or intentionally introduced into California waters regularly. Often referred to as introduced, non-indigenous, alien, non-native, or exotic species, most pose little or no threat to native ecosystems or biological communities. However, a few have the potential to severely disrupt local ecosystems, fisheries, and human infrastructure (Ray 2005).

The San Francisco Bay–Delta has more than 230 identified non-native taxa inhabiting its estuarine and marine waters and has been described as the most invaded estuary in North America (Ray 2005). It is currently estimated that a new aquatic species is introduced into the San Francisco Bay–Delta every 14 weeks, whereas prior to 1960 the rate was once every 55 weeks (Roman 2010). Introduced species now dominate all benthic communities within the Bay–Delta and make up more than 95% of the biomass and total abundance of organisms (Roman 2010). Estuaries and sheltered coastal areas appear to be among the most invaded habitats as a result of being naturally disturbed, low-diversity systems with historic centers of anthropogenic disturbance from shipping, industrial development, and urbanization (Ray 2005).

Non-native organisms are introduced by a variety of methods, the most prevalent being shipping. Primary methods of introduction have included ballast water and fouling organisms that have attached themselves to ship hulls, anchors, and anchor chains (Hewitt and Campbell 2010), such as Asian kelp (*Undaria pinnatifidum*). In recent years, the introduction of non-native species into Bay waters from ballast water has been substantially reduced as a result of increased regulations and monitoring to prevent ballast water exchanges in state waters and harbors. Additional sources of introduction include recovered flotsam, "live" rock and plants from the aquarium trade, the accidental release of animals from packing materials by restaurants serving live seafood, and the live bait industry (Ray 2005). In addition, many invasive species, such as striped bass, channel and white catfish (*Ictalurus punctatus* and *Ameiurus catus*), and giant pacific oysters (*Crassostrea gigas*), have been deliberately introduced into California waters. A few of the most damaging in the San Francisco Bay–Delta include the Chinese mitten crab (*Eriocheir sinensis*), the European green crab (*Carcinus maenas*), the Asian shore crab (*Hemigrapsus sanguineus*), the Asian clam (*Potamocorbula amurensis*), and an isopod (*Sphaeroma quoyanun*). The Chinese mitten crab is found throughout the Bay–Delta and is displacing native intertidal crabs. The Asian clam has completely changed the subtidal benthic infaunal community in the western Delta, and because of its voracious feeding on bacterioplankton, phytoplankton, and copepod larvae, it has been identified as one of the potential causes of reduced zooplankton and fish abundances and distributions in the Delta (Ray 2005; Kimmerer 2006; Thompson and Parchaso 2003), especially delta and longfin smelt populations in the Bay–Delta (AFS 2007).

Analysis of the dominant marine species observed inhabiting the subtidal and intertidal habitats of the VMT Site reveals that 44% of the species observed inhabiting the subtidal sediments and 18% of the species observed inhabiting the intertidal habitat were non-native species (Appendix E-6, Appendix E-7).

3.3.3 Thresholds of Significance

The following criteria, included in Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.), will be used to determine the significance of potential terrestrial and marine biological resources impacts. Impacts to biological resources would be significant if the proposed project would:

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

B) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or 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, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;

D) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites; or

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

The impact analysis addresses construction and operation of the VMT project component and the Orem project component separately, if required. Otherwise footprint-related effects of project construction are not unique to one project component versus another.

3.3.4 Impact Discussion

A) Would the project 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?

Terrestrial Biological Resources

VMT and Orcem Project Analysis

Construction Impacts

While the biological assessment prepared for the project site determined that there is low potential for special-status species of birds to nest within the project site, project construction of both the VMT and Orcem project components could disturb breeding and nesting behaviors of special-status species of birds, as well as common raptor and passerine species protected by the MBTA if these species are present and if construction occurs during the typical breeding season (February 15 through August 31). Additionally, an active osprey nest was identified on top of the flour mill building in April 2014. The abandoned osprey nest will be removed during the non-nesting season after consultation with CDFW. Since this species typically returns to a nest site for several years, there is the possibility that the osprey would return to the site. Take of any active raptor nest is prohibited under Fish and Game Code Section 3503.5 and would be a **significant impact** (**Impact 3.3-1**) if project implementation disturbs an active nest. Mitigation measures to avoid a take of active nests are identified in Section 3.3.5.

Townsend’s big-eared bat (*Corynorhinus townsendii*) has been proposed as a candidate for state listing as a threatened species. Townsend’s big-eared bat is very sensitive to human disturbance and is not known to occur on the project site; the project site is regularly disturbed by human activity, and suitable day roosts are not available in the project area (see Appendix E-1). While the site may not offer optimal roost sites for this species, Townsend’s big-eared bat commonly roosts in abandoned buildings; therefore use of the buildings on the project site cannot be entirely discounted. The project site has been vacant for approximately 10 years and has been subject to minimal disturbance, human or otherwise, over that time. While it is unlikely that this species or roost sites would be found on the project site, disturbance of roost sites would be a **significant impact** (**Impact 3.3-2**). Mitigation measures to avoid disturbance to this species are identified in Section 3.3-5.

Operational Impacts

Operation of the proposed project would require ship, rail car, truck, and heavy equipment operations within the area of the existing developed site and developed off-site areas. It is anticipated that disturbance associated with project operation would deter special-status species from using the project site and that any use of the site by special-status species would be by species adapted to human presence and disturbance or within portions of the project site farther from project activities, such as the bluffs or shoreline areas unaffected by the proposed project. It is anticipated that impacts to special-status species associated with operation of the project would be **less than significant**.

Impacts to Marine/Aquatic Biological Resources

VMT Analysis

Construction Impacts

The VMT project component would involve multiple in-water construction activities that have the potential to directly and indirectly affect protected and special-status marine species listed above. Proposed redevelopment of the decaying wharf and waterfront area of the VMT Site would include the following.

Phase 1 Wharf Redevelopment

- Dredging approximately 89,800 cubic yards of sediment between the reconstructed Phase 1 wharf and the existing deep-water channel
- Approximately 10,300 cubic yards (cyd) of fill, the majority of which would be placed within the footprint of the existing wharf
- Approximately 10,900 cyd of grading fill to bring the finished elevation to +11.5 feet mean lower low water as needed for the proposed stormwater control plan.
- Removal of approximately 444 decaying creosote and concrete-jacketed creosote wood pilings
- Installation of eighty-one (81) 24-inch concrete pilings for the new wharf
- Installation of eight 30-inch steel pilings to support mooring equipment installation
- Installation of approximately 600 feet of steel sheet pile

- Construction of a 29-foot-wide, 500-foot-long concrete wharf
- Reconstruction of approximately 50,453 square feet of existing shoreline fronting the Phase 1 wharf with the addition of engineered fill and rocky riprap armoring
- Use of reclaimed concrete from on-site demolition for use as engineered fill

__Phase 2 Dike Construction__

- Dredging approximately 46,500 cubic yards of marine sediments to provide a deeper channel adjacent to the Phase 2 dike and the existing deep-water channel of the Napa River
- Construction of approximately 600-feet of rock dike
- Installation of twelve (12) 36-inch steel pipe mooring piles
- Alteration of the existing shoreline along the northwest corner of the VMT Site by constructing a new rock dike and the permanent infilling of approximately 106,040 square feet of existing Bay–Delta waters with 15,800 cubic yards of engineered fill
- Use of reclaimed concrete from on-site demolition and dredged sediments for use as engineered fill
- Potential reuse of reclaimed concrete for other undefined on-site construction activities

__Off-Site Public Launch Ramp – Vallejo Municipal Marina__

- Construction of a 10-foot-wide by 60-foot-long articulated concrete mat boat ramp with riprap reinforcement at the City of Vallejo Municipal Marina for self-propelled boats
- Removal of 1,080 square feet (0.025 acre) of existing artificial rocky intertidal habitat

In addition to the in-water construction activities, onshore construction, equipment and material staging, and on-site demolition activities also have the potential to result in short-term impacts to marine habitats and associated biota, including special-status species through the accidental release of hydrocarbons (fuel, lubricating oils, hydraulic fluids), site trash and packing materials, and uncontrolled stormwater and on-site dust control water finding its way into the water.

The open water (pelagic) and soft subsurface sediment (demersal) areas of the Napa River adjacent to and part of the VMT Site are utilized by Chinook salmon (Central Valley fall-run and late fall-run), steelhead trout (Central California Coast), longfin smelt, delta smelt, and Sacramento splittail for foraging and access to spawning grounds upstream. Longfin smelt and green sturgeon utilize the area for foraging. As such, the presence of most of these species is limited to seasonal migration periods, and in the case of delta smelt and Sacramento splittail, to wet winters when salinity concentrations in the lower Napa River decrease (Bay Institute 2007; LSA 2009; Merz et al. 2011; Sommer and Mejia 2013).

The lower Napa River and San Pablo Bay are also listed as essential fish habitat for the five identified FMP-managed fish taxa. Pacific harbor seals and California sea lions can be observed in the lower Napa River year-round for short periods of time, but are most prevalent in the area during salmon and steelhead migration periods.

The proposed VMT in-water project activities would result in the following ecological effects:

- Proposed dredging would result in the temporary loss of foraging habitat for some fish and marine mammal species, cause short-term and localized increased water turbidity and exposure to sediment-affiliated organic and inorganic contaminants from resuspended sediments, and could entrain[2] fish.
- Modifications to the existing shoreline by renovating the rock dike/shoreline armoring as part of the Phase 1 wharf reconstruction, the burial of the existing rock and beach shoreline at the Phase 2 dike construction location, and the removal of 0.25 acre of shoreline armoring and soft bottom sediment for the construction of a self-propelled boat ramp at the City of Vallejo Municipal Marina would result in the temporary loss of existing intertidal hard substrate habitat and the permanent loss of subtidal soft substrate habitat and their associated marine communities which are used as fish forage.
- The establishment of the Phase 2 dike waterfront, extending up to 200 feet into the Napa River, would result in the temporary or permanent loss of 106,040 square feet of combined rocky intertidal, sandy beach intertidal, tidal mudflat, and subtidal soft substrate benthic habitat and associated marine communities, which serve as fish forage.
- Removal of decaying creosote pilings would result in the temporary gain of 832 square feet (0.011 acre) of intertidal and subtidal artificial hard substrate habitat and attached invertebrate communities that serve as fish forage habitat.
- Removal of decaying creosote pilings would result in resuspended contaminated sediment and release of toxic piling fragments into the water column and exposing fish and invertebrate taxa which can be fatal and/or harmful to marine invertebrates, fish, and marine mammals.
- Installation of 24-inch concrete and 30-inch and 36-inch steel piles would result in the permanent loss of approximately 0.009 acre of subtidal habitat and associated marine community that is used for fish forage.
- Resuspension of sediment from dredging and the construction of an overwater wharf would result in both temporary and permanent shading, respectively of Bay–Delta waters

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[2] Entrainment is defined as the direct uptake or capture of aquatic organisms by the dredge clamshell or suction head.

and possibly reduced plankton productivity and effects on planktivorous fish such as longfin and delta smelt and Sacramento splittail.

- Installation of 24-inch concrete pilings, 30-inch and 36-inch steel pilings, and steel sheet piling for wharf construction could result in increased noise levels that can be fatal and/or harmful to fish and marine mammals.

The following discussions address the potential effect of these project-related ecological changes on project area marine habitats and their potential impact on identified sensitive species.

Disturbed and Lost Habitat

Table 3.3-3 summarizes the estimated Napa River acreage that would be affected by VMT in-water construction. Dredging for the Phase 1 wharf and Phase 2 dike construction would result in the short-term loss of an estimated 2.73 acres (Appendix E-6) of unconsolidated sand-silt-clay substrate essential fish habitat/critical habitat and associated benthic infaunal community. The placement of concrete and steel pilings would result in the loss of approximately 0.009 acre of essential fish habitat/critical habitat. Removal of the existing 444 on-site wood creosote pilings would result in the return of approximately 0.011 acre of Bay–Delta subtidal habitat or a net gain of 0.02 acre from pilings. Alterations to the existing shoreline would result in the loss of approximately 1,400 linear feet of existing artificial rocky intertidal habitat and 800 linear feet of sandy beach intertidal habitat. The lost rocky intertidal habitat would be replaced with approximately the same length of artificial rocky intertidal (1,280 feet) and the addition of approximately 650 feet of subtidal artificial rocky habitat that is not currently present at the site. Additionally, construction of the wharf and dike would result in the loss of approximately 2.7 acres of nearshore intertidal, subtidal and tidal mudflat under new fill within the project site. To accommodate the installation of the 10 foot by 60 foot self-propelled boat launch at the City of Vallejo Municipal Marina, existing artificial rock armoring would be removed along an 18-foot-wide path through the existing shoreline rock armoring at the Marina. The rock armoring would be replaced within the 18-foot-wide path and along both sides of the concrete boat launch once the articulated concrete pad is installed. Portions of the articulated concrete launch ramp would be placed above and below the existing rock armoring. Approximately 5 to 10 feet of existing soft substrate harbor bottom will be covered with the concrete mat.

Total short and long-term habitat loss from VMT construction (including dredging, pilings, shoreline modification, in-Bay fill) is estimated at 14.84 acres, with 2.74 acres being permanent from Bay infill and 12.1 acres being temporary from dredging. Total short- and long-term habitat loss from the construction of the proposed public launch ramp at the City of Vallejo Municipal Marina would be < 0.25 acre.

Altering benthic habitat and associated infaunal and epifaunal communities can result in the loss or reduction of habitat suitable for fish foraging, especially for sensitive species including salmon, steelhead, green sturgeon, and groundfish. The current benthic community inhabiting the project site includes assorted amphipods, polychaetes, mollusks, and gastropods that are common fish forage, especially the mollusks by green sturgeon (74 FR 52300–52351). Green sturgeon is known to feed upon opossum shrimps (*Neomysis mercedis* and *N. awatschensis*), the amphipod *Corophium*, the annelid worms, California bay shrimp (*Crangon franciscorum*), the isopod *Synidotea laticauda*, the Asian clam (*Corbicula fluminea*), and the gastropod *Olivella baetica* (EPIC 2001). Only the amphipod *Corophium* was reported to be part of the benthic infaunal community at the VMT Site (Appendix E-6).

The benthic infaunal community inhabiting the VMT Site is also consistent in composition with those reported by NOAA (NOAA Fisheries 2007) as inhabiting polyhaline (salinities in the 18.0–30.0 ppt range) and mesohaline (salinities in the 5.0–18.0 ppt range) environments (Appendix E-6). AMS (Appendix E-6) reported that of the 16 most abundant taxa observed at the VMT Site, NOAA listed 14 as key taxa that characterized channel, channel edge, and shallow subtidal habitats in polyhaline and mesohaline environments. Additionally, the low intertidal and subtidal area of the Napa River to be filled as part of the Phase 2 dike construction consists predominantly of a tidal mudflat that does not currently support eelgrass, widgeon grass, or other submerged aquatic vegetation (Appendix E-6).

The rocky intertidal armoring at the City of Vallejo Municipal Marina location for the proposed public launch facility supports a much more limited intertidal community than present at the VMT Site. Heavy siltation on the rocks has severely limited the attachment and growth of a robust intertidal invertebrate and algal community (Appendix E-7).

The proposed project, including its off-site improvements at the Marina, would result in permanent loss of approximately 2.75 acres of subtidal soft substrate habitat to Bay infill to build the VMT facility, the temporary loss of 12.1 acres to periodic dredging, and the loss of >0.25 acre of rocky intertidal habitat at the City of Vallejo Municipal Marina would. However, there are several factors that would be considered in assessing the overall impact of this action. The low suitability of the substrate to provide fish forage for protected and special-status fish species combined with the absence of any submerged aquatic vegetation (e.g., eelgrass or widgeon grass) combined with the positive effects of the removal of toxic creosote pilings, the creation of an additional 800 feet of subtidal and intertidal rocky habitat (approximately 0.92 acre of new subtidal hard substrate habitat), and the replacement of rocky intertidal habitat at the City of Vallejo Municipal, results in a determination that the potential impact from subtidal soft substrate habitat loss from VMT construction activities and dredging would be **less than significant.**

Table 3.3-3
In-Water Acreage of the Napa River Affected by the VMT Project Component

		Acreage			Feet	Cubic Yards
In-Water Construction Location	**Activity**	*Fill (Above and Below Mean High Water Mark)*	*Lost Marine Habitat (To Bay Fill or Dredging)*	*Shading*	*Shoreline Change*	*Dredged Sediments*
VMT Phase 1 Wharf	Redeveloped shoreline	3.51	1.03	—	600	27,600
	Wharf decking	—		0.33	—	—
	Pilings	0.007	0.007	—	—	—
	Dredged Channel	—	9.5	—	—	62,200
VMT Phase 2 Dike	Redeveloped shoreline (lost intertidal and subtidal habitat*)*	2.43	1.7	—	800	12,900
	Wharf decking	—	—	—	—	—
	Pilings	0.002	0.002	—	—	—
	Dredged Channel	—	2.6	—	—	33,652
City of Vallejo Municipal Marina Self-Propelled Boat Ramp	Boat Ramp Installation	<0.25	<0.005	—	18	—

Source: Appendix E-6
Note: All quantities are estimated maximums.

The loss of approximately 1,400 linear feet of artificial hard substrate in the high to low intertidal zone and 600 linear feet in the shallow subtidal zone, combined with the loss of intertidal and subtidal artificial hard substrate from the removal of approximately 444 creosote pilings, would result in the temporary loss of limited hard substrate habitat which supports a unique and vital community in the San Francisco Bay–Delta (SFBSHGP 2010). Hard substrate habitat supports a community of sessile organisms, including the native Olympia oyster, which provides important forage for many species of fish, birds, and megabenthic invertebrates. The intertidal community observed inhabiting the VMT Site predominantly consists of colonial diatoms, the algae *Ulva* spp. and *Fucus distichus*, barnacles, mussels, the Asian shore crab (*Hemigrapsus sanguineus)*, and the native Olympia oyster (Appendix E-4).

Removal or burial of the intertidal hard substrate and the existing wood pilings would result in the complete loss of any associated flora or fauna. Although this loss would be temporary in nature until the new rock armoring/riprap and wharf pilings are installed, it would require some time, possibly a year or more to recover to pre-disturbance conditions. The relocation of the rocky intertidal area at the proposed Phase 2 dike location would result in increased subtidal artificial hard substrate (approximately 800 linear feet of intertidal hard substrate and 0.91 acre of subtidal hard substrate) that is not currently present at that location. Choice of material for use in armoring the shoreline is also important and can have an effect on the speed of recovery, the taxa colonizing the hard substrate, and the long-term stability of the structure and the type of habitat it provides (Figley 2003; Anderson et al. 2009). The placement of overlapping armoring along sloping shorelines provides increased colonizing surface area and protected habitat not provided by flat hard substrate surfaces that results in increased taxonomic diversity, abundances, and taxonomic presence than typically provided by flat hard substrate surfaces such as steel sheet piling, concrete break walls, and rock cliffs (AMS 2009).

It can be anticipated that the marine biota expected to inhabit the new artificial hard substrate habitats at the VMT Site would consist, at a minimum, of the same species inhabiting the existing middle and lower rocky intertidal and near subtidal habitats. It can also be anticipated that the increased intertidal and shallow subtidal hard substrate habitat provided by the new VMT wharf and dike and shoreline modifications would have the potential to increase the diversity and abundance of the sessile community inhabiting it compared to the existing community present. Additionally, the shaded intertidal area, estimated at approximately 0.33 acre, provided by the new wharf and dike, compared to the existing estimated 0.09 acre of the remaining deteriorated wharf, can be expected to provide additional protected habitat for native Olympia oysters, since the only location AMS observed Olympia oysters at the VMT Site was underneath the existing pier/wharf (Appendix E-4).

The temporary loss of 600 linear feet of lower and middle intertidal and subtidal artificial hard substrate and associated biota as a result of the deconstruction of the existing wharf and construction of the new wharf and dike at the VMT Site, when combined with the addition of approximately 800 linear feet (0.92 acre) of middle and lower intertidal and subtidal artificial hard substrate and the creation of additional intertidal and subtidal hard substrate habitat, would potentially support a more diverse and abundant biological community, including providing more habitat for native Olympia oysters and other species, which could be expected to provide improved fish foraging. The impact would be **less than significant**. These elements of the project may be subject to additional mitigation as part of the BCDC permitting process.

Additionally, the permanent loss of the artificial hard substrate caused by removing the existing 444 creosote wood pilings (0.019 acre) would be **less than significant** since they would be replaced with 101 concrete and steel pilings, which will be less toxic to marine life, longer lasting, subject to less physical disturbance and damage, and will provide an estimated 0.24 acre (a slight increase in surface area) of similar artificial hard substrate habitat for colonizing as the current pilings. In addition, the removal of this subtidal artificial subtidal habitat provided by the removed creosote pilings is further offset by the addition of 0.92 acre of new subtidal rocky substrate in the Phase 2 dike.

Exposure to Contaminants from Bay Sediments, Recycled Concrete, Creosote Pilings, and Construction Debris

The presence of organic or inorganic contaminants in Bay–Delta sediments at concentrations high enough to result in detectable increased loading of contaminants to Bay–Delta waters and therefore pose a threat to marine biota inhabiting the project site is not expected, either from dredging activities or placement/removal of pilings. Additionally, any reused concrete for engineered fill is expected to be contaminant free and therein pose little to no threat of contaminant exposure to marine resources, as discussed in Section 3.7, Hazards and Hazardous Materials.

As discussed in Section 3.8, Hydrology and Water Quality, only surface sediments have been tested for organic and inorganic contaminants, but no sediment cores or analysis of potential dredged sediment has occurred. As part of the permitting process for dredging these sediments, representative samples would be collected for physical, chemical, toxicity, and bioaccumulation to assess the quality of sediment and determine the suitability for each disposal option permitted. Under the proposed project, dredged sediments may be disposed in the Bay, but if they meet state and federal criteria for beneficial reuse would be dried and mixed with reclaimed and properly sized concrete to produce engineered fill which would be used to construct the new Phase 1 wharf and Phase 2 dike. If analytical analysis shows that either organic or inorganic contaminants are present in sediments at unacceptable concentrations for any aquatic or beneficial reuse site, adherence to the Long-Term Management Strategy (LTMS)-required best management practices (BMPs) for dredging and disposal procedures (e.g., use of silt curtains, upland disposal) would ensure that any potential impact from the resuspension or leaching of organic or inorganic contaminants from dredging or dredging materials would result in **less-than-significant** impacts. Additionally, implementation of mitigation measures MM-3.8-1 and MM-3.8-2, described in Section 3.8, Hydrology and Water Quality, would ensure that both dredged sediments and any reclaimed and reused concrete would be adequately tested and certified to be free of potentially harmful contaminants before being reused in construction of both the Phase 1 wharf and Phase 2 dike.

The removal of derelict creosote pilings in the Bay–Delta results in the loss of low quality and continually degrading artificial subtidal and intertidal hard substrate habitat that poses potential toxicity issues to marine invertebrates and fish, especially Pacific herring, a species of special concern, as well as to the survivability of their eggs (Vines et al. 2009). The potential impact to the marine benthic community inhabiting the sediments in close proximity to these creosote pilings from polyaromatic compounds poses potentially greater risk to the quality of the fish foraging habitat for protected and MSA-listed fish (Stratus Consulting 2006; EPA 2008). The potential impact to subtidal habitats and special-status taxa from their presence is reduced with the removal of these structures. The San Francisco Bay Subtidal Habitat Goals Project

(SFBSHGP 2011) identified critical advantages in the removal of derelict creosote pilings in the Bay–Delta to include:

- Reduced substrate for introduced species
- Reduced shading of the bottom and water column
- Reduced toxic effects of creosote and other contaminants
- Reduced restrictions to flow and sediment movement
- Restoration, re-creation, or realignment of intertidal mudflats, sand flats, rock, and shellfish, eelgrass, and SAV beds

They further identified potential disadvantages to be:

- Disruption during removal (physical damage, turbidity, and release of toxic compounds)
- Reduced habitat for fish and invertebrates including native oysters
- Reduced resting or nesting sites for birds

Critical to the prevention of increased contaminant exposure to marine taxa by removing creosote pilings, is the operational approach employed in their removal. Use of excavators, backhoes, and other mechanical means to physically grab onto and attempt to free the piling from the seafloor generally results in the piling disintegrating into wood fragments, exposing previously unweathered polycyclic aromatic hydrocarbons (PAH)-laden creosote to the marine environment. Generally the piling is broken off at or slightly above the sediment mud line. Deployment of an oil recovery boom can assist in the corralling of floating pieces, but in locations where high wind and tidal current occur, the effectiveness of the boom is severely restricted. The most effective BMP for removal of creosote pilings is the use of a vibratory hammer to vibrate structurally sound pilings from the seafloor (EPA 2007). This operational method results in minimal, if any, creosote wood piling fragments discharged to Bay–Delta waters and largely eliminates the threat to special-status species and Bay–Delta marine resources. However, for those pilings that are not structurally sound enough to be removed by the vibratory hammer, other methods (as described above) would be employed. Because a significant percentage of the estimated 444 creosote pilings at the VMT Site are not structurally sound enough to be removed using a vibratory hammer, removal would result in a **significant impact (Impact 3.3-3)** from the release of toxic PAHs from creosote piling fragments of pilings removed with methods other than a vibratory hammer. Mitigation measures, designed to bring the impact of removing the creosote pilings to a level of less than significant, are provided in Section 3.3.5.

During proposed deconstruction and construction activities at the VMT Site (during both Phase 1 wharf and Phase 2 dike construction) construction debris could be introduced, including contaminant containing concrete, brick and asphalt materials, creosote wood, hydrocarbons, building materials and wrapping, and sediment runoff into the Napa River and the greater Bay–Delta ecosystem. This could have detrimental effects on fish, birds, and marine mammals, as well as pose impairments to foraging habitat used by special-status species. Many of these materials (e.g., creosote coated wood, asphalt, asbestos materials, plastic) contain potentially hazardous contaminants that could pose a threat to special-status marine species and to marine biota in general. Gasoline and diesel-powered construction and deconstruction equipment also possess the potential for the accidental release of toxic hydrocarbons to the Napa River and to Bay–Delta waters. The deliberate or accidental discharge of construction and deconstruction materials into project site waters could result in a **significant impact (Impact 3.3-4),** and mitigation measures designed to bring the impact of deconstruction and construction activities to a level of less than significant, are provided in Section 3.3.5.

Resuspension of Sediments from Dredging and Piling Removal

Resuspended sediments from dredging approximately 136,300 cubic yards of material (89,800 cubic yards for Phase 1 and 46,500 cubic yards for Phase 2) would be expected to be short-term, occurring only while dredging is conducted. Duration for dredging based on a 7,000-cubic-yards-per-day production rate is estimated at approximately 17–20 days. All in-water construction activities would be required to comply with USACE, EPA, RWQCB, and BCDC regulations and provisions in issued permits including best management practices for avoiding or reducing potential impacts related to resuspended sediments. In addition, wind waves and high tidal currents present at the VMT Site may quickly dissipate any turbidity plumes generated from dredging operations and thus minimize any effect on marine habitats and biota. Potentially increased turbidity from VMT construction activities is not expected to have a substantial effect on plankton productivity, since the shallow waters adjacent to the waterfront are naturally turbid with light penetrating less than a few feet from the surface. The use of clamshell dredging, with a clamshell bucket ≤ 10 cubic yards, for port slips and open water areas is consistent with routine maintenance and new channel/harbor dredging methodologies currently employed throughout the Bay annually and evaluated in the development of the LTMS for dredging in San Francisco Bay (LTMS 1998). Compliance with existing regulations and permit requirements would require strict adherence to BMPs for avoiding or reducing suspended sediments would ensure that the impact from contaminant exposure from resuspension of sediments would be **less than significant**.

Entrainment of Marine Taxa

Dredging of Bay–Delta sediments by either hydraulic suction or clamshell dredging equipment has the potential to entrain (directly remove) fish, benthic infauna, and mobile epibenthic (on the sediment surface) invertebrates, such as shrimp and crabs (Reine and Clarke 1998). Of these two dredging technologies, clamshell dredging, especially with a clamshell bucket ≤ 10 cubic yards capacity, has the lowest occurrence of fish and mobile invertebrate entrainment, since these animals are generally capable of sensing the pressure wave that precedes the clamshell bucket traveling through the water column, are expected to actively avoid the bucket, and generally avoid the active dredging site because of increased seafloor turbidity and noise (Reine and Clark 1998). A derrick barge with a clamshell bucket ≤ 10 cubic yards capacity would be used to dredge the approximate 136,300 cubic yards of material at the VMT Site. If contaminated sediments are found during the dredging process, the estimated 17–20 days needed to dredge this volume of material could be slightly extended, depending on the type and size of the dredge.

The LTMS for the Placement of Dredged Materials in San Francisco Bay Region (LTMS 1998) evaluated the potential entrainment of special-status and sensitive fish and invertebrate species by in-Bay dredging activities. To prevent and minimize entrainment of fish and invertebrates, the LTMS BMPs for Bay–Delta dredging include environmental work windows, restricted in-Bay disposal, limits on overflow dredging, and lowering hydraulic suction dredge heads when priming (LTMS 2013). VMT proposed dredging would be conducted with a clamshell dredge of ≤ 10 cubic yards capacity, and would employ either upland disposal or if acceptable would be used for beneficial reuse such as engineered fill on site. In addition, overflow dredging would be restricted and this work would be conducted within the environmental work windows shown in Table 3.3-4 in accordance with the LTMS. By adhering to the LTMS work windows and the employment of LTMS-established BMPs, salmon, steelhead, delta smelt, longfin smelt, and Sacramento splittail would not be present in the VMT Site during dredging, and the risk to these special-status species would be **less than significant**.

Table 3.3-4
Environmental Work Windows for Maintenance Dredging Activities Established in the Long-Term Management Strategy for San Francisco Bay

Species	Applicable Bay Region/Location	Authorized Work Windows
Steelhead Trout	Napa and Petaluma Rivers, Sonoma Creek	August 1 to October 15
Chinook Salmon, juveniles	San Francisco Bay Bridge to Sherman Island	June 1 to November 30
Chinook Salmon, adults	Pinole Shoal Suisun Bay Channel	June 1 to November 30
Chinook Salmon (Proposed 2014 Modification)	Napa River Channel/Mare Island Strait, Including Vallejo	No dredging December 1 to May 31
Sacramento Splittail	Carquinez Bridge to Collinsville	Consultation Required
Sacramento Splittail, juveniles	North San Pablo Bay, Napa and Petaluma Rivers	August 1 to January 31
Delta Smelt (water > 10 feet)	Carquinez Bridge to Collinsville	September 1 to November 30
Delta Smelt	Napa River	August 1 to January 31
Longfin Smelt	Carquinez Bridge to Collinsville	September 1 to November 30
Dungeness Crab	North Bay, San Pablo Bay, and shallow berthing areas	July 1 to April 30

Sources: LTMS 2004, 2014.

It should be noted that the LTMS environmental assessment and guidelines were initially established prior to green sturgeon being listed as an ESA-protected species on April 7, 2006, longfin smelt as a CESA-protected species on June 25, 2009, and the determination by the USFWS that longfin warrant listing, but that USFWS is precluded at this time from proposing to list the species because of the need to address other higher priority listing actions. Since these listings and determination, the LTMS has undergone a 12-year review and updated the environmental work windows and guidance to dredgers conducting maintenance dredging. Table 3.3-4 reflects these updates.

Although all of San Francisco Bay–Delta is listed as critical habitat for green sturgeon, their actual distribution and use of habitats throughout the Bay–Delta are relatively unknown. Green sturgeon is known to be present in the mouth of the Napa River (AECOM 2013; Ducks Unlimited 2014).

There is limited evidence of sturgeon entrainment during dredging (Hoover et al. 2005) and no known sturgeon entrainment incidents within San Francisco Bay–Delta by clamshell dredge. Since mechanical clamshell dredging equipment, which has been reported to be less a threat to fish entrainment than hydraulic dredging (Reine and Clark 1998), would be used for proposed VMT dredging activities, the potential risk to green sturgeon entrainment would be **less than significant.**

Construction Noise Impacts on Fish and Marine Mammals

As part of the Phase 1 wharf reconstruction, the VMT project component would include installation of eighty-one (81) precast 24-inch concrete pilings for construction of a reinforced concrete wharf and 8 additional 30-inch steel pipe-pilings to support mooring points on the wharf. Phase 2 dike construction would require the installation of twelve (12) 36-inch steel pipe piles. Concrete piles would be driven with an impact hammer using cushion blocks. Steel pipe piles would be driven to the maximum extent possible with a vibratory hammer. Concrete, and steel piles that are driven within the water column can produce high-intensity noise and result in damage to soft tissues, such as gas bladders or eyes (barotraumas), and/or harassment of fish and marine mammals such that they alter swimming, sleeping, or foraging behavior or abandon temporarily forage habitat. Protected and managed fish species, including salmon, steelhead, Sacramento splittail, delta and longfin smelts, Pacific herring, green sturgeon, and other bottom fish, as well as Pacific harbor seals and California sea lions, use the waters adjacent to the VMT for foraging and as a transit corridor between the open ocean (via the Golden Gate) and the Napa River, and would be potentially affected by the noise from pile driving.

The striking of a pile by a pile-driving hammer creates a pulse of sound that propagates through the pile, radiating out through the water column, seafloor, and air. Sound pressure pulses, as a function of time are referred to as a waveform. Peak waveform pressure underwater is typically expressed in decibels (dB) referenced to 1 microPascal (μPa). Sound levels are generally reported as peak levels (peak) and sound exposure levels (SEL). In addition to the pressure pulse of the waveform, the frequency of the sound, expressed in hertz (Hz) is also important to evaluating the potential for sound impacts. Low frequency sounds are typically capable of traveling over greater distances with less reduction in the pressure waveform than high frequency sounds. Pile driving hammers driving concrete and steel piles in water typically generate sound waves ranging between 185–220 dB_{peak} and 160–195 dB (SEL) (Caltrans 2009).

Table 3.3-6 provides a summary of estimated underwater noise levels from pile driving for the Phase 1 wharf and Phase 2 dike construction using both vibratory and impact hammers. For purposes of this assessment, it is assumed that the underwater sound levels generated by pile driving at the VMT Site would be similar to those reported by Caltrans (2009) for 24-inch octagonal concrete piles and both 30-inch and 36-inch steel pipe piles. Additionally, ambient underwater noise for a major harbor like San Francisco is estimated at approximately 150 dB (Caltrans 2009), although the ambient noise at the VMT Site can be assumed to be slightly lower, since little large vessel traffic occurs at that location, the Vallejo Ferry being the most frequent.

Caltrans (2009) reported sound levels of 175–192 dB at distances of approximately 10 and 30 feet (3 to10 meters), respectively being generated (depending on water depth) when using an impact hammer to drive 24-inch octagonal concrete pilings. Caltrans further reported underwater sound levels of 208 dB at a distance of 30 feet (10 meters) being generated when using an impact hammer to drive 36-inch steel pilings. These sound levels can be reduced using attenuation devices such as bubble curtains and cushion blocks, as shown in Table 3.3-5. As an example, underwater sounds levels can be reduced for 24-inch octagonal concrete piles from 192 dB to 188 dB using cushion blocks and are shown to further lower them down to 175 dB when utilizing bubble curtains (Caltrans 2009). Pile driving for the VMT project component would use wood cushion blocks.

Using in-water noise level data for impact hammer driven 24-inch concrete and 30- and 36-inch steel piles and applying estimated installation requirements for the VMT wharf (approximately 580 hammer strikes as estimated in Caltrans for 24-inch concrete piles), the distances required to reach established regulatory thresholds of 187 and 183 dB, discussed above, can be estimated (Caltrans 2009). Results for these estimates are shown in Table 3.3-6. The results indicate that using an impact hammer to drive a 24-inch concrete piling would be expected to generate a peak sound level of 175-192 dB and 166 SEL, at a distance of 30 feet (10 meters). Using an impact hammer to drive a 36-inch steel piling would be expected to generate a peak sound level of 208 dB and 180 SEL, at a distance of 30 feet (10 meters).

Furthermore, the sounds generated from driving 24-inch concrete pilings would be expected to attenuate to 187 dB at distances of 0-28 meters (0 to 0.02 mile) and to 183 dB at distances of 0–51 meters (0 to 0.03 mile). Sounds generated from driving 36-inch steel pilings would be expected to attenuate to 187 dB at distances of 4-237 meters (0 to 0.15 mile) and to 183 dB at distances of 8–439 meters (0.01 to 0.27 mile). The distance of the channel directly adjacent to the VMT Site is approximately 335 meters, so it can be assumed that any sound produced from pile driving of 24-inch concrete pilings using an impact hammer would reach approximately one-sixth of the way across the channel. Sound produced from use of an impact hammer to drive 30- to 36-inch steel pilings is estimated to reach across the channel and presumably bounce back across the channel.

In addition, installation of 24-inch steel sheet piles is proposed during the Phase 1 construction. VMT would employ a vibratory hammer to install these estimated steel sheet piles generating underwater noise levels of 177 dB at 30 feet and attenuating to 183 dB at a distance of approximately 30 feet.

This would indicate that all special-status fish species, especially smelt and Sacramento splittail, and any mammals that happen to be present in the channel would be affected by noise produced by all pile driving requiring the use of both impact and vibratory hammers.

Table 3.3-5
Estimated Near-Source Underwater Noise Levels From Pile Driving

Pile Size/Type	Relative Water Depth	Distance from Piling Measurement Taken	Average Sound Pressure			Attenuation Device
			Peak (dB)	*Route Mean Square (RMS)*	*SEL (dB)*	
			Vibratory Driver			
24-inch AZ steel sheet	~50 feet (15 meters)	~30 feet (10 meters)	177	163	162	None
			Impact [3]			
24-inch AZ steel sheet	~50 feet (15 meters)	~30 feet (10 meters)	205	189	179	None
24-inch octagonal concrete	~10 feet (3 meters)	~30 feet (10 meters)	192	172	—	None
24-inch octagonal concrete	~30–50 feet (10-15 meters)	~30 feet (10 meters)	188	176	166	Cushion block
24-inch octagonal concrete	~10 feet (3 meters)	~30 feet (10 meters)	175	162	—	Short confined bubble curtain
30-inch steel pipe pile	<15 feet (<5 meters)	~30 feet (10 meters)	205	190	—	None
30-inch steel pipe pile	<15 feet (<5 meters)	~30 feet (10 meters)	196	180	—	Bubble Curtain
36-inch steel pipe pile	<15 feet (<5 meters)	~30 feet (10 meters)	208	190	180	None

Source: Caltrans 2009

Notes:

[1] Signal analyses of pile installation sounds were not performed; therefore, corresponding SEL data are not available.

[2] The sound from pile driving was only partially attenuated due to problems setting the isolation casing/air bubble curtain.

[3] Note that use of an impact hammer is conservatively used in this analysis for driving the 30 and 36-inch steel piles listed in this table; as noted above, the applicant's preferred method of installation for these larger piles is use of a vibratory hammer, which would have reduced average sound pressure results.

Noise Impacts to Fish

Scientific investigations on the potential effect of noise on fish indicate that sound levels below 183–187 dB do not appear to result in any acute physical damage or mortality to fish a (barotraumas) depending on their size (Dalen and Knutsen 1986; Caltrans 2009). Table 3.3-7 provides a summary of some known acute and sub-lethal effects of noise on fish and marine mammals. Table 3.3-8 additionally provides NOAA-proposed alterative acute and sub-lethal effects of noise for different groupings of marine mammals. Noise levels that result in startle responses in steelhead trout and salmon have been documented to occur at sound levels as low as 140 dB at a frequency of 100 Hz and between 180 and 186 dB in Pacific herring (San Luis and Delta Mendota Water Authority and Hanson 1996). Any disturbance to ESA-listed fish species that results in altered swimming, foraging, movement along a migration corridor, or any other altered normal behavior is considered harassment.

Based on estimated underwater noise attenuation values (see Table 3.3-6), the use of impact hammers with a cushion block to install the 36-inch steel piles is expected to generate 187 dB or lower sound levels for a short period of time within a zone extending out approximately 4 to 44 meters (0 to 0.03 mile) from the VMT Site (Caltrans 2009), or approximately one-tenth the width of the Napa River at the VMT Site.[3] As noted above, the applicant's preferred method for use of a vibratory hammer to drive the 30- and 36-inch steel piles would produce lower sound level impacts.

Pile driving of 24-inch concrete piles using an impact hammer is estimated to attenuate to 187 dB at distances of 0 to 28 meters (0 to 0.02 mile) and to 183 dB at distances of 0 to 51 meters (0 to 0.03 mile), respectively, or approximately one-tenth of the distance across the Napa River at the VMT Site.

During pile driving activities, fish are not expected to be present within a zone of several meters (6 to 8 feet), since the movement of the piling through the shallow water and initial contact with the Bay–Delta seafloor would result in any fish that are present quickly leaving the immediate area. Any salmon, steelhead, green sturgeon, Pacific herring, or MSA-managed fish species swimming near pile driving activities are therefore not expected to experience any acute effects or barotraumas from vibratory pile driving. However, longfin smelt, delta smelt and Sacramento splittail frequent shallow water, so there is a greater probability that they would be present in the project area during pile driving. Although the potential for acute barotrauma to occur is limited, behavioral changes in fish movement or activity can be expected to occur. Due to this potential impact from pile driving noise, the use of vibratory pile drivers and other BMPs can be expected to reduce underwater pile driving noise to substantially reduced noise levels.

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[3] The width of the Napa River at the VMT Site is estimated at 335 meters (1,099 feet or 0.21 mile).

Table 3.3-6

Estimated Vibratory and Impact Hammer Pile Driving Sound Levels and Disturbance to Criteria Levels

Pile Type	Estimated Number of Strikes	Equipment Type	Distance to Sound Level Threshold* (meters)				Attenuation Equipment
			206 dB	*187 dB (Fish ≥ 2g)*	*183 dB (Fish< 2g)*	*150 dB (Behavioral)*	
24-inch AZ Steel Sheet	100-200	Vibratory	0	5-7	9-14	74	None
24-inch AZ Steel Sheet	100-200	Impact	9	63-100	117-185	3981	None
24-inch Octagonal Concrete	580	Impact	1	0	0	293	None
24-inch Octagonal Concrete	580	Impact	1	28	51	541	Cushion block
24-inch Octagonal Concrete	580	Impact	0	0	0	63	Short confined bubble curtain
30-inch steel pipe pile	580	Impact	9	0	0	63	None
30-inch steel pipe pile	580	Impact	2	0	0	1000	Bubble Curtain
36-inch Steel Pipe Pile	580	Impact	14	237	439	4642	None
36-inch Steel Pipe Pile**	580	Impact	0-3	4-44	8-81	86-858	Cushion block

Notes:

* Calculated according to protocols outlined in Caltrans 2009. Number of strikes also taken from Caltrans 2009.

** Estimated range based on subtracting 11 and 26 dB, documented reductions in sound pressure levels with wood cushion block (Caltrans 2009).

1 Signal analyses of pile installation sounds were not performed; therefore, corresponding SEL data are not available.

2 Estimated number of strikes based on minimum number of strikes to drive 24-inch concrete piling (Caltrans 2009). Driving of 30- and 36-inch steel piles with a vibratory hammer as preferred by the applicant would produce lower sound impacts without emissions associated with “strikes.”

Table 3.3-7
Potential Effects of Varying Noise Levels to Fish and Marine Mammals

Taxa	Sound Level (dB)	Effect	Reference
Fish			
All fish >2 grams in size	206 (peak) 187 (SEL)	Acute Barotraumas	Fisheries Hydroacoustic Working Group 2008
All fish <2 grams	186 (SEL)	Acute Barotraumas	Fisheries Hydroacoustic Working Group 2008
Pacific Herring	180–186	Avoidance behavior	Dales and Knudsen 1986
Salmon, Steelhead	166	Avoidance behavior	Loeffelman et al. 1991
Salmon, Steelhead	140–160	Startle response	San Luis and Delta Mendota Water Authority and C.H. Hanson. 1996
Marine Mammals			
Marine Mammals	180–190	Level A[1] harassment out to 65 feet from sound source	NOAA Fisheries 2011
Harbor seals	180 at 12 kHz	Discomfort zone out to 4 miles	Kastelein et al. 2006
Harbor seals	166–195	Can be detected at distances up to 2.9 miles	Terhung et al. 2002
Marine Mammals	160 from impact hammer	Level B[2] harassment out 328 feet from sound source	NOAA Fisheries 2011
Marine Mammals	120 from vibratory hammer	Level B[2] harassment out to 1.2 miles	NOAA Fisheries 2011
Harbor seals	>155	Avoidance behavior	Terhung et al. 2002
Harbor seals	107 at 12 kHz	Discomfort zone out 20-meters from the sound source	Kastelein et al. 2006
Harbor seals	>75	Threshold level of detection	Kastak and Schusterman 1998

Notes: kHz = kilohertz

[1] Level A harassment is defined as any act of pursuit, torment, or annoyance with has the potential to injure a marine mammal or marine mammal stock in the wild.

[2] Level B harassment is defined as any act of pursuit, torment, or annoyance with has the potential to disturb a marine mammals or marine mammal stock in the wild.

Table 3.3-8

Summary of Alternative Permanent Threshold Shift (PTS) and Temporary Threshold Shift (TTS) Sound Levels from Dual Acoustic Threshold Noise Levels for Marine Mammals

Numeric[1, 2] Level				
	PTS Onset (Received Level)		*TTS Onset (Received Level)*	
Hearing Group	*Impulsive*	*Non-impulsive*	*Impulsive*	*Non-impulsive*
Low-Frequency (LF) Cetaceans (Baleen whales)	All 230 dB_{peak} and 187 dB SEL_{cum}	NB > 10 kHz 230 dB_{peak} and 215 dB SEL_{cum}	All 224 dB_{peak} and 172 dB SEL_{cum}	NB > 10 kHz 224 dB_{peak} and 195 dB SEL_{cum}
		All others 230 dB_{peak} and 198 dB SEL_{cum}		All others 224 dB_{peak} and 178 dB SEL_{cum}
Mid-Frequency (MF) Cetaceans (Dolphins, toothed whales, beaked whales, bottlenose dolphins)	All 230 dB_{peak} and 204 dB SEL_{cum}	NB > 3 kHz 230 dB_{peak} and 198 dB SEL_{cum}	All 224 dB_{peak} and 189 dB SEL_{cum}	NB > 3 kHz 224 dB_{peak} and 178 dB SEL_{cum}
		All others 230 dB_{peak} and 215 dB SEL_{cum}		All others 224 dB_{peak} and 195 dB SEL_{cum}
High-Frequency (HF) Cetaceans (True porpoises, river dolphins	All 201 dB_{peak} and 180 dB SEL_{cum}	NB > 3 kHz 201 dB_{peak} and 180 dB SEL_{cum}	All 195 dB_{peak} and 165 dB SEL_{cum}	NB > 3 kHz 195 dB_{peak} and 160 dB SEL_{cum}
		All others 201 dB_{peak} and 199 dB SEL_{cum}		All others 195 dB_{peak} and 179 dB SEL_{cum}
Phocid Pinnipeds (True seals) (Underwater)	All 235 dB_{peak} and 192 dB SEL_{cum}	All 235 dB_{peak} and 1 97 dB SEL_{cum}	All 229 dB_{peak} and 177 dB SEL_{cum}	All 229 dB_{peak} and 183 dB SEL_{cum}
Otariid Pinnipeds (Sea lions and fur seals) (Underwater)	All 235 dB_{peak} and 215 dB SEL_{cum}	All 235 dB_{peak} and 220dB SEL_{cum}	All 229 dB_{peak} and 200 dB SEL_{cum}	All 229 dB_{peak} and 206 dB SEL_{cum}

Source: NOAA Fisheries 2013

Notes:

NB = narrow band SEL = sound exposure level

[1] Dual acoustic threshold levels: Use whichever (SEL_{cum} or dB SEL_{cum}) exceeded first. These alternative acoustic threshold levels are based on whether the sound pressure levels from the source are predominantly within the "M-weighting" component of the curve, or the equal loudness contours (EQL) of the auditory weighting curve (i.e., below or above 3 kHz for MF and HF cetaceans and 10 kHz for LF cetaceans, respectively). Since pinniped auditory weighting functions are derived solely from the M-weighting function, the same exposure levels are used for all sound sources. They also are based on an assumption that the most common of impulsive sources (i.e., airguns, impact pile drivers, explosives) have the majority of their sound pressure level at low frequencies (i.e., within the M-weighted component of the curve for HF and MF cetaceans: below 3 kHz). If there were an impulsive source with the majority of its energy above 3 kHz, the proposed alternative criteria would need to be modified on a case-by-case basis. Note that acoustic threshold levels for impulsive or non-impulsive sources are based on characteristics at the source and not the receiver.

[2] Other qualitative factors for considerations presented in Table 6b should still be considered in conjunction with these acoustic threshold levels

As indicated above, use of an impact hammer to drive 24-inch concrete and 30- and 36-inch steel pilings can be expected to reach sound levels that exceed 187 dB distances equal to or slightly greater than one-tenth the width of the Napa River at the project site. These sound levels pose potential significant risk to small fish such as longfin and delta smelts and Sacramento splittail, as well as cause salmon, steelhead, and green sturgeon and could modify their foraging and/or normal swimming behaviors (Table 3.3-5). Although the LTMS windows (Table 3.3-4) were designed for dredging, they are also applicable for pile driving. Restricting the installation of all pile driving to the LTMS work windows, when potentially threatened special-status fish species are not expected to be present in the project area, would minimize if not eliminate the potential impact to these species. If the work is unable to adhere to the designated LTMS work windows, the project must develop and follow a noise management plan acceptable to USFWS, CDFW, and other state and federal agencies with regulatory jurisdiction to prevent noise impacts on special-status fish species. As proposed by the applicant, vibratory hammers should be implemented on all installations whenever and wherever possible, as a BMP. The use of other BMPs such as bubble curtains and cushion blocks can be expected to reduce transmitted sounds levels and the distance over which potentially deleterious sounds levels would travel during pile drive installations. Effective application of these BMPs (potentially as permit conditions) is also critical to reducing pile driving noise generation.

Corroborating this determination, the NOAA Fisheries 2007 programmatic consultation for essential fish habitat pursuant to the MSA-listed (NOAA Fisheries 2007) and ESA-listed (74 FR 52300–52351) species, and marine mammals covered by the MMPA, established activity-specific criteria to avoid or minimize adverse effects to individuals and cumulative instances of specific routine permitted activities. These activities include bridge repair, bank stabilization, culvert replacement, navigational dredging, boat dock construction and maintenance, piling installation, pipeline repairs, and levee maintenance. As part of a project’s consultation with NOAA Fisheries, pursuant to the ESA, MMPA, and MSA, if the proposed activity included one of the above routine permitted activities and conformed to normal and routine type operations, the activity would be allowed pursuant to specific requirements. Specific to piling installation, this programmatic consultation established that for any size of steel, wood, or concrete piling installation employing a vibratory hammer, that installation could occur year-round with no meaningful impact to fish.

Based on the potential for underwater noise generated from impact hammer pile driving of 24-inch concrete and 30- and 36-inch steel pipe pilings for the construction of the Phase 1 wharf and Phase 2 dike, the potential impact to special-status fish species, including salmon, steelhead, sturgeon, and especially longfin and delta smelt and Sacramento splittail, would be **significant (Impact 3.3-5)**, and mitigation is provided in Section 3.3.5.

Noise Impacts to Marine Mammals

Noise studies on pinnipeds (seals and sea lions) indicate that harbor seals can detect sounds in water as low as 65 dB at frequencies of 75 Hz and higher, and that avoidance behaviors are regularly exhibited at sound levels of 80 dB above hearing thresholds, or approximately 160 to 165 dB (Kastak and Schusterman 1998) (see Table 3.3-7 and Table 3.3-8). Of particular significance are the investigations of Kastelein (Kastelein et al. 2006), which found that 12-kilohertz (kHz) sounds produced a discomfort threshold for harbor seals at 107 dB and that 180 dB sounds at the same frequency maintained a discomfort zone extending out 4 miles. Sounds at 12 kHz are extremely low frequency sounds and as such can travel long distances with little decrease in sound intensity. Programmatic consultation (NOAA Fisheries 2007) between USACE and NOAA Fisheries for routine harbor and port maintenance activities established that when marine mammals are potentially present, a species-specific work window would apply to the project; the project may be required to have on-site monitors; and incidental harassment permits might be needed. The consultation further stated that the project would be required to:

- Maintain route mean square (RMS) underwater sound pressures below levels that can injure (180 dB re 1 micropascal) or affect the behavior (160 dB re 1 micropascal) of marine mammals.
- Maintain a 1,600-foot (500-meter) safety zone around sound sources in the event the sound level is unknown or cannot be adequately predicted through modeling or calculations.
- Maintain sound levels below 90 dBA (A-weighted decibels) in air when pinnipeds (seals and sea lions) are present, by real-time noise monitoring.
- Halt work activities when a marine mammal enters the 1,600-foot (500-meter) safety zone.
- Bring loud mechanical equipment on-line slowly.
- Reduce vessel operations speed when marine mammals are in the project area.

Bay–Delta waters adjacent to the proposed pile driving activities at the VMT Site are infrequently used by harbor seals and California sea lions. They are mostly present during salmon and steelhead migration periods. Thus, there would be a potential for noise disturbance from proposed pile driving activities to affect these marine mammals if conducted when the probability of sea lions and harbor seals being present is highest. It can be assumed that if pile driving occurs during the LTMS work windows for salmon and steelhead, that the likelihood of causing impact to marine mammals would be minimal. Depending on when pile driving activities would be conducted for the VMT project component, the potential effects of underwater noise from pile driving on marine mammals could be **significant** (**Impact 3.3-6**), and mitigation is provided in Section 3.3.5.

Operational Impacts

Ongoing routine operation of the VMT project component would include activities that have the potential to directly and indirectly affect protected and special-status marine species listed earlier. These include the following.

- Installed wharf lighting can cause temporary increased nighttime illumination of Bay–Delta waters, which may alter normal fish behavior and increase bird, fish, and marine mammal predation on some fish species, including longfin and delta smelts and Sacramento splittail. Artificial lighting can attract marine mammals, including California sea lions and harbor seals, and some special-status marine birds, as discussed in Section 3.3.2, under the heading Terrestrial Biology.
- Stormwater runoff from the Phase 1 wharf and Phase 2 dike can potentially introduce increased nutrients, sediments, and organic and inorganic contaminants to Bay–Delta waters.
- The placement of a large wharf and dike over Bay–Delta waters would result in the shading of Bay–Delta waters, potentially resulting in the reduction of plankton productivity which support special-status species such as delta and longfin smelts and Sacramento splittail, as well as inhibit or prevent the establishment or growth of submerged aquatic vegetation beds such as eelgrass or widgeon grass.
- Ongoing maintenance dredging can be expected to result in the temporary loss of foraging habitat for some fish and marine mammal species, cause short-term and localized increased water turbidity and exposure to sediment-affiliated organic and inorganic contaminants from resuspended sediments, and fish entrainment
- Wharf maintenance can be expected to result in the periodic removal and installation of 24-inch concrete piles that can result in the temporary loss of subtidal hard substrate habitat and associated marine community that is used for fish forage.
- Wharf piling installation and maintenance dredging can be expected to result in the temporary resuspension of potentially contaminated sediments during dredging, as well as in temporary shading from dredge overflow plumes, which could directly and indirectly affect special-status fish species.
- Replacement of 24-inch concrete pilings during wharf maintenance can result in increased noise levels that can be fatal and/or harmful to special-status fish and marine mammals.

VMT anticipates receiving approximately up to four vessels a month to load and offload bulk and break-bulk cargo from the Phase 1 Terminal. The additional vessel traffic through the San Francisco Bay–Delta and the Napa River is not expected to result in any substantive increase in vessel traffic through San Francisco Bay as discussed in Section 3.12, Transportation and Traffic. As such, no potential threat to special-status species is expected from vessels using the VMT facilities.

The following discussions address the potential effect of the previously listed project-related ecological changes on project area marine habitats and their potential impact on identified sensitive species.

Increased Nighttime Artificial Illumination of Water

Increased artificial illumination of Bay–Delta waters at night can alter normal swimming and foraging behavior of fish, marine mammals, and seabirds. Many pelagic schooling fish, such as sardines and herring, as well as delta smelt and longfin smelt are attracted to illumination cast by boats and offshore structures and are therein subject to increased predation from other fish species, marine birds, and marine mammals (TRAC 2001). Measures that are often used to minimize the effects of artificial night lighting on marine biota include installation of wharf, pier, and dock lighting that is low to the dock or pier surface; use of low-voltage, sodium, LED, or non-yellow-red spectrum lights; and use of shielding to restrict the transmittance of artificial light over the water. Critical to reducing artificial lighting impacts to aquatic species is to restrict artificial lighting to the areas of the wharf that require artificial illumination and to limit overwater lighting. The potential for impacts on sensitive species from artificial night lighting on new wharf and dike as well as from improved shoreside facilities and buildings would result in a **significant impact** (**Impact 3.3-7**), and mitigation is provided in Section 3.3.5.

Stormwater Runoff to Bay–Delta Waters

Stormwater runoff from the VMT Phase 1 wharf and Phase 2 dike has the potential to result in the introduction of increased nutrients, sediments, and organic and inorganic contaminants to the Napa River and Bay–Delta ecosystems. As discussed in Section 3.8, Hydrology and Water Quality, the planned stormwater control plans for both the VMT and Orcem Sites have all stormwater directed away from the Napa River and contained in a retention pond. As a result, no potential threat to special-status species is anticipated from stormwater runoff from the collective projects and is determined to be **less than significant**.

Shading of Bay–Delta Waters

The installation of the Phase 1 wharf would result in overwater shading of approximately 14,500 square feet (0.33 acre) of subtidal and intertidal habitat. This is in comparison to the remnants of the deteriorated wharf, which currently provides approximately 0.17 acre of shading.

Overwater structures can alter the physical ecological conditions present under them, including increasing the deposition of sediments and thereby reducing water depth and the grain size composition of seafloor sediments and therein the composition of benthic infaunal communities, and reducing the penetration of ambient light into Bay waters (TRAC 2001). Decreased light penetration into Bay waters can have an effect on phytoplankton production and the presence and growth of marine algae, including eelgrass. Shade cast from docks, piers, and pilings has been shown to reduce the amount of ambient light within the marine environment, affect invertebrate and vertebrate community composition, and create behavioral barriers that can deflect or delay fish migration, reduce fish prey forage, and alter predator-prey relationships over normal open-water conditions (TRAC 2001).

During intertidal and benthic surveys of the VMT Site (Appendix E-4 and Appendix E-6), very little subtidal marine algae was observed, and no eelgrass or other submerged aquatic vegetation was present. The Napa River flows past the VMT Site and because of its location at the mouth of the river as it flows into San Pablo Bay, the site experiences twice daily high wave and tidal currents that maintain seafloor sediments and sediments in suspension. This results in naturally turbid water that limits ambient light penetration and phytoplankton production. Based on existing conditions at the proposed VMT Site, the potential effect of shading on sensitive species is expected to be **less than significant**. Additionally, the increased shading of the lower intertidal hard substrate habitat adjacent to the wharf and dike is expected to result in increased native Olympia oyster habitat.

Wharf Maintenance Activities Including Maintenance Dredging and Wharf Piling Maintenance

As discussed earlier under VMT Construction Impacts, channel dredging and piling installation would result in the temporary loss of both soft and hard substrate habitat used to support marine taxa used as fish forage for some special-status fish species and MSA-managed fish species. Additionally, these routine maintenance activities can result in the temporary resuspension of contaminated sediments, cause temporary shading from sediment plumes, and produce underwater noise that can be directly or indirectly harmful to special-status fish species and MSA-managed fish species.

Although the frequency of needed wharf maintenance or pile replacement is unknown, for the purposes of this assessment it is assumed that they would occur periodically throughout the life of the facilities and would be of short duration when they do occur. Maintenance dredging, which would be authorized through permits issued by state and federal regulatory agencies, may be required, on average, for a period of 5 days every 4 years. As discussed earlier under VMT Construction Impacts, the potential effects and affected special-status species would be similar in nature to those discussed for initial site dredging, piling removal, and replacement, as well as expected recovery of marine biota following the activity. As with the initial dredging and piling replacement, the application of BMPs, including adherence to LTMS acceptable work windows, would reduce the potential impact to special-status species; however, the impact would be **significant** without mitigation (**Impact 3.3-8)**. Mitigation is provided in Section 3.3.5.

Orcem Analysis

Construction Impacts

As discussed earlier, deconstruction/demolition of existing buildings and infrastructure at the Orcem Site and construction of new buildings and infrastructure has the potential to introduce demolition and construction debris, trash, and waste materials, as well as sediment and stormwater bearing hydrocarbons and other contaminants into the Napa River. These actions would pose a threat to special-status marine species and to marine biota in general. Additionally, the staging or stockpiling of potentially toxic deconstruction debris and materials such as concrete, asphalt, contaminated sediments or other contaminant-containing materials, such as asbestos, that are awaiting disposal or reuse, as well as stockpiling new construction materials and equipment near or adjacent to the waterfront could result in the accidental release of these materials into the Napa River and the Bay–Delta ecosystem, therein posing a significant threat and a **significant impact** to special-status species and the Bay–Delta ecosystem in general (**Impact 3.3-9**. Mitigation is provided in Section 3.3.5.

Operational Impacts

Stormwater runoff from the Orcem operations and onshore facilities has the potential to result in the introduction of organic and inorganic contaminants to the Napa River and to Bay–Delta ecosystems. As discussed in Section 3.8, Hydrology and Water Quality, the planned stormwater control plans for both the VMT and Orcem Sites have all stormwater directed away from the Napa River and contained in a retention pond. As a result, no potential threat to special-status species is anticipated from stormwater runoff from the collective projects, and impacts would be **less than significant**.

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

Terrestrial Biological Resources

VMT and Orcem Project Analysis

Approximately 0.01 acre of Northern Coastal Salt Marsh and 0.02 acre of Seasonal Wetland occur on the project site; however, these areas would not be impacted by the proposed project.

Therefore, **no impact** to terrestrial riparian habitat or other sensitive natural community would occur as a result of the proposed project.

Marine Biological Resources

VMT and Orcem Project Analysis

No known eelgrass or extensive submerged aquatic vegetation beds occur at the VMT or Orcem Sites (Appendix E-4). Potential removal of some existing subtidal rock shoreline armoring/riprap and pier pilings may remove some artificial habitat used to support submerged aquatic vegetation, but their replacement by new pilings and hard substrate subtidal armoring/riprap, which would be recolonized, would result in a **less than significant** impact.

Although some native Olympia oysters were observed by AMS (Appendix E-4) inhabiting the lower intertidal area under the existing VMT wharf, it is assumed that they are also present in the shallow subtidal region of the VMT Site attached to existing rock armoring/riprap and wood pilings. Removal and replacement of both the rock armoring/riprap and pilings as part of the Phase 1 wharf and Phase 2 dike construction, as discussed earlier under VMT Construction Impacts, would result in the temporary loss of both the existing artificial hard substrate habitat and any attached native Olympia oysters. This loss of artificial hard substrate habitat inhabited by native Olympia oysters would be temporary once the construction of the Phase 1 wharf and Phase 2 dike are completed. As further discussed under VMT Construction Impacts, the substantial increase in linear footage of low intertidal and shallow subtidal artificial hard substrate habitat, as well as the 91% increase in low intertidal acreage covered by wharf decking, is expected to also increase the amount of suitable habitat for native Olympia oysters and therefore result in a **less-than-significant** impact.

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

VMT and Orcem Project Analysis

A wetland delineation was conducted by WRA in 2007 (Appendix E-1). The project site contains approximately 0.01 acre of Northern Coastal Salt Marsh and 0.02 acre of Seasonal Wetland, as well as tidal waters and a shoreline band. Northern Coastal Salt Marsh is considered a sensitive plant community by CDFW. Neither the Northern Coastal Salt Marsh nor the Seasonal Wetland would be impacted by the proposed development on the site. As discussed earlier under Impact B, there are no known eelgrass or extensive submerged aquatic vegetation beds at the VMT or

Orcem Sites (Appendix E-4). For these reasons, **no impact** to federally protected wetlands would occur as a result of the proposed project.

D) Would the project 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?

Terrestrial Biological Resources

VMT and Orcem Project Analysis

The project site is not part of a regional wildlife corridor and is not directly connected to any larger area of contiguous habitat, as the site is surrounded by urban development.

The project site does not function as part of a terrestrial wildlife corridor that links large open space areas. Impacts to wildlife movement corridors would be **less than significant.**

Marine Biological Resources

VMT and Orcem Project Analysis

As discussed earlier (under VMT Construction Impacts) for criteria A, the waters of the Napa River adjacent to the project site are used as a migratory corridor by Chinook salmon (Central Valley fall and late fall-run), steelhead trout (Central California Coast), longfin smelt, delta smelt, and Sacramento splittail, as they swim to locations farther upriver to spawn. Depending on the species, the LTMS work windows identify acceptable periods of time when the special-status species are not expected to be present in the area. Additionally, delta smelt and Sacramento splittail are only known to be present in the lower Napa River during periods of high freshwater flow during wetter winters (LSA 2009).

Although dredging poses some risk to salmon, steelhead, longfin and delta smelts, and Sacramento splittail from entrainment, exposure to resuspended sediments and potential contaminants, the use of a bucket dredge (≤ 10 cubic yards capacity), adherence to the LTMS work windows, and the application to established BMPs required by the USACE, RWQCB, and BCDC when issuing permits for dredging, the potential effect of dredging on migratory fish species as they transit past the project site is expected to be **less than significant**.

Similarly, use of an impact hammer for pile driving of new 24-inch concrete and 30- and 36-inch steel piles can be expected to result in underwater noise levels that can result in permanent auditory damage to migrating fish, especially delta and longfin smelts, Sacramento splittail, and juvenile steelhead and salmon, as discussed earlier (under VMT Construction Impacts) for criteria A. This impact would be **significant** (**Impact 3.3-10**), and mitigation is provided in Section 3.3.5.

E) Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Terrestrial Biological Resources

VMT and Orcem Project Analysis

A tree survey prepared for the project by WRA in 2007 identified 523 trees 6 inches or larger dbh (see Appendix E-2). The majority of trees species on the site are blue gum and white ironbark eucalyptus (265 trees), followed by blackwood acacia (61 trees) and Monterey pine (55). These tree species make up 73% of trees on the site. The proposed project has been designed to avoid impacts to treed areas on site and would impact two southern magnolia (*Magnolia grandiflora*) trees. These trees are not regulated by the City's tree ordinance, and removing these trees would result in **no impact** related to conflicts with the City's tree ordinance.

Marine Biological Resources

VMT and Orcem Project Analysis

The San Francisco Bay Subtidal Habitat Goals Report, as discussed in Section 3.3.1 (Local Regulations), provides a scientific foundation and approach for the conservation and enhancement of submerged areas of San Francisco Bay and was prepared in collaboration with BCDC, California Ocean Protection Council/California State Coastal Conservancy, NOAA, and the San Francisco Estuary Partnership (SFBSHGP 2010). As such, it contains many recommended conservation goals for Bay subtidal habitats potentially affected by VMT activities, most notably the reconstruction/construction and maintenance of the Phase 1 wharf and Phase 2 dike. These goals can be used by these agencies when evaluating proposed projects within their jurisdiction. The Subtidal Habitat Goals Report includes habitat conservation goals that promote no net loss or disturbance to soft bottom and rock habitats (subtidal and intertidal zones), enhancing habitat function of artificial structures, minimizing placement of artificial structures detrimental to subtidal habitat function, protecting native shellfish habitat and existing eelgrass habitat, and protecting macroalgal bed (*Fucus* and *Gracilaria* spp.). Although the San Francisco Bay Subtidal Habitat Goals Project has no regulatory authority, any detrimental changes to Bay–Delta subtidal habitats would also have potential negative effects to special-status species, critical habitat, managed fish species EFH, or important forage for marine mammals.

As discussed in the impact assessments (under VMT Construction Impacts) for criteria A, some disturbance and both temporary or permanent loss of Bay–Delta intertidal and subtidal soft substrate habitat is expected to occur during dredging (temporary), Phase 1 wharf and Phase 2 dike construction (permanent), and piling removal and installation (temporary and permanent). Additionally, as part of the Phase 1 wharf and Phase 2 dike construction, a small area of sandy beach intertidal would be permanently lost, and intertidal and shallow subtidal artificial hard substrate habitat would be temporarily lost. At the completion of the Phase 1 wharf and Phase 2 dike, an additional 800 linear feet of lower intertidal and shallow subtidal artificial hard substrate habitat would be created, and an estimated additional 1,200 linear feet of lower intertidal and 800 feet of shallow subtidal habitat, suitable for native Olympia oyster habitat, would be established.

Although there would be a loss of approximately 500 linear feet of sandy beach intertidal habitat as a result of the construction of the Phase 2 dike, approximately 1,450 linear feet of similar habitat would remain undisturbed and undeveloped. As noted in Section 3.3.2 under Marine Biology, *Fucus distichus* was observed inhabiting the lower intertidal area of the approximately 2,000 linear feet of sandy beach intertidal habitat at the VMT Site (Appendix E-4). AMS observed only individual plants in low numbers and predominantly along the southern stretch of beach closer to San Pablo Bay and more saline water, which would be left undisturbed. Additionally, a small area of tidal mudflat located in the northwest corner of the VMT Site would be buried under the new Phase 2 dike; the mudflat is not currently providing suitable habitat for eelgrass or other tidal or submerged aquatic vegetation (Appendix E-4) and provides limited foraging habitat for fish.

None of the proposed VMT wharf or dike improvements would result in the removal or loss of any habitat function or historical value of artificial structures, or result in the net loss of any eelgrass or macroalgal beds, or result in a net loss of oyster beds or habitat. The removal of the approximate 444 creosote wood pilings, although currently providing limited intertidal and subtidal hard substrate habitat, do not appear to support a very rich or abundant marine community (Appendix E-4) and pose a greater toxic risk to the marine environment because of the creosote coating the pilings. Additionally, these pilings would be replaced by eighty-one (81) 24-inch concrete, eight (8) 30-inch steel, and twelve (12) 36-inch steel pilings at the completion of the Phase 2 dike, resulting in an increase in artificial hard substrate in the intertidal and subtidal zones, than currently present. Finally, as mentioned earlier, the establishment of the new Phase 1 wharf at the VMT Site is expected to increase available native Olympia oyster habitat. Consequently, potential effects of the VMT project component on marine biota considered in local policies or ordinances intended to protect biological resources is determined to be **less than significant.**

Non-native Species

One of the greatest threats to San Francisco Bay–Delta marine subtidal and intertidal habitats is from the introduction of non-native species. The introduction of non-native species into the Bay–Delta ecosystems can result in large-scale changes to the aquatic communities. It is estimated that a new species is introduced into San Francisco Bay every 14 weeks based on the number of known introduced species into the Bay since tracking began (Roman 2011). Many fail to survive their introduction or do not spread. Some do survive, however, and produce major ecological changes in resident biological communities, such as has occurred with the introduction of the Asian clams, *Potamocorbula amurensis* and *Corbicula fluminea*, which has resulted in significant changes in native benthic infaunal communities in the western Delta and Sacramento and San Joaquin Rivers. Historically, the principal mechanism of introduction into the Bay has been fouling, boring, and release of ballast dwelling organisms. Introduced species include snails, shrimp, plankton, and crabs. As mentioned in Section 3.3.2 (Marine Biology), many of the taxa observed inhabiting both the intertidal and soft substrate subtidal habitats at the VMT Site are introduced species.

The Marine Invasive Species Act (formerly the California Ballast Water Management for Control of Non-Indigenous Species Act of 1999) and California Public Resources Code Sections 71203 to 71207 specify required ballast water management practices and the control of ship fouling. Large ships entering state waters are required to comply with state and federal regulations concerning ballast water. Assuming compliance with these regulations, ballast from visiting boats and ships coming to San Francisco to use the VMT facilities would not be expected to pose a high risk of introducing non-native species.

The final concern with invasive marine organisms is the potential spread or the potential for accelerating the spreading of already introduced invasive species such as *Undaria* and *Sargossum*, which have established themselves in other regions of San Francisco Bay but have not been observed at the VMT Site (Appendix E-4). The proposed project could increase the risk of spreading non-native marine species attached to wood pilings or rock armoring/riprap being removed as part of the VMT Phase 1 wharf and Phase 2 dike construction activities. Spread of non-native species would be a **significant impact** (**Impact 3.3-11**) to Bay–Delta marine habitats and ecosystems. Mitigation measures to reduce the potential for spread of non-native species are identified in Section 3.3.5.

3.3.5 Mitigation Measures

Mitigation for Impact 3.3-1: Take of any active raptor nest is prohibited under Fish and Game Code Section 3503.5, and a significant impact would occur if project implementation disturbs an active nest.

MM-3.3-1 Should construction activities begin during the nesting season (February 15 through August 31), a qualified biologist shall conduct appropriate pre-construction surveys for any raptor or other nesting migratory bird nests within or immediately adjacent to the project site no more than 30 days before any construction activity commences. The pre-construction surveys shall be conducted between February and August and shall follow accepted survey protocols for nesting birds. The purpose of the surveys shall be to determine if active nests of special-status birds or migratory birds are present in the disturbance zone or within 500 feet of the disturbance zone boundary. If active nests are found, the biologist shall consult with the California Department of Fish and Wildlife to determine the appropriate buffer depending upon the species. Limits of construction to avoid impacts to an active nest during construction activities shall be established in the field with flagging, fencing, or other appropriate barriers and construction personnel shall be instructed on the sensitivity of nest areas. If ground-disturbing activities are delayed, then additional pre-disturbance surveys shall be conducted such that no more than 7 days elapse between the survey and ground-disturbing activities. The qualified biologist shall serve as a construction monitor during those periods when construction activities are to occur near active nest areas to avoid inadvertent impacts to these nests.

Mitigation for Impact 3.3-2: While it is unlikely that the Townsend’s big-eared bat or roost sites would be found on the project site, disturbance of roost sites would be a significant impact.

MM-3.3-2 No earlier than 30 days prior to initiation of construction activities, or such other period as may be approved in writing by the California Department of Fish and Wildlife (CDFW), a pre-construction survey shall be conducted by a qualified biologist (i.e., a biologist holding a CDFW collection permit and a Memorandum of Understanding with CDFW allowing the biologist to handle bats) to determine if active roosts of Townsend’s big-eared bat are present on or within 300 feet of the construction area. Surveys shall include the structure(s) planned for removal. If Townsend’s big-eared bat is detected roosting in any of the sites planned for removal, the project applicant shall consult with the CDFW to determine the appropriate course of action prior to initiation of any construction activities within 300 feet of the occupied roost. Under no circumstance shall an active roost be directly disturbed, and construction within 300 feet shall be postponed or halted, until the roost is naturally vacated, as determined by a qualified biologist. If bats do not vacate the roost voluntarily, and the roost site must be removed, the project applicant shall consult with CDFW to develop an eviction plan and secure any necessary permit for incidental take of the bat.

Mitigation for Impact 3.3-3: Removal of the estimated 444 creosote pilings at the VMT Site would result in a significant impact from the release of toxic PAHs from creosote piling fragments if the pilings are not removed properly.

MM-3.3-3 **Creosote Piling Removal Plan:** Prior to removal of any pilings from the VMT Site or the City of Vallejo Municipal Marina, VMT shall develop a Piling Removal Plan that begins with an inventory of all existing pilings at the wharf, documents their individual condition, and suitability for removal using Best Management Practices (BMPs). The Plan shall address, but not be limited to the following:

- Use of vibratory hammers (timbers jaws) as the primary method of removal for all wood pilings whose wood cores have not rotted away, making use of a vibratory hammer impracticable. If use of a vibratory hammer is not practicable for more than 20% of the pilings, the applicant shall provide verifiable documentation for which piles cannot be removed using a vibratory hammer. A demonstration effort may be required to validate the applicant’s justification for not being able to use vibratory removal equipment.
- Use of direct pull with a cable or chain and crane to remove pilings.
- Other feasible methods that remove the pilings in their entirety or with as little shredding of the pilings as possible.
- Use of excavators to remove deteriorated creosote wood pilings shall only be used where it would be ineffective to use vibratory hammers or other cited methods.
- Use of a floating boom, designed for deployment in high energy environments. The floating boom shall be used during all piling removal as well as dredging activities if excavators are needed to remove the wood pilings, leaving sections of the pilings in the Bay sediments which would be removed during dredging.
- Proper use and deployment of boom anchors to ensure that the boom remains open and recovers all floating debris, especially during removal of the outer rows of pilings.
- Regular removal of all collected debris within the boom on a regular schedule (minimum hourly). The boom shall be cleaned of all debris at the end of the day prior to shut down.
- Use of a skiff or chase boat to recover any floating debris that falls outside or escapes the containment boom.

- Proper onshore retention and disposal of creosote wood pilings and debris and the proper disposal of all pilings and debris.

This plan shall conform to all U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), Bay Conservation and Development Commission (BCDC), and City of Vallejo permit conditions and be reviewed and approved by the City of Vallejo and a third-party independent environmental mitigation monitor.

Mitigation for Impacts 3.3-4 and 3.3-9: The deliberate or accidental release of construction and deconstruction materials into the Napa River and the Bay–Delta ecosystem could result in a significant impact to special-status species and the Bay–Delta ecosystem in general.

MM-3.3-4 **Construction/Deconstruction Pollution Prevention Plan:** Prior to any deconstruction of the existing wharf, removal of any pilings, removal or burial of existing shoreline armoring/riprap, and construction of the new wharf and dike, VMT shall prepare and implement a Construction/Deconstruction Pollution Prevention Plan. This plan shall detail all steps to be taken, including selection of equipment, operational procedures, on-site monitors, etc. that will be employed to ensure that no construction or deconstruction debris is accidentally deposited or remains in Napa River or Bay–Delta waters and therein pose a threat to special-status fish species, marine mammals, and any Bay–Delta ecosystems. This plan shall conform to all USACE, RWQCB, BCDC, and City of Vallejo permit conditions and be reviewed and approved by the City of Vallejo and a third-party independent environmental mitigation monitor. The plan shall include but not be limited to:

- Training of all personnel engaged in construction/deconstruction activities as to the importance of preventing any materials, especially hydrocarbon containing materials from entering the water.
- Measures to be implemented to prevent foreign materials (e.g., wood scraps, wood preservatives, fuels, lubricating oils, hydraulic fluids, other chemicals, etc.) from entering the Napa River or other Bay–Delta waters. This requirement shall include, but not be limited to:
    - Installation of secondary containment around all vehicle fueling and servicing locations on site.
    - Abundant on-site closable trash containers in which all packaging materials and trash can be placed. Frequent removal and replacement of all trash containers shall occur to ensure that adequate empty containers are on site at all times.

  - Provision of labeled and separate containers for different types of recyclable materials (metals, plastic, other) and trash (hazardous and non-hazardous).
  - Effective on-site stormwater containment during all construction and deconstruction activities that prevents any on-site water from reaching Bay and River waters.
  - All equipment and materials shall be temporarily or permanently stored or placed a sufficient distance away from the waterfront to prevent accidental releases of fuels, lubricants, fluids, packaging, etc. from quickly reaching the Napa River before corrective actions can be implemented.

- For any work on or beneath fixed decking, heavy-duty mesh containment netting or other engineering approach shall be maintained below all work areas where construction discards or other debris could enter the water.
- A floating containment boom, netting, or functional equivalent shall be placed around all active portions of a construction/deconstruction site where any floating debris could enter the water. Similar containment shall be placed around any locations where creosote wood pilings are being removed. Deployment anchors shall be used with all booms to ensure that the boom remains open and capable of collecting any floating debris.
- All floating booms or similar containment devices used to collect floating debris as well as any temporary decking or netting placed under overwater structures shall be cleaned daily or more frequently if significant debris is being collected. During active creosote piling removal, the boom shall be cleaned hourly of any collected debris.
- In addition to providing booming, a small, motored skiff/chase boat shall be on site to chase and recover any floating debris that escapes the containment booming.
- Use of a grizzly screen on the dredge spoil barges during all dredging activity to separate any pieces of creosote pilings removed from the Bay floor that were broken off below the seafloor during removal.
- Adequate spill prevention measures shall be in place to prevent the transfer of any hydrocarbon materials from entering the water while equipment is being used during construction and deconstruction, as well as when being serviced and/or parked.
- Provisions shall be made to ensure that no external wrapping, internal packing materials, strapping, pallets, boxes, crates, drums, or other associated waste

material from staged on-site construction materials can enter the Napa River or Bay–Delta waters.

Mitigation for Impact 3.3-5: Based on the potential for underwater noise generated from impact hammer pile driving of 24-inch concrete and 30- and 36-inch steel pipe pilings for the construction of the Phase 1 wharf and Phase 2 dike, the potential impact to special-status fish species, including salmon, steelhead, sturgeon, and especially longfin and delta smelt and Sacramento splittail, would be significant.

Mitigation for Impact 3.3-10: Use of an impact hammer for pile driving of new 24-inch concrete and 30- and 36-inch steel piles can be expected to result in underwater noise levels that can result in permanent auditory damage to migrating fish, especially delta and longfin smelts, Sacramento splittail, and juvenile steelhead and salmon. This impact would be significant.

MM-3.3-5 **Impact Hammer Pile Driving Noise Reduction for Protection of Fish:** Prior to the start of construction, VMT shall develop a National Oceanic and Atmospheric Administration Marine Fisheries Service (NOAA Fisheries)-approved sound attenuation reduction and monitoring plan. This plan shall provide detail on the sound attenuation system, detail methods used to monitor and verify sound levels during pile driving activities, and all BMPs to be taken to reduce impact hammer pile-driving sound in the marine environment to an intensity level of less than 183 decibels (dB). The sound monitoring results shall be made available to the NOAA Fisheries. The plan shall incorporate but not be limited to the following BMPs:

- All impact pile driving for 24-inch concrete and 30- and 36-inch steel pilings, shall be conducted in strict accordance with the Long-Term Management Strategy (LTMS) work windows, during which periods the presence of special-status species in the project site is expected to be minimal.
- If pile installation using impact hammers must occur at times other than the approved LTMS work window, VMT shall obtain incidental take authorization from NOAA Fisheries, and CDFW to address potential impacts on delta and longfin smelt, Sacramento splittail, Chinook salmon, steelhead trout, and green sturgeon, and to implement all requested actions to avoid impacts.
- Steel sheet pile will be installed using vibratory hammers and the use of impact hammers kept to the bare minimum.
- If exceedance of noise thresholds established and approved by NOAA Fisheries occur, a contingency plan using bubble curtains or an air barrier will be implemented to attenuate sound levels to below thresholds.

- The hammer will be cushioned using a minimum 12-inch-thick wood cushion block during all impact hammer pile driving operations. Cushion blocks will be replaced frequently to maintain maximum sound reduction.
- Other BMPs will be implemented as appropriate to reduce underwater noise levels to acceptable levels.

Mitigation for Impact 3.3-6: There would be a potential for noise disturbance from proposed pile driving activities to affect marine mammals if conducted when the probability of sea lions and harbor seals being present is highest. Depending on when pile driving activities would be conducted for the VMT project component, the potential effects of underwater noise from pile driving on marine mammals could be significant.

MM-3.3-6 **Pile Driving Noise Reduction for Protection of Marine Mammals:** As part of the NOAA Fisheries-approved sound attenuation-monitoring plan required in MM-3.3-5, VMT shall take actions in addition to those listed in MM-3.3-5 to reduce the effect of underwater noise transmission on marine mammals. These actions shall include at a minimum:

- A 1,600-foot (500-meter) safety zone shall be established and maintained around the sound source, for the protection of marine mammals in the event that sound levels are unknown or cannot be adequately predicted.
- Work activities shall be halted when a marine mammal enters the 1,600-foot (500-meter) safety zone and shall cease until the mammal has been gone from the area for a minimum of 15 minutes.
- A “soft start” technique shall be employed in all pile driving, giving marine mammals an opportunity to vacate the area.
- Sound levels below 90 A-weighted decibels (dBA) shall be maintained in air when pinnipeds (seals and sea lions) are present.
- An NOAA Fisheries-approved biological monitor will conduct daily surveys before and during impact hammer pile driving to inspect the work zone and adjacent Bay waters for marine mammals. The monitor will be present as specified by NOAA Fisheries during the impact pile-driving phases of construction.

Mitigation for Impact 3.3-7: The potential for impacts on sensitive species from artificial night lighting on the new wharf and dike, as well as from improved shoreside facilities and buildings, would result in a significant impact.

MM-3.3-7 **Wharf Lighting:** VMT shall develop and implement a wharf lighting plan that minimizes to the maximum extent practicable and with regard to operational and personnel safety, artificial lighting installed on and adjacent to the VMT wharf. This plan shall include but not be limited to:

- Use of fully shielded, downward casing, low-voltage, sodium, LED, or non-yellow-red spectrum lights that are well shielded to restrict the transmittance of artificial light over the water.
- Restriction of artificial lighting to those areas of the wharf and adjacent staging areas that require lighting.
- Directing all wharf and near wharf lighting to illuminate only the wharf and ground and not adjacent Napa River waters or the sky.

Mitigation for Impact 3.3-8: Wharf maintenance or pile replacement would have similar potential effects and affected special-status species as initial site dredging, piling removal, and replacement, as well as expected recovery of marine biota following the activity. Although the application of BMPs, including adherence to LTMS acceptable work windows, would reduce the potential impact to special-status species, the impact would be significant without mitigation.

Refer to **MM-3.8-1** in Section 3.8, Hydrology and Water Quality.

Mitigation for Impact 3.3-11: The proposed project could increase the risk of spreading non-native marine species attached to wood pilings or rock armoring/riprap being removed as part of the VMT Phase 1 wharf and Phase 2 dike construction activities. Spread of non-native species would be a significant impact to Bay–Delta marine habitats and ecosystems.

MM-3.3-9 **Invasive Marine Species Control:** Prior to any in-water deconstruction activities at the VMT Site, VMT shall develop and implement an Invasive Species Control Plan. The plan shall be prepared in consultation with the RWQCB, the U.S. Coast Guard, and California State Lands Commission Marine Invasive Species Program personnel. Provisions of the plan shall include but not be limited to the following:

- Environmental training of construction personnel involved in the removal of pier pilings or intertidal or subtidal shoreline armoring/riprap to inform them about invasive marine species in San Francisco Bay that might be attached to removed structures.
- Actions to be taken to prevent the release and spread of marine invasive species, especially algal species.

- Procedures for the safe removal and disposal of any invasive taxa observed on the removed structures prior to disposal.
- A post-construction report identifying what, if any, invasive species were found attached to removed equipment and materials and the treatment/ handling of identified invasive species.

3.3.6 Level of Significance after Mitigation

Impact 3.3-1: Implementation of MM-3.3-1 would reduce the potential impact to nesting birds during construction of the proposed project to a **less-than-significant** level.

Impact 3.3-2: Implementation of MM-3.3-2 would reduce the potential impact to Townsend's big-eared bat during construction of the proposed project to a **less-than-significant** level.

Impact 3.3-3: Implementation of MM-3.3-3 would reduce the potential impact due to the removal of creosote pilings to a **less-than-significant** level.

Impacts 3.3-4 and 3.3-9: Implementation of MM-3.3-4 would reduce the potential impacts related to deliberate or accidental discharge of construction and deconstruction materials into project site waters to a **less-than-significant** level.

Impacts 3.3-5 and 3.3-10: Implementation of MM-3.3-5 would reduce the potential impacts to special-status fish species from pile driving to a **less-than-significant** level.

Impact 3.3-6: Implementation of MM-3.3-6 would reduce the potential impact to marine mammals from pile driving to a **less-than-significant** level.

Impact 3.3-7: Implementation of MM-3.3-7 would reduce the potential impacts on sensitive species from artificial night lighting to a **less-than-significant** level.

Impact 3.3-8: Implementation of MM-3.8-1 (Section 3.8, Hydrology and Water Quality) would reduce the potential impacts to special-status species due to wharf maintenance and pile replacement to a **less-than-significant** level.

Impact 3.3-11: Implementation of MM-3.3-8 would reduce the potential impact due to the increased risk of spreading non-native marine species to a **less-than-significant** level.

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DUDEK

8301

SOURCE: WRA Environmental Consultants 2007

FIGURE 3.3-1

Vegetative Communities

VALLEJO MARINE TERMINAL AND ORCEM PROJECT DRAFT EIR

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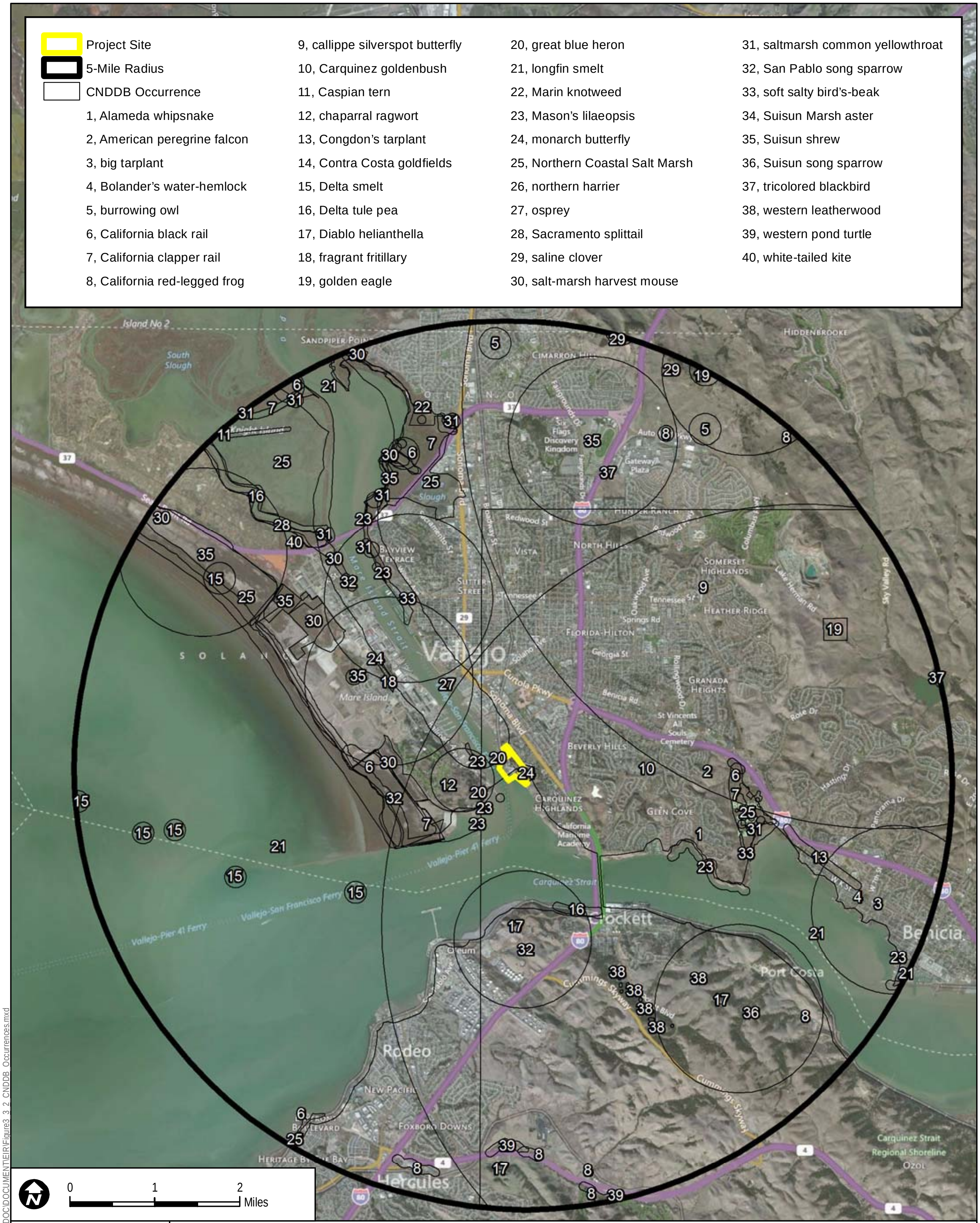

SOURCE: Bing 2014, CDFW

FIGURE 3.3-2

CNDDB Special-Status Species Occurrences

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3.4 CULTURAL RESOURCES

This section analyzes the potential impacts of the Vallejo Marine Terminal (VMT) and Orcem projects (proposed project) with respect to cultural resources and recommends mitigation measures where necessary to reduce or avoid significant impacts. The information provided in this section is based on the *Historic Resources Evaluation Report for the Sperry Flour Company Site* prepared by Carey and Co. Inc. in 2008 and updated in 2014 (Appendix F) and an archaeological resource investigation completed by Dudek in 2014 (Appendix G). All figures referenced in this section are provided at the end of the section.

3.4.1 Regulatory Setting

Federal

National Historic Preservation Act

The National Historic Preservation Act (16 U.S.C. 470 et seq.) establishes the nation's policy for historical preservation and sets in place a program for the preservation of historical properties by requiring federal agencies to consider effects to significant cultural resources (e.g., historical properties) prior to undertakings.

Section 106 of the National Historic Preservation Act requires federal agencies to take into account the effects of projects on historical properties (resources included in or eligible for the National Register of Historic Places (NRHP). It also gives the Advisory Council on Historic Preservation and the State Historic Preservation Office an opportunity to consult. Federal agencies issuing permits for the proposed project will be required to comply with National Historic Preservation Act requirements.

Executive Order 11593, Protection and Enhancement of the Cultural Environment

Executive Order 11593 (36 FR 8921) (1) orders the protection and enhancement of the cultural environment through requiring federal agencies to administer the cultural properties under their control in a spirit of stewardship and trusteeship for future generations; (2) initiates measures necessary to direct their policies, plans, and programs in such a way that federally owned sites, structures, and objects of historical, architectural, or archaeological significance are preserved, restored, and maintained for the inspiration and benefit of the people; and (3) in consultation with the Advisory Council on Historic Preservation, institutes procedures to assure that federal plans and programs contribute to the preservation and enhancement of non-federally owned sites, structures, and objects of historical, architectural, or archaeological significance.

State

California Public Resources Code

California Public Resources Code Sections 5097–5097.6 stipulate that the unauthorized disturbance or removal of archaeological, historical, or paleontological resources located on public lands is a misdemeanor. It prohibits the knowing destruction of objects of antiquity without a permit (expressed permission) on public lands and provides for criminal sanctions. This section was amended in 1987 to require consultation with the Native American Heritage Commission (NAHC) whenever Native American graves are found. Violations for taking or possessing remains or artifacts are felonies.

California Public Resources Code Section 5097.5 states that "no person shall knowingly and willfully excavate upon, or remove, destroy, injure, or deface, any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, rock art, or any other archaeological, paleontological or historic feature situated on public lands, except with the express permission of the public agency having jurisdiction over the lands."

California Register of Historical Resources

The California Register of Historical Resources (CRHR) is used in the consideration of historical resources relative to significance for purposes of the California Environmental Quality Act (CEQA). The CRHR includes California State Historical Landmarks, eligible Points of Historical Interest, and resources listed, or formally determined eligible for listing, in the NRHP. Properties of local significance that have been designated under a local preservation ordinance (local landmarks or landmark districts), or that have been identified in a local historical resources inventory, may be eligible for listing in the CRHR and are presumed to be significant resources for purposes of CEQA unless a preponderance of evidence indicates otherwise.

Generally, a resource shall be considered by the lead agency to be "historically significant" if the resource meets the criteria for listing in the CRHR (California Public Resources Code Section 5024.1; 14 CCR 4852), consisting of the following:

1. It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States; or
2. It is associated with the lives of persons important to local, California, or national history; or
3. It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master, or possesses high artistic values; or
4. It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

Evaluation for eligibility to the CRHR requires an establishment of historic significance before integrity is considered. There are seven aspects of integrity including the following: location, design, setting, materials, workmanship, feeling, and association. Definitions of these seven aspects are provided below.

Integrity is the authenticity of a historical resource's physical identity as evidenced by the survival of characteristics or historic fabric that existed during the resource's period of significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. The question of integrity is answered by whether or not the property retains the identity for which it is significant.

Location is the place where the historic property was constructed or the place where the historic event occurred. The relationship between a property and its historic associations will be destroyed if the physical characteristics of the historic property no longer exist.

Design is the combination of elements that create the form, plan, space, structure, and style of a property.

Setting is the physical environment of a historic property. Setting refers to the character of the place in which the property played its historical role. It involves how, not just where, the property is situated and its relationship to surrounding features and open space. Setting often reflects the basic physical conditions under which a property was built and the functions it was intended to serve.

Materials are the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property.

Workmanship is the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory. Workmanship is generally not used as a measure of integrity when looking at areas, sites, and districts. It is not evaluated here as the historic resources on site do not present physical evidence of a craft, artisan's labor or skill, or innovative period techniques.

Feeling is a property's expression of the aesthetic or historic sense of a particular period of time. Feeling results from the presence of physical features that, taken together, convey the property's historic character.

Association is the direct link between an important historic event or person and a historic property. A property retains association if it is the place where the event or activity occurred and is sufficiently intact to convey that relationship to an observer.

California's list of special considerations includes some allowances for moved buildings, structures, or objects, as well as lower requirements for proving the significance of resources that are less than 50 years old and a more elaborate discussion of the eligibility of reconstructed buildings.

In addition to separate evaluations for eligibility to the CRHR, the state will automatically list resources if they are listed or determined eligible for the NRHP through a complete evaluation process.

The California Historic Resource Status Codes (status codes) are a series of ratings created by the State Historic Preservation Office to quickly and easily identify the historic status of resources listed in the state's historic properties database. These codes were revised in August 2003 to better reflect the many historic status options available to evaluators. The following are the seven major status code headings:

- Properties listed in the National Register or the California Register.
- Properties determined eligible for listing in the National Register or the California Register.
- Appears eligible for National Register or California Register through Survey Evaluation.
- Appears eligible for National Register or California Register through other evaluation.
- Properties recognized as historically significant by local government.
- Not eligible for listing or designation.
- Not evaluated for National Register or California Register or needs revaluation.

California Environmental Quality Act

CEQA requires lead agencies to determine if a proposed project would have a significant effect on archaeological resources (California Public Resources Code, Sections 21000 et seq.). As defined in Section 21083.2 of the California Public Resources Code, a "unique" archaeological resource is an archaeological artifact, object, or site about which it can be clearly demonstrated that without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- It contains information needed to answer important scientific research questions, and there is a demonstrable public interest in that information.
- It has a special and particular quality, such as being the oldest of its type or the best available example of its type.
- It is directly associated with a scientifically recognized important prehistoric or historic event or person.

In addition, CEQA Section 15064.5 broadens the approach to CEQA by using the term “historical resource” instead of “unique archaeological resource.” The CEQA Guidelines recognize that certain historical resources may also have significance. Further, the CEQA Guidelines recognize that a historical resource includes: (1) a resource in the California Register; (2) a resource included in a local register of historical resources, as defined in Public Resources Code Section 5020.1(k), or identified as significant in a historical resource survey meeting the requirements of Public Resources Code Section 5024.1(g); and (3) any object, building, structure, site, area, place, record, or manuscript a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the lead agency’s determination is supported by substantial evidence in light of the whole record.

If a lead agency determines that an archaeological site is a historical resource, the provisions of Section 21084.1 of the California Public Resources Code and Section 15064.5 of the CEQA Guidelines apply. If an archaeological site does not meet the criteria for a historical resource contained in the CEQA Guidelines, then the site is to be treated in accordance with the provisions of California Public Resources Code Section 21083.2, and is considered a unique archaeological resource. The CEQA Guidelines note that if an archaeological resource is neither a unique archaeological resource nor a historical resource, the effects of the project on those resources shall not be considered a significant effect on the environment (CEQA Guidelines, Section 15064.5(c)(4)).

California Health and Safety Code

California law protects Native American burials, skeletal remains, and associated grave goods, regardless of their antiquity, and provides for the sensitive treatment and disposition of those remains. The California Health and Safety Code, Section 7050.5, requires that if human remains are discovered in any place other than a dedicated cemetery, no further disturbance or excavation of the site or nearby area reasonably suspected to contain human remains shall occur until the county coroner has examined the remains (Section 7050.5b). If the coroner determines or has reason to believe the remains are those of a Native American, the coroner must contact the NAHC within 24 hours (Section 7050.5c). The NAHC will notify the Most Likely Descendant. With the permission of the landowner, the Most Likely Descendant may inspect the site of discovery. The inspection must be completed within 24 hours of notification of the Most Likely Descendant by the NAHC. The Most Likely Descendant may recommend means of treating or disposing of, with appropriate dignity, the human remains and items associated with Native Americans.

Local

City of Vallejo General Plan

The following goals, objectives, and policies in the City's General Plan (City of Vallejo 1999), are applicable to cultural resources.

Historic Preservation Goal: Preserve and improve historically and architecturally significant structures and neighborhoods.

<u>Objectives:</u>

1. Develop pride and awareness of Vallejo's heritage, both locally and elsewhere.
2. Assist property owners in the restoration of significant buildings.
3. Protect significant buildings from exterior alterations that would diminish their historic or architectural significance.
4. Prevent the demolition of significant buildings when it is economically feasible to restore them.

<u>Policies:</u>

1. Promote Vallejo's heritage.
2. Assist property owners in their restoration efforts. This includes providing information on preservation resources and assisting in the placement of structures on the National Register of Historic Places.
3. The City will regulate changes in the exteriors of structures in the Heritage District, Historic District, and designated City landmarks to enhance the value of Vallejo's heritage.
4. The State Historic Building Code will be used as permitted by state law and the State's Architect's Office on any structure on the Historic Resources Inventory or in the Architectural Heritage and the St. Vincent's Historic Districts.

3.4.2 Existing Conditions

Historical Setting

Site History

In 1869, Abraham Dubois Starr convinced the Southern Pacific Railroad to extend tracks to the current project area in Vallejo, on which Starr subsequently constructed a flour mill, dock, and warehouse. Starr deemed the site ideal for a flour mill because of its proximity to Mare Island

and Mare Island Strait, which created easy access to both the San Francisco Bay and, hence, the Pacific Ocean, as well as to the San Joaquin Delta, which provided water access to inland California. The railroad extension connected the site to the newly completed transcontinental railroad, which, in turn, connected the mill to all points along that route, from the Pacific to the Atlantic. Only portions of the Starr Mill and dock remain, but the site served continuously from 1869 to 2004 as one of the most important flour mills in California. Port Costa Flour Company bought the property in 1895, followed by Sperry Flour Company in 1910. At the time, Sperry Flour Company was the largest grain products and flour milling corporation on the Pacific Coast, and eventually the third largest flour company in the nation. Four of the historically significant buildings at the site – the mill, silos, administrative building, and garage – were built during World War I in response to the Allies' significantly increased demand for American-made flour. Because it had the most modern facilities and participated in the wartime effort to supply flour to soldiers and civilians in the United States and abroad, the Vallejo plant was the most significant in the Sperry empire. The manager's house, a model of the First Bay Area Tradition, predated these buildings, but achieved its current form during this same period of wartime expansion. General Mills Corporation acquired Sperry Company and the Vallejo site in 1929 and made relatively minor changes. Apart from a few very brief stoppages, mills at the site continuously produced flour and feed for 135 years.

While the history of this site in the flour milling industry dates back to 1869, its period of significance extends from 1917 to 1920, the period when the flour milling facility was greatly expanded in response to the increased demand for American flour spurred by World War I. The United States government strictly curtailed construction activities during World War I to projects that directly benefited the war effort, and increased national and international demand for flour during the war prompted the construction of the mill, silos, administrative building, and garage at Sperry's Vallejo site. In keeping with its newly achieved status as the mill of greatest importance within the Sperry Flour Company empire, the company also remodeled the manager's house, enlarging it to conform with the then popular Bay Tradition style of domestic architecture. Increased production capacity at the mill rendered the original Starr Mill and warehouse inadequate, so the company also added on to the warehouse and wharf. Although that building and warehouse disappeared long ago, the extant pilings and dock date at the latest to this period of significance. Some of the pilings may date to as early as 1869. The Vallejo site's importance within the Sperry Flour Company had waned by the mid-1920s.

Few changes occurred to the Sperry Flour Company site before World War II, with the exception of a fire on August 30, 1934, that destroyed the bulkhouse that dated to between 1910 and 1916.

The site's architecture, along with its nearly 150-year association with flour milling for the most powerful flour companies in California and the nation, and its intimate associations with World War I render the Sperry Flour Company a valuable historic resource.

Existing Structures

The 2008 Historic Resources Evaluation Report for the Sperry Flour Company Site identified six structures (flour mill, grain silos, administrative building, garage, manager's house, and dock) that were potential historic resources with a California Historic Resource Status Code of 3S, Appears Eligible for National Register or California Register through Survey Evaluation. In October 2014, Carey and Company verified and reevaluated the historical status of these same structures. The reevaluation resulted in a modification to the status of the historic resources, and changes the historical status of the structures from structures individually eligible for listing in the NRHP to contributing resources to a potential Sperry Flour Mill Historic District. In addition, Carey and Company added one other structure, the barn, to the list of contributing resources (see Figure 3.4-1, Historical Resources Survey Map). The Sperry Flour Mill is considered a *potential* historic resource because the buildings have not gone through a formal designation process and are not listed on any local, state, or federal register of historic resources. However, as described in Section 3.4.1, the CEQA Guidelines recognize that a historical resource includes resources identified as significant in a historical resource survey meeting the requirements of California Public Resources Code Section 5024.1(g).

Contributing resources include buildings, structures, and objects that define the historic integrity and physical character that make a potential historic district eligible for listing in the CRHR. Contributing properties are considered integral parts of the historic context of multiple resource properties and key to historic associations, feeling, setting, and its historic architectural qualities. The complex of seven former Sperry Flour Company buildings creates an industrial site dating to World War I during which time the site experienced expansion.

The project area includes 16 structures, each of which is described below, in order of (sometimes estimated) date of construction. The location of these structures is shown on Figure 3.4-1, Historical Resources Survey Map.

Wood Dock and Wood Pilings – c. 1869–1919

Pilings associated with the dock upon which the original Starr Mill warehouse stood run along the central western portion of the site. Horizontal planks cover the pilings at the most southwesterly corner and feature markings where railroad tracks once ended.

The dock retains integrity of location, setting, and association, having never been moved and still adjacent to an industrial site. While the dock's integrity of design, materials, workmanship, and feeling have been compromised by the loss of considerable material, this loss does not prevent this simple dock structure from conveying its historic significance. This dock conceivably tells a story of the mill site from its earliest days in 1869 and appears to be eligible for the California Register under criterion 1 as a contributing structure to a potential historic district.

Manager's House – c. 1901, altered c. 1917 and after 1919

The manager's house dates to the early 1900s. The current look and plan of the building date to around 1917, during the period of significance for the site. Sperry Flour Company enlarged the house to accommodate a manager of the then most important facility within the company's flour empire. The house also embodies defining characteristics of the First Bay Area Tradition, a regional style that influenced domestic architecture for nearly a century and which contributed to the emergence of a regional identity. Set apart from the industrial buildings, the house creates a sylvan contrast to the modern industrial landscape. Clad with unpainted brown shingles and adorned with no exterior decoration, the house blends into the landscape and allows the natural setting to provide ornamentation.

The manager's house has undergone numerous alterations over the years. Despite these changes, Carey and Company has determined that this structure retains sufficient integrity to convey its historic significance. Alterations to the structure are not obvious upon viewing it; Carey and Company had to compare Sanborn maps to periodize them and determine how exactly the building changed over time. The earliest images of this building indicate that it has always been clad with unpainted wood shingles, making it an early example of the First Bay Area Tradition. Subsequent alterations have always respected this historical precedent, allowing the building to continue to express historical character. Moreover, the most significant alterations were made 90 years ago, and although the house has deteriorated, the structure as it appeared then remains largely uncompromised. This house, therefore, exudes an overall historical character that dates to World War I, the period of significance to which the other historical buildings at the plant belong. The manager's house appears to be eligible for the CRHR under criteria 1 and 3 as a contributing structure to a potential historic district. It should be noted that the house is in a state of substantial disrepair.

The driveway leading up to the manager's residential complex is lined with rock walls on the north side. The construction date of the rock walls has not been determined. Thus, the rock walls may or may not have been constructed within the period of significance. Since no definitive construction date of the walls was found, they are not a contributing resource to a potential historic district.

Barn – c. 1901–1919

Sanborn maps indicate that the barn was constructed between 1901 and 1919. The barn was part of the manager's residential complex on the site. The corrugated metal cladding may not be original to the structure, but the building retains sufficient integrity with its wood sash windows and overall form. Since the barn is directly linked to the residential complex of the site manager and was used by the site manager during the heyday of the plant's operation, the building may be eligible for the CRHR under criterion 1 as a contributing structure to a potential historic district. This structure is also in a state of severe disrepair.

Grain Silos and Elevator – 1917

Like the mill, the silos derive historical significance from their association with World War I and the emergence of the Vallejo plant as the most important facility in the most important grain milling corporation of the Pacific Coast. These silos, built in the most modern methods, allowed the mill to store the grain necessary to produce flour for American and European soldiers and civilians, and their monumental scale speaks to massive quantity of flour that the mill was expected to produce. The location of the silos, directly behind the mill, further underscores the intimate relationship between the two buildings and their common function to produce flour on an unprecedented scale for both the Vallejo mill and the Sperry Flour Company.

Also like the mill, the silos retain a high level of integrity. With the exception of metal slider windows replacing some multi-lite awning windows within the large, multi-lite fixed metal windows of the top stories of the building, the silo remains virtually unchanged since its construction in 1917–1918. This lends the silos integrity of design, materials, and workmanship. The scale and location of the silos directly behind the mill remains intact as well, fostering integrity of setting, association, and feeling. This high level of integrity enables the silo to convey its historic relationship to the mill, their collective contribution to World War I, and the significance of the Sperry Flour Company in California and the grain industry. The grain silos appear to be eligible for the CRHR under criterion 1 as a contributing structure to a potential historic district.

Administrative Building – 1917

Built in 1917, the administrative building belongs to the site's period of significance (1917–1920) and reflects the significant growth of the plant both in size and prestige within the Sperry Flour Company and milling industry. Like the mill and silos, the administrative building reflects a relatively early example of reinforced concrete construction. Even more than the mill and silos, this building demonstrates early efforts to use concrete for aesthetic purposes rather than just functional ones. Particularly notable elements include the raised relief on the cornice, the inset panels on the window surrounds, molded detailing at the base of the building, and the pilasters, pediment, and entablature of the entry surround. These classical features also contribute to the historic feeling of the building.

The building retains a high level of integrity. It has not been moved, and its surroundings have changed little since it was constructed, lending the building integrity of location, setting, and association. The building has undergone some alterations, including the addition of metal awnings, filling in of some rear windows, and replacement of the front door and windows. While these alterations affect integrity of materials and workmanship, they are easily reversible and do not affect integrity of design, scale, plan, or overall expression of the aesthetic and historic feeling of the building. The building retains sufficient integrity to convey its historic significance. The administrative building appears eligible for the CRHR under criteria 1 and 3 as a contributing building to a potential historic district.

Flour Mill – 1917

Architecturally, the Flour Mill building is a relatively early example of reinforced concrete skeletal frame construction, which allowed for more windows and, therefore, natural light and ventilation in a factory environment. The brick cladding, entablature, and parapet also reflect an effort to combine aesthetics with function in industrial design, as well as experimentation with the aesthetic potential of concrete itself. The building's relationship to the mill further enhanced the architectural composition of the mill. Located directly in front of the silos and with a hillside serving as a backdrop, the mill not only produced flour, but created an unusually picturesque statement for industrial architecture. The mill is also significant for its association with World War I, a defining event of the twentieth century and an event of international importance. Since the federal government curtailed most construction not related to the war effort, it is entirely likely that the mill would not have been built if it had not been for the importance of and need for American grain milling capacity during that period. Whereas the Sperry Company initially intended to build a simple warehouse for its old mill, demand for flour during wartime prompted the company to build the most modern facility possible, which allowed it to mill grain at a rate necessary to feed American and European soldiers and civilians alike. Subsequent to the war, the new mill also catapulted the Vallejo plant to the most important position in the pantheon of the most powerful Pacific Coast milling company's numerous facilities.

The building has undergone some alteration. Almost all of the windows are non-original, as are the metal awnings, rooftop mechanical units, a conveyor shed from the mill to the bakery warehouse, and a partially enclosed passageway supported by metal posts and clad with corrugated fiberglass sheets that is located at the northwest end of the building. The conveyor shed at the northwest end of the building dates to the construction of the mill, but does not retain a high level of integrity; it has been truncated and reclad.

While these alterations affect the mill's integrity of materials, design, and workmanship, the mill retains sufficient integrity to convey its architectural and historic significance. Alterations have occurred mostly to secondary features, and nearly all are reversible. Moreover, the building retains its original scale, plan, and overall design. In addition, the building has not been moved, and its setting, on the narrow strip of bedrock next to the Mare Island Strait with the silos and hillside serving as backdrop, has changed little, leaving the building with integrity of location, setting, feeling, and association. These factors enable the mill's ability to express its aesthetic intent, its function as a mill, and its historic role as the most important mill in the Sperry Flour Company during World War I and its immediate aftermath. The flour mill appears to be eligible for the CRHR under criteria 1 and 3 as a contributing building to a potential historic district.

Garage – 1918

The garage is the fourth and last structure on site to be built specifically in response to wartime demand for flour in the United States and Europe. Like the mill and administrative building, it is a reinforced concrete structure that combines aesthetic and functional considerations. The building retains a high level of integrity. Alterations include non-original roll-up doors and bricking in of one bay. Otherwise, the structure retains integrity of location, design, setting, materials, and workmanship, which contributes to its ability to express the aesthetics of the period in which it was built and its association with Sperry Flour Company’s expansion at the Vallejo plant in the wake of increased demand for flour during World War I. The garage appears eligible for the CRHR under criteria 1 and 3 as a contributing building to a potential historic district.

Warehouse – 1947

Although this building was completed in 1947 and therefore falls within the 50-year threshold for consideration for the CRHR, it falls well outside the period of historical significance of the mill site. Its style reflects post-World War II industrial architecture, but is not the work of a master or a rare and/or exceptional example of such postwar architecture that conveys a significant level of historical feeling in and of itself. As the architectural style does not conform to that of the property’s period of historical significance, it does not contribute to the historical feeling of the site. The building retains a high level of integrity, having undergone few significant alterations. The conveyor shed and bulkhouse adjacent to the building detract, however, from its historical integrity, as the former originally connected the building to the old Starr Mill and warehouse, while the latter did not exist until 1992. Because it is not associated with the site’s period of historic significance, this building does not appear to be eligible for the CRHR.

Manager’s Garage – c. 1950s

Sanborn maps indicate that a structure was built at this location between 1901 and 1919 and that this structure had an L-shaped plan. Its date of origin may therefore fall within the period of significance for the site of the former Sperry Flour Company mill. The current structure has a rectangular plan, suggesting that it has been altered significantly or is non-original and dates to some point after 1950. These factors alone highly compromise the historic integrity of the building. It does not retain sufficient integrity to convey its historical significance, and Carey and Company has determined that it is ineligible for the CRHR.

Old Bulkhouse – c. 1957

The old bulkhouse is 50 years old, just meeting the age requirement for the CRHR and NRHP. It has one notable feature: corrugated asbestos cladding. However, this material was not new to industrial design, and otherwise the building does not exhibit architectural distinction, is not associated with the life of an important person, will not yield information important to prehistory or history, and is not associated with significant events in the life of the property, city, state, or country. Therefore, Carey and Company has determined that the structure is not eligible for the CRHR.

New Bulkhouse – c. 1965, Forklift Repair – c. 1985, Welding Shop – c. 1985, Pipe Storage – c. 1985, Mill Run Canopy – 1986, Bakery Bulkhouse – 1992

These six additional structures do not meet the 50-year threshold and do not bear any characteristics that would warrant their listing on the CRHR. These structures do not exhibit exceptional architectural merit, any intimate association with a major historical event or pattern, or any association with a historical person. They are also unlikely to yield information that is important to history or prehistory.

Archaeological Setting

A records search for the proposed project was conducted by Dudek at the Northwest Information Center on October 15, 2014. Based on a review of the records, no archaeological resources have been previously recorded within the project site. The nearest previously recorded site is located approximately 0.5 mile from the site. Two previous cultural resources technical surveys have directly included the project site (see Appendix G). Dudek conducted an archaeological survey of the project site in May 2014. The Dudek archaeologist did not identify any archaeological sites or features within the project site.

A letter was sent to the NAHC on October 8, 2014, requesting a records search for identified Native American cultural resources in the project vicinity. A response was received on October 24, 2014, stating that “A record search of the sacred land file has failed to indicate the presence of Native American cultural resources in the immediate project area” (see Appendix G).

A review of the California State Lands Commission Shipwreck Database indicates that there is no record of marine archaeological resources in the vicinity in the project site (CSLC 2014).

3.4.3 Thresholds of Significance

The following criteria, included in Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.), will be used to determine the significance of potential cultural resources impacts. Impacts to cultural resources would be significant if the proposed project would:

A) Cause a substantial adverse change in the significance of a historical resource as defined in Section15064.5;

B) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section15064.5;

C) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature; or

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

3.4.4 Impact Discussion

A) Would the project cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?

VMT and Orcem Project Analysis

A "substantial adverse change" is defined in the CEQA Guidelines as "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired." Further, that the "significance of an historical resource is materially impaired when a project "demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for inclusion in the California Register of Historical Resources;" or "demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources..." or demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register of Historical Resources as determined by a lead agency for purposes of CEQA."

The proposed project involves demolition of existing buildings as well as an extensive amount of new construction and site work (grading, new asphalt or concrete driveways, new site features) that could impact the historical significance of buildings on the site. The Orcem project component would require demolition of the following buildings: grain silos and elevator, flour mill, old bulkhouse, new bulkhouse, welding shop, pipe storage, and forklift repair. The VMT project component would require demolition of the warehouse, bakery bulkhouse, and dock. The administrative building and garage would remain in their current location and would be reused by VMT for administrative and office uses. The manager's house, manager's garage, and barn would not be impacted by the project.

As described in existing conditions, the flour mill, grain silos, administrative building, garage, manager's house, barn, and dock are all contributing buildings to a potential Sperry Flour Mill Historic District. The remaining structures on the site were either not built during the period of significance and are therefore not contributing structures to the cultural and/or historic importance of the Sperry Mill, or do not meet the 50-year threshold for listing on the CRHR.

Although the administrative building and garage would not be demolished as a result of the proposed project, construction activities could cause both direct and indirect impacts to the administrative building and garage, which are contributors to a potential Sperry Flour Mill Historic District. The manager's house and barn are also contributing historic resources to a potential Sperry Flour Mill Historic District. However, they are located far enough away, about 185 feet, from construction activities that the potential for direct or indirect impacts is limited and would not rise to the level of a significant adverse impact. Such activities could include the operation of heavy machinery and drilling equipment, staging, storage of materials and dump trucks directly passing by the contributing resources. Construction activities could damage these historic architectural resources through destabilization, or physical contact. Also, depending on the nature and type of demolition and new construction on the project site, vibration-related impacts could have an effect on these historic resources. Trucks hauling materials associated with demolition and new construction to and from the project site could also potentially impact these resources. The proposed project would therefore result in a **significant impact** due to the potential for damage to the administrative building and garage during construction (**Impact 3.4-1**).

As described above, the proposed project would result in demolition of the flour mill, grain silos, and dock, which are all important components of the original Sperry Mill. Once demolished, the buildings would no longer retain historic integrity and would no longer be contributors to a potential historic district. The proposed demolition of the flour mill, grain silos, and dock, and extensive new construction and site work (grading, new asphalt or concrete driveways, new landscaping) would have a significant adverse effect on the integrity of a potential Sperry Flour Mill Historic District. The flour mill and grain silos are the most important structures that define a potential historic district and convey the historic significance of a potential historic district that justifies its eligibility for inclusion in the CRHR. Combined with the loss of the dock, the proposed project would result in the loss of such a potential historic district's integrity. As mentioned previously, integrity is defined as the authenticity of a historical resource's physical identity as evidenced by the survival of characteristics or historic fabric that existed during the resource's period of significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association, as discussed in detail below.

Location. In this case the flour mill and grain silos represent the most important physical characteristics that justify a potential historic district's eligibility for inclusion in the CRHR. Although relatively more minor, the dock is also one of the potential historic district's physical characteristics. These physical characteristics will be gone once the structures are demolished.

Design. With demolition of the three contributing resources and the construction of the proposed project, the design aspects of the potential historic district—its most important structures, the spatial relationships between all the contributing resources, and the layout and relationship of other existing, but not necessarily historic features—will be lost.

Setting. As a result of the demolition of two of the key contributing resources to a potential Sperry Flour Mill Historic District and one other lesser resource, the result will be the loss of the physical environment which will no longer reflect the basic physical conditions under which the property was first developed and the functions the Sperry Flour Mill was intended to serve.

Materials. With demolition of the three contributing resources, the physical elements that comprise a potential historic district and justify its eligibility for inclusion in the CRHR will be lost.

Workmanship. Workmanship is generally not used as a measure of integrity when looking at areas, sites, and districts. It is not evaluated here as the potential historic district does not present physical evidence of a craft, artisan's labor or skill, or innovative period techniques. Although workmanship can take into account vernacular methods of construction, the structures contributing to the significance of a potential historic district do not provide evidence of innovative technological practices or aesthetic principles.

Feeling. With demolition of two of the key contributing resources to a potential Sperry Flour Mill Historic District and one other lessor resource, the physical features that convey the character of the potential historic district will be lost.

Association. With demolition of two of the most important contributing resources to a potential historic district and one other lesser resource, the direct link to the Sperry Flour Mill will be severed, and the place will not be sufficiently intact to convey that relationship.

The administrative building and the garage would be retained and rehabilitated. Therefore, they would contribute to retaining the integrity of a potential historic district. However, they are relatively less important in defining the significance of a potential historic district than the flour mill and grain silos, and their retention would not be sufficient for a potential historic district to maintain its integrity.

Implementation of the proposed project would result in a **significant impact** on historic architectural resources due to the loss of integrity of a potential Sperry Flour Mill Historic District associated with demolition of the flour mill, grain silos, and dock (**Impact 3.4-2**).

Off-Site Improvements

The proposed project includes two off-site improvements that would take place at the City of Vallejo Municipal Marina located approximately 2 miles north of the project site: public access improvements and removal of existing deteriorated docks. These improvements do not involve alteration of any historic resources, and no historic resources would be affected by the improvements. Therefore, **no impact** would occur as a result of the off-site improvements.

B) Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?

VMT and Orcem Project Analysis

As described in existing conditions, no archaeological resources have been previously recorded within the project site. Further, based on inspection of subsurface exposures, the topography, and highly developed nature of the planned area of direct impact, there appears to be little potential for the unanticipated discovery of archaeological resources during project implementation. Nevertheless, there is potential for the inadvertent discovery of unknown archaeological resources during ground-disturbing activities associated with project construction, which could lead to an impact to archaeological resources. Therefore, impacts would be **potentially significant (Impact 3.4-3)**.

Off-Site Improvements

The proposed project includes two off-site improvements that would take place at the City of Vallejo Municipal Marina located approximately 2 miles north of the project site: public access improvements and removal of existing deteriorated docks. The public access improvements would involve installation of a new self-propelled personal watercraft launch ramp just north of the access ramp to K Dock at the south end of the marina. The proposed launch would consist of a pre-cast articulated concrete mat, approximately 10 feet wide by 60 feet long over a geotextile fabric. Installation of the launch ramp would occur within the existing Municipal Marina, which has been disturbed by dredging and development. The project would also involve the removal of existing deteriorated dock improvements within the water area at the north end of the marina. Approximately 80 14-inch-diameter creosote timber piles and deteriorated dock facilities would be removed from this portion of the marina. A review of the California State Lands Commission Shipwreck Database indicates that there is no record of marine archaeological resources in the vicinity in the Marina (CSLC 2014). Although there is little potential for unanticipated discovery of marine archaeological resources as a result of the off-site improvements, in the event an unanticipated discovery is made during implementation of the off-site improvements, impacts would be **potentially significant (Impact 3.4-4)**.

C) Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

VMT and Orcem Project Analysis

As described in Section 3.5, Geology and Soils, and shown in Figure 3.5-1, the area of the site to be developed is underlain by a mantle of artificial fills approximately 3 feet to 19 feet thick (increasing in thickness towards the San Francisco Bay). In the areas of the site to be developed, the existing fills are underlain by bay mud deposits. Based on the historical disturbances to the project site, the geologically young and unconsolidated nature of the affected sediments, the potential for significant paleontological resources to be present on the site is very low. However, construction of the retaining walls on the northeastern border of the site and excavations for structures that must be founded on bedrock could result in incidental disturbance to older, native sedimentary rock that shallowly underlies the hillside to the west, and that deeply underlies the proposed project’s development footprint. Due to the age and sedimentary marine origin of the bedrock underlying the site, it could contain fossils, but they would be more likely to consist of abundant marine invertebrates (e.g., foraminifera) than unique or significant vertebrate fossils.

Although the paleontological potential of rocks and sediment within the project’s disturbance footprint is very low, the potential remains for deep excavations to uncover potentially significant fossils within the bedrock underlying the site. For this reason, impacts would be **potentially significant** (**Impact 3.4-5**).

Off-Site Improvements

The proposed project includes two off-site improvements that would take place at the City of Vallejo Municipal Marina located approximately 2 miles north of the project site: public access improvements and removal of existing deteriorated docks, as described previously. The areas to be disturbed by the off-site improvements are underlain by bay mud deposits. Based on the historical disturbances to the Marina, the geologically young and unconsolidated nature of the affected sediments, the potential for significant paleontological resources to be present on the site is very low. Therefore, impacts would be **less than significant**.

D) Would the project disturb any human remains, including those interred outside of formal cemeteries?

VMT and Orcem Project Analysis

There is no evidence of human remains on the project site, and the potential for the inadvertent discovery of human remains on the project site is very low because there is no evidence of any historical camps or human settlement on the site. Additionally, existing regulations through California Health and Safety Code Section 7050.5 state that if human remains are discovered during project construction, no further disturbance shall occur until the County Coroner has made the necessary findings as to origin. Further, pursuant to California Public Resources Code Section 5097.98(b), remains shall be left in place and free from disturbance until a final decision as to the treatment and disposition has been made. If the County Coroner determines the remains are Native American, the NAHC shall be contacted within a reasonable time. Subsequently, the NAHC shall identify the Most Likely Descendant. The Most Likely Descendant shall then make recommendations and engage in consultations concerning the treatment of the remains as provided in California Public Resources Code Section 5097.98. Although the potential for human remains on the project site is very low, in the event that human remains are found on the site during project construction, impacts would be **potentially significant** (**Impact 3.4-6**).

Off-Site Improvements

The proposed project includes two off-site improvements that would take place at the City of Vallejo Municipal Marina located approximately 2 miles north of the project site: Public access improvements and removal of existing deteriorated docks. There is no evidence of human remains within the areas to be disturbed by the off-site improvements, and the potential for the inadvertent discovery of human remains is very low because there is no evidence of any historical camps or human settlement in this area. Additionally, existing regulations through California Health and Safety Code Section 7050.5 state that if human remains are discovered during project construction, no further disturbance shall occur until the County Coroner has made the necessary findings as to origin. Further, pursuant to California Public Resources Code Section 5097.98(b), remains shall be left in place and free from disturbance until a final decision as to the treatment and disposition has been made. If the County Coroner determines the remains are Native American, the NAHC shall be contacted within a reasonable time. Subsequently, the NAHC shall identify the Most Likely Descendant. The Most Likely Descendant shall then make recommendations and engage in consultations concerning the treatment of the remains as provided in California Public Resources Code Section 5097.98. Although the potential for human remains within the off-site improvement areas is very low, in the event that human remains are found during construction of the off-site improvements, impacts would be **potentially significant** (**Impact 3.4-7**).

3.4.5 Mitigation Measures

Mitigation for Impact 3.4-1: The proposed project would result in a significant impact to historic architectural resources due to the potential for damage to the administrative building and garage during construction.

MM-3.4-1a A historic preservation plan shall be prepared and implemented to aid in preserving those historic resources proposed to be retained within the original Sperry Mill site. These include the administrative building, garage, manager's house, and the barn, all of which shall be protected from direct or indirect impacts during construction activities (i.e., due to damage from operation of construction equipment, staging, material storage, and vibrations).

If deemed necessary upon further condition assessment of the buildings, the plan shall include the preliminary stabilization, prior to construction, of deteriorated or damaged materials or systems that may be hazardous.

At a minimum, the plan shall include:

- A requirement for the placement of perimeter fencing and/or signs around the historical resources to identify them as sensitive resources to be avoided;
- Guidelines for operation of construction equipment adjacent to historical resources;
- Guidelines for storage of construction materials away from the resources;
- Requirements for monitoring and documenting compliance with the plan; and
- Education/training of construction workers about the significance of the historical resources around which they would be working. The training program shall be prepared by a historical architect and approved by Planning Division staff.

The plan shall be prepared by a qualified architectural historian or historical architect who meets the Secretary of Interior's Professional Qualification Standards (36 CFR, Part 61). The plan shall be reviewed and approved by Planning Division staff. The project sponsor shall ensure that the contractor follows these plans. The protection plan, specifications, monitoring schedule, and other supporting documents shall be incorporated into the building permit application plan sets.

MM-3.4-1b Prior to construction, a historical architect and a structural engineer shall undertake an existing condition study of the administrative building and garage.

The purpose of the study would be to establish the baseline condition of the structures prior to construction. The documentation shall take the form of written descriptions and visual illustrations, including those physical characteristics of the resource that convey its historical significance and that justify its inclusion on, or eligibility for inclusion on, the California Register of Historical Resources. The documentation shall be reviewed and approved by Planning Division staff.

The historical architect shall make periodic site visits to monitor the condition of the resource, including monitoring of any instruments such as crack gauges. The historical architect shall consult with the structural engineer to ensure that character-defining features are protected, especially if any problems with character-defining features of the historic resource are discovered. If in the opinion of the monitoring team, substantial adverse impacts to the historic resource related to construction activities are found during construction, the monitoring team shall so inform the project sponsor or designated representative responsible for construction activities. The project sponsor shall adhere to the monitoring team's recommendations for corrective measures, including halting construction in situations where construction activities would imminently endanger the historic resource. The monitoring team shall prepare site visit reports and submit them for review and approval by Planning Division staff.

MM-3.4-1c Upon completion of construction activities at the proposed project site, the qualified architectural historian or historical architect shall document (e.g., with photographs and other appropriate means) the level of success in meeting the Secretary of the Interior's Standards for the Treatment of Historic Properties and in preserving the character-defining features of the identified historic resources. The documentation shall be submitted to Planning Division staff for review and approval.

The project sponsor shall ensure that repairs occur in the event of damage to the historic resources during construction. Repair work shall comply with the Secretary of the Interior's Standards for the Treatment of Historic Properties and shall restore the character-defining features in a manner that does not affect the eligibility of the historic property for the California Register of Historical Resources. All repairs shall be reviewed by Planning Division staff in consultation with the architectural historian or historical architect.

Mitigation for Impact 3.4-2: Implementation of the proposed project would result in a significant impact on historic architectural resources due to the loss of integrity of a potential Sperry Flour Mill Historic District associated with demolition of the flour mill, grain silos, and dock.

MM-3.4-2a Prior to the issuance of demolition or site permits, the project sponsor shall undertake Historic American Building Survey (HABS) documentation of the subject property, structures, objects, materials, and site features. The documentation shall be undertaken by a qualified professional who meets the standards for history, architectural history, or historic architecture (as appropriate), as set forth by the Secretary of the Interior's Professional Qualification Standards (36 CFR, Part 61). The documentation shall consist of the following:

Measured Drawings

The project sponsor shall engage the services of an architectural historian to conduct research to find plans and drawings of the structures on the project site that comprise the historic resources, most importantly those of the flour mill and grain silos. If plans are found and can be made available for reproduction, they shall be reproduced on archival materials, either archival bond paper or mylar.

If suitable plans are not available, an architectural historian or historical architect shall prepare sketch plans for the flour mill building. One sketch plan shall be made of the ground floor (including the warehouse). Another plan shall be made of one floor of the tower portion of the flour mill. In addition, sketch floor plans shall be made of the administrative building and garage.

An architectural historian or historical architect shall prepare a site plan, including the manager's house and grounds. Site plans prepared by the project sponsor can be used as a base.

Photography

Large format negatives shall be required. Photography shall be undertaken by a qualified professional with demonstrated experience in Historic American Buildings Survey photography and shall follow the HABS/HAER/HALS Photography Guidelines (National Park Service, Heritage Documentation Programs, 2011). Digital prints shall be acceptable.

Photography shall include context photographs, site features, and all structures on the project site that comprise the historic resources. The photographer shall consult with the architectural historian engaged in the measured drawings and historical report about the type and number of views required for the documentation of the potential historic district.

Historical Report

An architectural historian shall prepare a written Narrative Report based on HABS Guidelines for Preparing Written Historical and Descriptive Data. Carey and Company's previous report (2008) and the revised evaluation for this historic resources evaluation can be used in the preparation of the Narrative Report. The architectural historian shall make an effort to locate and conduct an oral history interview with Floyd Miller, who provided assistance with the 2008 report.

All documentation shall be submitted for review and approval by Planning Division staff prior to the issuance of final building occupancy permits. The final documentation shall be disseminated to the John F. Kennedy Library, Northwest Information Center, Sonoma State University (California Historical Resource Information System), and Vallejo Naval and Historical Museum.

MM-3.4-2b The project sponsor shall install permanent interpretive exhibits at the Vallejo Naval and Historical Museum that provide information to visitors and occupants regarding the history of the Sperry Flour Mill. The interpretive exhibit shall utilize images, narrative history, drawings, or other archival resources. The interpretive exhibits may be in the form of, but are not necessarily limited to plaques or markers, interpretive display panels. The interpretive exhibits shall be installed at a pedestrian friendly location, and be of adequate size to attract the interested public. The project sponsor's consultant shall submit conceptual and final designs to Planning Division staff for review and approval. Mitigation for Impact 3.4-3: Construction and excavations for structures on the site could result in incidental disturbance to native sedimentary rock and, although low, potential remains for deep excavations to uncover significant fossils, which would result in a significant impact.

Mitigation for Impacts 3.4-3 and 3.4-4: There is potential for the inadvertent discovery of unknown archaeological resources during ground-disturbing activities associated with project construction and the off-site improvements, which could lead to a significant impact to archaeological resources.

MM-3.4-3 In the event that archaeological resources (sites, features, or artifacts) are exposed during construction activities for the proposed project or the off-site improvements, all construction work occurring within 100 feet of the find shall immediately stop until a qualified archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards, can be retained to evaluate the significance of the find and determine whether additional study is warranted. Depending on the significance of the find under the California Environmental Quality Act (CEQA) (14 CCR

15064.5(f); California Public Resources Code, Section 21082), the archaeologist may record the find and allow work to continue. If the discovery proves significant under CEQA, additional work such as preparation of an archaeological treatment plan, testing, or data recovery may be warranted.

Mitigation for Impact 3.4-5: Although the paleontological potential of rocks and sediment within the project's disturbance footprint is very low, the potential remains for deep excavations to uncover potentially significant fossils within the bedrock underlying the site.

MM-3.4-4 If potential fossils are discovered by construction crews, all earthwork or other types of ground disturbance within 50 feet of the find shall stop immediately until a qualified professional paleontologist can assess the nature and importance of the find. Based on the scientific value or uniqueness of the find, the paleontologist may record the find and allow work to continue, or recommend salvage and recovery of the fossil. If treatment and salvage is required, recommendations shall be consistent with Society of Vertebrate Paleontology 1995 guidelines and currently accepted scientific practice, and shall be subject to review and approval by the City. Work in the affected area may resume once the fossil has been assessed and/or salvaged and the City, in consultation with the professional paleontologist, has provided written approval to resume work.

Mitigation for Impacts 3.4-6 and 3.4-7: Although the potential for human remains on the project site and within the off-site improvement areas is very low, in the event that human remains are found during project construction or implementation of the off-site improvements, impacts would be potentially significant.

MM-3.4-5 In accordance with Section 7050.5 of the California Health and Safety Code, if human remains are encountered by project personnel, the County Coroner shall be notified within 24 hours of the discovery. No further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains shall occur until the County Coroner has determined, within 2 working days of notification of the discovery, the appropriate treatment and disposition of the human remains. If the County Coroner determines that the remains are, or are believed to be, Native American, he or she shall notify the Native American Heritage Commission (NAHC) in Sacramento within 48 hours. In accordance with California Public Resources Code Section 5097.98, the NAHC must immediately notify those persons it believes to be the most likely descendent (MLD) of the deceased Native American. The MLD shall complete their inspection within 48 hours of being granted access to the site. The designated Native American representative shall then determine, in consultation with the property owner, disposition for the human remains.

3.4.6 Level of Significance After Mitigation

Impact 3.4-1: Implementation of mitigation measures MM-3.4-1a: Historic Preservation Plan and Protective Measures; MM-3.4-1b: Historic Resource Baseline Condition Study; and MM-3.4-1c: Compliance with the Secretary of the Interior's Standards for the Treatment of Historic Properties and Preserve the Character-Defining Features of Historic Resources would reduce Impact 3.4-1 to a **less-than-significant** level.

Impact 3.4-2: Implementation of MM-3.4-2a: Historic American Buildings Survey Documentation and MM-3.4-2b: Permanent Interpretive Exhibits would reduce Impact 3.4-2, but not to a **less-than-significant** level. Thus, the impacts would remain **significant and unavoidable**.

Impacts 3.4-3 and 3.4-4: Implementation of MM-3.4-3 would reduce Impacts 3.4-3 and 3.4-4 to **less-than-significant** levels.

Impact 3.4-5: Implementation of MM-3.4-4 would reduce Impact 3.4-5 to a **less-than-significant** level.

Impacts 3.4-6 and 3.4-7: Implementation of MM-3.4-5 would reduce Impacts 3.4-6 and 3.4-7 to **less-than-significant** levels.

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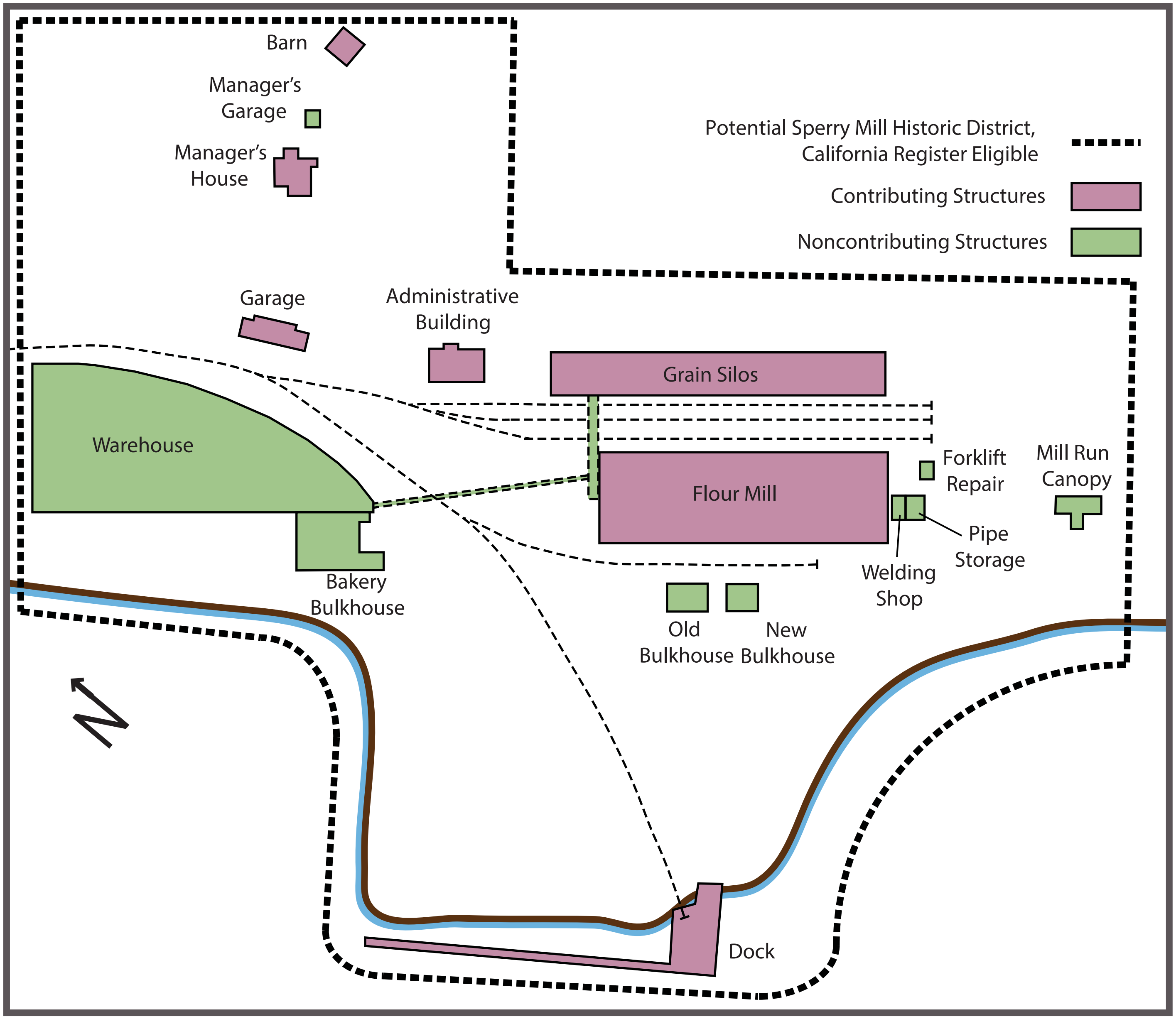

SOURCE: Carey & Co Inc. Architecture

FIGURE 3.4-1

Historical Resources Survey Map

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VALLEJO MARINE TERMINAL AND ORCEM PROJECT DRAFT EIR

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3.5 GEOLOGY AND SOILS

This section analyzes the potential impacts of the Vallejo Marine Terminal (VMT) and Orcem project (proposed project) with respect to geology and soils and recommends mitigation measures where necessary to reduce or avoid significant impacts. The primary information sources used to support this analysis include geologic and soils data and geotechnical analyses in association with past remediation activities and former project proposals. These include:

- **Appendix H-1**: Treadwell and Rollo. 2013. *Geotechnical and Environmental Consultation, GGBS Manufacturing Facility, Vallejo, California*. Prepared for Eocem Materials. Prepared by Treadwell and Rollo. February 20, 2013.
- **Appendix H-2**: ENGEO Inc. 2008. Preliminary Geotechnical Exploration, Proposed Residential Development, General Mills Property, 790 Derr Street, Vallejo, California. Submitted to Cherokee Brooks Street LLC. Prepared by ENGEO Inc. Project No. 7599.200.201. June 2008.

Treadwell and Rollo performed a review of past geologic and remedial action reports, evaluated their adequacy, and provided additional assessment of the Orcem Site's seismic hazards and slope stability. ENGEO Inc. performed a preliminary geotechnical evaluation of a former project proposed on the site, which is relied upon in this section as a source of baseline geologic information. Additional information sources used in this section include publicly available geologic maps, soil surveys, and fault information provided by the U.S. Department of Agriculture (USDA), the United States Geological Survey (USGS), and the California Department of Conservation (CDC). All figures referenced in this section are provided at the end of the section.

3.5.1 Regulatory Setting

Federal

Occupational Safety and Health Administration Regulations

Excavation and trenching are among the most hazardous construction operations. The Occupational Safety and Health Administration's (OSHA) Excavation and Trenching standard, Title 29 of the Code of Federal Regulations (CFR), Part 1926.650, covers requirements for excavation and trenching operations. OSHA requires that all excavations in which employees could potentially be exposed to cave-ins be protected by sloping or benching the sides of the excavation, supporting the sides of the excavation, or placing a shield between the side of the excavation and the work area.

State

The statewide minimum public safety standard for mitigation of earthquake hazards (as established through the California Building Code (CBC), Alquist–Priolo Earthquake Fault Zoning Act, and the Seismic Hazards Mapping Act) is that the minimum level of mitigation for a project should reduce the risk of ground failure during an earthquake to a level that does not cause the collapse of buildings for human occupancy, but in most cases, is not required to prevent or avoid the ground failure itself. It is not feasible to design all structures to completely avoid damage in worst-case earthquake scenarios. Accordingly, regulatory agencies have generally defined an "acceptable level" of risk as that which provides reasonable protection of the public safety, although it does not necessarily ensure continued structural integrity and functionality of a project (California Code of Regulations (CCR) Title 14, Section 3721(a)). Nothing in these acts, however, precludes lead agencies from enacting more stringent requirements, requiring a higher level of performance, or applying these requirements to developments other than those that meet the acts' definitions of "project."

Alquist–Priolo Earthquake Fault Zoning Act

The Alquist–Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. In accordance with this act, the State Geologist established regulatory zones, called "earthquake fault zones," around the surface traces of active faults and has published maps showing these zones. Earthquake fault zones are designated by the California Geological Survey (CGS) and are delineated along traces of faults where mapping demonstrates surface fault rupture has occurred within the past 11,000 years. Construction within these zones cannot be permitted until a geologic investigation has been conducted to prove that a building planned for human occupancy will not be constructed across an active fault (CGS 2002). These types of site evaluations address the precise location and recency of rupture along traces of the faults and are typically based on observations made in trenches excavated across fault traces.

The proposed project is not within an Alquist-Priolo Earthquake Fault Zone and therefore is not subject to the requirements of this act.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act of 1990 (Public Resources Code, Chapter 7.8, Section 2690–2699.6) directs the California Department of Conservation to protect the public from earthquake-induced liquefaction and landslide hazards (note that these hazards are distinct from fault surface rupture hazard regulated by the Alquist–Priolo Special Studies Zone Act of 1972). This act requires the State Geologist to delineate various seismic hazard zones, and requires cities, counties, and other local permitting agencies to regulate certain development projects within these zones (i.e., zones of required investigation). Before a development permit may be granted for a site within a Seismic Hazard Zone, a geotechnical investigation of the site must be conducted and appropriate mitigation measures incorporated into the project design. Evaluation and mitigation of potential risks from seismic hazards within zones of required investigation must be conducted in accordance with the CGS, Special Publication 117A, adopted March 13, 1997 by the State Mining and Geology Board as updated in 2008.

To date, Seismic Hazard Zone Maps have been prepared for portions of Southern California and the San Francisco Bay Area; however, no seismic hazard zones have yet been delineated for the project area (i.e., the Benicia USGS 7.5' Quadrangle). As a result, the provisions of the Seismic Hazards Mapping Act would not apply to the project.

California Building Code

The CBC has been codified in the CCR as Title 24, Part 2. Title 24 is administered by the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under state law, all building standards must be centralized in Title 24 or they are not enforceable. The purpose of the CBC is to establish minimum standards to safeguard the public health, safety, and general welfare through structural strength, means of egress facilities, and general stability by regulating and controlling the design, construction, quality of materials, use and occupancy, location, and maintenance of all building and structures within its jurisdiction. The 2010 edition of the CBC is based on the 2009 International Building Code published by the International Code Conference. The 2010 CBC contains California amendments based on the American Society of Civil Engineers Minimum Design Standards 7-05, which provides requirements for general structural design and includes means for determining earthquake loads as well as other loads (such as wind loads) for inclusion into building codes. The provisions of the CBC apply to the construction, alteration, movement, replacement, and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures throughout California. The proposed project would involve the demolition, removal and/or off-site transport of existing structures, including an equipment maintenance facility, office spaces, conveyors, crushers, screens, wash plants, scales, and other miscellaneous structures.

Local

Vallejo Municipal Code – Building Code

Chapter 12.04 of the Vallejo Municipal Code (Ordinance No. 1689 N.C.(2d), section 2(12.04.040), 11-12-2013) fully adopts the CBC by reference, with local amendments.

Vallejo Municipal Code – Excavation, Grading, and Filling

Chapter 12.40 of the Vallejo Municipal Code (Ordinance 400 N.C.(2d) section 1 (part), 1977) establishes rules and regulations for excavation, grading, and filling activities intended to preserve and enhance the natural beauty of the land, streams, and shorelines, and to reduce or eliminate the hazards of earthslides, mud flows, rock falls, undue settlement, erosion, siltation, and flooding. To obtain a grading permit, plans and specifications prepared by a licensed engineer must be submitted to the city engineer/director of public works for review and approval. Plans and specification, among many things, must show:

- A vicinity sketch or other data adequately indicating the site location;
- Property lines of the property on which the work is to be performed;
- Location of any buildings or structures within 50 feet of the proposed work;
- Accurate contours showing the topography of the existing ground;
- Elevations, dimensions, location, extent, and the slopes of all proposed grading, working slopes; and
- Details of all drainage devices, walls, or other protective devices to be constructed in connection with, or as a part of, the proposed work.

In addition, the application must also contain the following:

- Erosion control methods and details, including schedule for installation. Erosion control plans for large-scale projects (50 acres or 200 lots, whichever is less) shall be prepared by a hydrologist specializing in erosion control.
- A map showing the drainage area and estimated runoff of the work and adjacent areas.
- A soils investigation report, including data regarding the nature, distribution and strength of existing soils, conclusions, and recommendations for grading procedures and design criteria.
- A geological report, including an adequate description of the geology of the site and conclusions and recommendations regarding the effect of geologic conditions on the proposed work.

No permit shall be granted until all of the required data has been submitted for the application, the city engineer/director of public works has approved the plans, and all required fees have been paid.

Vallejo Municipal Code – Seismic Hazard Identification and Mitigation Program for Unreinforced Masonry Buildings

Chapter 12.07 of the Vallejo Municipal Code (Ord. 1601 N.C.(2d) Section 5.01, 2007: Ord. 1075 N.C.(2d) Section 1 (part), 1990) requires owners of unreinforced masonry buildings to investigate and correct the potential seismic hazards of their buildings. The URM program requires owners of URM buildings to have an engineering report submitted to the city's building division, to determine the existence, nature, extent and severity of structural deficiencies in their buildings' capacities for earthquake resistance which could result in damage or collapse with possible injury or loss of life. The engineering report must describe areas found by analysis to be deficient in their ability to withstand prescribed seismic forces, discuss in general terms the alternatives available for mitigation of these inadequacies, and the engineer's recommendations for most suitable solutions.

The ordinance includes options for hazard mitigation such as abandoning the building, retrofitting the building, changing the use of the building to an exempted building class, among others. The ordinance also specifies timeframes that hazard reduction actions must be accomplished following the issuance of the engineering report. The City's Building official must review and approve engineering reports and proposed hazard reduction strategy.

Due to the age and nature of certain buildings on the project site, including qualifying historic buildings 9 (Administrative Building) and 10 (Garage), the URM building program may apply, depending on future occupancy. These buildings were previously renovated by the former owner, Cherokee Brooks, and used as administrative offices.

General Plan

The City of Vallejo has three overarching goals related to geology, soils, and seismicity, as detailed in the Vallejo General Plan (City of Vallejo 1999).

The seismic hazards goal is to protect life, property, and public well-being from seismic, floodplain, and other environmental hazards, and to reduce or avoid adverse economic, social, and physical impacts caused by existing environmental conditions (City of Vallejo 1999). Policies developed to achieve this goal that are or may be relevant to the proposed project are:

- Adopt, maintain, review (wherever necessary), and enforce adequate standards and criteria to reduce or avoid all levels of seismic or other geologic risk, whether it be unacceptable, tolerated or avoidable risk.
- Existing and prospective property owners should be made aware of the potential hazards and their implications.

- Seismic Shaking:
    - A systematic survey should be conducted to identify those older structures most vulnerable to earthquake damage.
    - There should be continued compliance with Chapter 1207, Seismic Hazard Identification and Mitigation Program for Unreinforced Masonry Buildings, of the Vallejo Municipal Code.
    - At the discretion of the Building Official, certain of the more important or critical use structures in Groups I, II, and III (such as hospitals, schools, high rise buildings and fire stations, etc.) should be specified as requiring more conservative seismic design parameters utilizing the maximum credible earthquake). Other less important uses in Groups I, II and III (such as certain utilities, roads, and small isolated dams) could be designed utilizing the maximum probable earthquake, as are the ordinary types of construction in Groups IV and V.

The slope instability goal is to protect life, property, and public well-being from seismic, floodplain, and other environmental hazards, and to reduce or avoid adverse economic, social, and physical impacts caused by environmental conditions (City of Vallejo 1999). Policies developed to achieve this goal that are or may be relevant to the proposed project are:

- Require special engineering studies in areas of known slope instability.
- Avoid development on known unstable slopes where engineering design cannot ensure safe living conditions.
- Identify and appropriately zone areas of unstable soils and/or geologic formations in areas identified as having slopes of over 20%, and regulate density and siting in accordance with the natural carrying capacity of the land.

The soil-related problems goal is to protect life, property, and public well-being from seismic, floodplain, and other environmental hazards, and to reduce or avoid adverse economic, social, and physical impacts caused by environmental conditions. Policies developed to achieve this goal that are or may be relevant to the proposed project are:

- Special engineering studies should be required for areas underlain by un-engineered fill.
- Special foundation design, including pile foundations, may be required in the area underlain by bay mud.
- Soil studies required for new development should include a discussion of and methods for reducing groundwater hazards.

3.5.2 Existing Conditions

Physiography and Topography

The proposed project is located in the northern portion of the East Bay Hills, east of San Pablo Bay and the Mare Island Strait. The East Bay Hills lie within the region of coastal California referred to by geologists as the Coast Ranges geomorphic province. The Coast Ranges have experienced a complex geological history characterized by Late Tertiary folding and faulting that has resulted in a series of northwest-trending mountain ranges and intervening valleys (CGS 2002). The San Francisco Bay Valley and enclosing peripheral hills, in association with the two main fault structures (the San Andreas and Hayward–Rodgers Creek faults), comprise the main geological features of the local Bay Area. Diverse crustal movements within this tectonic framework are responsible for the morphology and seismicity of the area.

The project site is located on the shore of the Mare Island Strait, with the bulk of the developed areas located on flat land slightly above the high tide line that is mostly comprised of artificial fills. On the landward edge of the site to the northeast, a steep slope trends from northwest to southeast. Slopes along the hillside locally exceed 50%, with elevations on site varying from sea level to about 140 feet above mean sea level. Figure 3.5-1 includes topographic contours and two elevation profiles that were analyzed for slope stability (discussed below). Areas of steep slopes occur adjacent to the eastern side of the Orcem Site and on the eastern sides of the northern and southern ends of the VMT Site boundary.

Geology and Soils

The available data indicates the eastern portion of the site is blanketed by a few feet of soil, which is underlain by Cretaceous Great Valley Sequence bedrock consisting of moderately to well-cemented, strong to friable, thinly bedded sandstone, with friable, thinly bedded siltstone and claystone interbeds (Appendix H-1). The western portion of the site appears to be blanketed by clayey fill. The fill is either underlain directly by bedrock or soft clay locally referred to as Bay Mud, which overlies bedrock. The project area has been mapped by various authors as underlain by Holocene artificial fill in the west and Late Cretaceous undivided sandstone, siltstone, and shale of the Great Valley Complex in the east (Appendices H-2 and H-3). Dibblee (2005) maps the eastern upland portion of the site as Panoche formation consisting of micaceous shale with minor thin sandstone beds (Kp) and arkosic sandstone (Kps).

Each of the geologic units present on site are further described below and shown in Figure 3.5-1:

- ***Artificial fills:*** These deposits typically consist of undocumented “man-made” fills that may have been derived from material generated from cutting of the adjacent rock slope placed in connection with existing site improvements, and possibly from off-site sources.

These existing fills generally consist of intermixed loose to dense silty and gravelly sands, silty clays, and rock fragments with occasional intermixed construction rubble and debris (i.e., brick, wood, metal, and concrete fragments, etc.). The rock fragments vary in size from cobbles to boulders, likely derived from excavations generated in the surrounding slopes to the east. According to the ERRG (2007) reports, some debris and rubble was encountered during their excavation work at the site in connection with environmental remediation work. Existing fills range from about 3 to 19 feet thick, thickening towards the western portion of the site (i.e., the Mare Island Strait).

- ***Alluvial Soils and Bay Mud Deposits:*** The western lower-lying areas of the site appear to be underlain by natural soft, highly compressible alluvial soils and "bay mud" deposits, presumed to be beneath the layer of artificial fill that make up the flat-lying portions of the site. Bay Mud deposits are highly compressible and may be susceptible to significant settlement when subjected to additional loading, either through the placement of additional fill and/or additional structural loads. In addition, these deposits have low strength characteristics and may be problematic when excavated due to their instability in temporary cuts and slopes. As shown in Figure 3.5-1, these deposits are thought to be about 10 feet thick, pinching out to zero down the center of the site. Underlying or interfingered with the Bay Mud deposits are medium stiff to stiff alluvial deposits of silts and clays.
- ***Colluvial Deposits***: Colluvium is an accumulation of soil that has been deposited primarily by erosion and slope wash. Areas of thicker soil cover in swales on the eastern portion of the site are interpreted to be colluvium, and have been found to be up to 12 feet thick. Colluvium consists of dark brown or dark gray, soft to stiff, silty clay and sandy clay with varying moisture content. Samples of the colluvium have been tested as having a plastic index of 37, which indicates the material is highly expansive (Appendix H-2).
- ***Bedrock:*** Bedrock encountered at the site mainly consists of interbedded sandstone, siltstone, and claystone of the Cretaceous Great Valley Sequence. In general, the sandstone is moderately to well cemented, moderately strong to friable, thinly bedded, light yellowish brown where weathered, and gray to dark gray where fresh. Siltstone is generally light gray to dark gray, friable, and thin bedded to laminate. Claystone is generally dark gray to yellowish brown, friable, preferentially sheared and thinly bedded. The sedimentary layers are oriented in a manner that is favorable from a slope-stability perspective (i.e., the rock layers are inclined into the slope rather than along it) (Appendix H-1).

Overlying the geologic units described above is a mantle of soil that varies in thickness and character. In general, soil characteristics are strongly governed by slope, relief, climate, vegetation, and the geologic unit upon which they form. Soil types are important in describing engineering constraints such as susceptibility to soil erosion (from both water and wind), corrosion risks, and various behaviors that affect structures, such as expansion and settlement.

The type, aerial extent, and some key physical and hydrological characteristics of soils within project area were identified based on a review of a soil survey of Solano County completed by the USDA Natural Resources Conservation Service (USDA 2014). Soil units are described in Table 3.5-1. The Dibble–Los Osos clay loam is generally coincident with the area of the project underlain by bedrock, whereas the "made land" corresponds to the area of the site underlain by artificial fills. Physical characteristics of "made land" are not included because it can vary substantially based on their origin and manner of placement.

Table 3.5-1
Soil Types in the Proposed Project Area

Soil Unit	Acres / Percent of Project Area	Shrink/Swell Potential	Corrosion Risk[1]		Erosion and Runoff	
			Uncoated Steel	*Concrete*	*Hydrologic Soil Group*[2]	*Erosion Factor (Kf)*[3]
Dibble–Los Osos clay loam, 9% to 30% slopes	5.8 (13%)	Moderate - High	Moderate-High	Low	D	0.28-0.37
Dibble–Los Osos clay loam, 30% to 50% slopes	21.2 (47%)	Moderate - High	High	Low	D	0.28-0.37
Made Land	9.2 (21%)	—	—	—	—	—
Water	8.7 (19%)	—	—	—	—	—

Source: USDA 2014.

Notes:

[1] "Risk of corrosion" pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete.

[2] Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups (A through D) according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms. Soils in Group B have a moderate infiltration rate and a moderate rate of water transmission. Soils in Group C have a slow infiltration and transmission rates and consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. Soils in Group D have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

[3] Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Regional Faulting and Seismic Hazards

Fault Rupture: The proposed project is not located in a State of California Earthquake Hazard Fault Zone (California Department of Conservation 2014a). Furthermore, according to review of other faults not mapped under the Alquist–Priolo Earthquake Fault Zoning Act and a field reconnaissance in 2008 did not observe geology or geomorphic features indicative of faulting at the site. Based on these findings, the potential for ground rupture at the site is low.

Ground Shaking: The major active faults in the area are the Hayward, Calaveras, San Andreas, Concord–Green Valley, and San Gregorio Faults. The project site could be subject to significant ground shaking from a major earthquake along any of these faults or along many other active and potentially active faults in the region. A magnitude 6.0 earthquake along the West Napa Fault on August 24, 2014, caused strong to very strong ground shaking in the Napa region with significant damage, though it is estimated to have caused moderate ground shaking at the project site, with little to no observable damage (USGS 2014). The portion of the fault that ruptured in that quake was not previously known to be Holocene-active, nor was it zoned under the Alquist–Priolo Earthquake Fault Zoning Act.

The primary tool that seismologists use to describe future ground-shaking hazards is a probabilistic seismic hazard assessment (PSHA). The PSHA for the State of California takes into consideration the range of possible earthquake sources and estimates their characteristic magnitudes to generate a probability map for ground shaking. The PSHA maps depict values of peak ground acceleration (PGA)[1] based on various return periods and are useful because they incorporate all known sources of seismicity. For example, based on the PSHA, the project site is expected to have a 10% probability of exceeding a PGA of 0.48g and a 2% probability of exceeding a PGA of 0.72g in the next 50 years (California Department of Conservation 2014b). A 2% probability of exceedance in 50 years is about the same as a 2,500-year average repeat time. In past earthquakes, average peak accelerations in between 0.44g and 0.83g have been correlative to severe to violent perceived ground-shaking intensities and moderate to heavy structural damage (USGS 2014).

Liquefaction: Even though the project site is located close to the bay and likely has a shallow groundwater table, the potential for liquefaction is expected to be low based on site-specific boring and test log data (Appendix H-1).

Lateral Spreading: The proposed development is along the Mare Island Strait and the ground slopes down towards the center of the channel. However, because there does not appear to be a continuous layer of potentially liquefiable soil, the potential for lateral spreading is expected to be low (Appendix H-1).

Slope Stability

A slope failure is a mass of rock, soil, and debris displaced down a slope under the influence of gravity by sliding, flowing, or falling. Several factors can affect the susceptibility of a slope to failure, including (1) steepness of the slope; (2) strength and bulk density of the soil or bedrock; (3) width, orientation, and pervasiveness of bedrock fractures, faults, or bedding planes; (4) prevailing groundwater conditions; and (5) type and distribution of vegetation. Those features, among others, are important factors that determine the predisposition of a sloped surface to fail, while external processes such as exceptionally heavy rainfall, earthquakes, or human disturbances (e.g., quarrying, road cuts, and large-scale vegetation removal) may trigger a new or

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[1] The PGA for a given component of motion is the largest value of horizontal acceleration obtained from a seismograph. PGA is expressed as a percentage of the constant value of acceleration due to gravity (g) (approximately 980 centimeters per second squared).

reactivate an existing slope failure. Review of publicly available landslide maps do not reveal any known landslides in or adjacent to the project site, but that the slopes above the Orcem Site are "generally susceptible" to landslides and "marginally susceptible" to earth flows (USGS 1974, Bortugno 1986).

The degree to which a slope will remain stable is expressed by the "factor of safety" (FOS), which is calculated by dividing the forces that resist movement (the shearing strength available along a potential slide surface) by the shearing stresses that tend to produce failure along a surface. When a calculated FOS value is less than 1, conditions that make a slope susceptible to failure have exceeded those that tend to hold it in place. Treadwell and Rollo (2013) used the engineering properties of fill, colluvium, and bedrock collected from past investigations of the site to analyze the failure potential along two cross sections (shown in Figure 3.5-1). The location and length of the cross sections were selected based on a determination of the "critical" failure surface, which is determined by using a computer program to model hundreds of iterations to search for the terrain surface in the study area that results in the lowest FOS. Calculations of the FOS based on the critical failure surface ensure that the analysis results are representative of the worst-case scenario.

The results of the slope stability analysis conducted by Treadwell and Rollo (2013) are presented in Table 3.5-2. The static factors of safety for the existing slopes vary from about 1.2 to 2.1. Under a design earthquake scenario (referred to as pseudo-static), the pseudo-static factor of safety for the existing slope decreases to values ranging from 0.8 to 1.2. Typically, a slope with a static factor of safety of at least 1.5, and a pseudo-static factor of safety of at least 1.15 is considered stable (Seed 1979, as cited in Appendix H-1). Thus, the critical failure surface along cross section A-A' would be considered generally stable under normal conditions (i.e., the value exceeds 1, but is below 1.5), but susceptible to failure in a large earthquake. However, the magnitude of anticipated slope movement was estimated to be small, about 4 to 5 inches. Cross section B-B' was found to be stable under both normal and seismic conditions.

Table 3.5-2
Slope Stability and Seismic Slope Displacements

Profile	Static Factor of Safety	Pseudo-Static Factor of Safety	Yield Acceleration (g)	Seismic Slope Displacement during Design Earthquake
A-A'	1.194	0.813	0.118	About 4 to 5 inches
B-B'	2.055	1.227	—	Negligible

Source: Appendix H-1, Appendix H-2.

The analysis of slope failure above is specific to large-scale, deep-seated failures of large portions of the hillside. However, rockfalls, whereby individual rocks or boulders fall, tumble, or roll down the slope, represent another kind of slope failure mechanisms that could occur on the slope. Treadwell and Rollo (2013; see Appendix H-1) used a different methodology—which takes into consideration slope angles, slope lengths, and surface roughness, as well as the size and shape of rocks that could be dislodged—to model how fast, how far, and with how much bounce blocks and boulders could travel down-slope. The model found that as many as 94% of the rockfalls (should any occur) would resume rolling past the base of the slope, and calculated that the kinetic energy for a 1 cubic foot rock could be about 4,950 foot-pounds by the time it reached the base of the slope (Appendix H-1).

3.5.3 Thresholds of Significance

The following criteria, included in Appendix G of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.), will be used to determine the significance of potential geology and soils impacts. Impacts to geology and soils would be significant if the proposed project would:

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; or
   iv) Landslides.

B) Result in substantial soil erosion or the loss of topsoil;

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

D) Be located on expansive soil, as defined in Table18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property.

This analysis assumes that construction and design of proposed facilities would utilize standard site-preparation practices, engineering designs, and seismic safety techniques that are required under the CBC and local amendments (see Section 3.5.1). This analysis also assumes that the preliminary geotechnical design recommendations developed by Treadwell and Rollo (2013), refined as necessary according to final designs, would be implemented as part of the proposed project and incorporated into final project designs.

The following CEQA criteria topics are not discussed further in this EIR section, either because the issue is not applicable to the project, because there would be no impact, or because the issue is addressed in another section of the EIR.

Would the project expose people or structures to potential substantial adverse effects, including risk of loss, injury, or death involving 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?

No faults zoned under the Alquist–Priolo Earthquake Fault Zoning Act, or any other Holocene-active faults pass through the project site (Appendix H-1). Thus, there would be no impact with respect to fault rupture on the site.

Would the project result in substantial soil erosion or the loss of topsoil?

The potential for soil erosion and loss of topsoil is comprehensively addressed in Section 3.8, Hydrology and Water Quality, which analyzes and mitigates for the adverse effects runoff and/or facility discharges with respect to erosion and sedimentation. This CEQA criterion is therefore not further discussed in this section.

3.5.4 Impact Discussion

A) Would the project expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

i. Strong seismic ground shaking?

ii. Seismic-related ground failure, including liquefaction?

iii. Landslides?

VMT and Orcem Project Analysis

Ground shaking is an unavoidable hazard for nearly all man-made facilities in the Bay Area. The general setting means proposed facilities are likely to experience ground shaking from at least one major earthquake (e.g., greater than moment magnitude 6.7) sometime during the operational life of the project. Based on the most recent PSHA for the State of California, the project site would have an approximately 10% chance of exceeding a PGA of 0.48g and a 2% chance of exceeding a PGA of 0.72g in the next 50 years. The project site is also underlain by soils that if not properly engineered during construction site preparation, could be subject to secondary effects such as seismically induced settlement. As discussed in the setting, soils underlying the project site are not anticipated to be subject to liquefaction or lateral spreading due to the soil characteristics that were observed in borings. Proposed structures, including berths, conveyors, administrative office buildings, guardhouse, out load silos and weighbridges, mill and filter buildings, accessory structures, as well as surface and buried infrastructure, could be subject to damage from earthquakes and earthquake-induced ground failures.

The proposed project does not involve any activities that would expose the general public or off-site properties to greater level of risk from geologic and/or seismic hazards compared to existing conditions. A security fence and entrance kiosk would limit public access to the facility, and ample buffer space exists between proposed facilities and the nearest properties such that residential areas or public spaces would be unaffected by toppling equipment or falling debris (however unlikely on a properly designed site). The project would not make any destabilizing excavations into the hillsides to the east—on the contrary, the project would carry out slope repairs as necessary and install a retaining wall along the base of the hillside such that soils would be buttressed and seismically induced slope movements minimized or avoided. Note that potential effects of the project on slope stability are addressed in the following criterion.

For the aforementioned reasons, the consequences of earthquake-related damage the facility might incur would be limited to the facility itself and its on-site workers. Based on the definitions in Section 12.07.030 of the City's municipal code, none of the existing or proposed buildings on site would be categorized as an "essential building" (i.e., a hospital or medical building, fire or police station, or municipal government disaster operation and communication center), or a high-risk building (i.e., any building with an occupant load of 100 persons or more). There are several buildings on site that—based on the definition in Section 12.07.030D of the City's municipal code—may be classified as an unreinforced masonry building (URM), if they contain "walls and/or columns constructed wholly or partially of masonry without at least fifty percent of the reinforcement required by the most current edition of the California Existing Building Code adopted by the city." Buildings 9 and 10 were occupied with offices used by the previous owner, and would again initially be occupied during VMT Phase 1 for the purpose of administrative and operational support, and possibly leased thereafter for a variety of complementary terminal operations, warehousing, office, and general manufacturing uses. These buildings are described as reinforced concrete structures, but may have unreinforced brick infill "spandrel panel" that are not part of the structural system. The City's URM ordinance would require an engineering report prior to occupancy to evaluate the structural integrity and recommend options to reduce the hazard of failure during an earthquake. If necessary, the applicant would undertake repairs and reinforcements necessary to allow the occupancy of the buildings, per Section 12.07 of the City's municipal code.

The Orcem project component is expected to provide for up to 40 full-time jobs, and the VMT project component is expected to have a maximum of 40 workers on site at any one time (though the permanent workforce is expected to consist of about 25 employees). This means there would normally be about 65 employees on site during working hours, with up to 85 employees during busy shipping and freight operations. The workforce would have various functions (cargo loading, maintenance responsibilities, plant operations, administrative and sales functions, etc.), and would be in scattered locations in various buildings and loading areas across the site. Based on this information, most if not all (with the possible exception of administrative offices) of the buildings on site, due to required compliance with modern building codes, would be classified as low risk buildings per Section 12.07.030 of the City's municipal code.

The project would minimize exposure of on-site workers and proposed facilities to earthquake-related damage through proper design and construction in accordance with the provisions of the 2010 CBC, and sections of the Vallejo Municipal Code dealing with construction, grading, and excavation (see Section 3.5.1). According to the geotechnical review completed by Treadwell and Rollo (Appendix H-1), it is expected that most buildings on the eastern side of the site (where bedrock is shallower than 5 feet below grade) can be adequately supported with spread-foot or mat foundations, whereas structures on the western portion of the site (where bedrock is deeper than 5 feet below grade) will require drilled piers or auger-cast piles driven deeply enough to provide the necessary bearing capacity. The mill will require a massive concrete foundation to dampen vibrations and support anticipated loads, and preliminary information suggests the foundation will be able to reach bedrock (Appendix H-1). Specific parameters for seismic design, based on anticipated ground motions are also provided in Appendix H-2.

Geologic studies, evaluations, and/or geotechnical reports necessary to demonstrate the proposed project has properly assessed and mitigated for seismic hazards are mandated as a condition of grading and/or building permits, which the applicants and/or their contractors would need to obtain from Vallejo Building Division prior to start of construction. The purpose of these local permits is to ensure the proposed development complies with all relevant building codes (i.e., CBC and local amendments), local ordinance codes, and local and state geologic hazard regulations. As indicated in Section 3.5.1, Chapter 12.40 of the Vallejo Municipal Code, applicants must prepare and submit to the city engineer/director of public works final grading plans, including geotechnical and soils reports prepared by appropriately licensed individuals (Professional Geologist (PG), Certified Engineering Geologist (CEG), or Professional Engineer (PE)), for review and approval prior to project approval.

Given the proposed facilities would be closed to the general public and would not affect off-site properties, and given the facilities would be constructed in accordance with the CBC and geotechnical design recommendations, the impact of the project with respect to earthquakes would be **less than significant**.

Off-Site Improvements

The proposed project includes two off-site improvements (public access improvements and removal of existing deteriorated docks) that would take place at the City of Vallejo Municipal Marina located approximately 2 miles north of the project site. The public access improvements would involve installation of a new self-propelled personal watercraft launch ramp just north of the access ramp to K Dock at the south end of the marina. The proposed launch would consist of a pre-cast articulated concrete mat, approximately 10 feet wide by 60 feet long over a geotextile fabric. As described previously, seismic ground shaking is an unavoidable hazard for nearly all man-made facilities in the Bay Area, and seismic-related ground failure and landslides are also a possibility in areas with susceptibility to these hazards. Although the launch ramp would provide a public facility that could be susceptible to seismic-related hazards, this pre-cast articulated concrete mat would be designed to withstand seismic shaking and would not include any features that would pose potential hazards to the public in the event of a seismic event. The project would also involve the removal of existing deteriorated dock improvements within the water area at the north end of the marina. Removal of the deteriorated docks would eliminate the potential for exposure of people and structures to seismic hazards since the docks would no longer be in the water. Since the off-site improvements would not expose people or structures to substantial adverse effects due to seismic hazards, impacts would be **less than significant**.

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

VMT and Orcem Project Analysis

As discussed in the setting, there are steep slopes along the northeast side of the Orcem Site as well as the northern and southern ends of the VMT Site. According to the geotechnical review of the project site, these slopes are stable under normal conditions, and generally stable in a design earthquake, with movements of 4 to 5 inches expected along the most critical slope profile (i.e., assuming no retaining wall is present) (Appendix H-1). The proposed project does not involve cuts into the hillside that could remove buttressing soils or otherwise destabilize the slope. Therefore, the project does not make slope failures more likely or affect landslide hazards for off-site properties. However, planned facilities and use of the site for active industrial operations may put site workers and facilities at risk slope failure or rockfall if improperly designed.

The Orcem component of the project would place a 3-meter-high retaining wall along the base of the slope, generally along the northern and eastern sides of the planned material storage areas. Should a slope failure or rockfall occur, the retaining wall would serve to protect the facility, and the location of the raw material storage lots on the other side of the retaining walls essentially provides ample buffer space which reduces the chances of occupied buildings being affected by slope movements. Proposed facilities on the VMT Site would generally be sufficiently distant from the base of the steep slopes to be affected by potential slope instabilities. One exception is on the southwestern tip of the project site, where an operation equipment staging and maintenance shed is proposed. In this location a low retaining wall would be constructed.

Construction Impacts

Deep excavations for the mill foundation and other buildings founded on bedrock could encounter weak or saturated soils, or bay mud deposits that would be subject to sloughing or slumping such that either sloped excavations or retaining walls would be required to protect worker safety (Appendix H-1). The exact location and methods for construction-related slope protection, whether it be installing temporary retaining walls or sloping excavations to maintain adequate stability, would be specified in final construction plans in accordance with the required geotechnical investigations of the site. As discussed above under Criterion A), such plans would be prepared by appropriately licensed individuals and submitted to the City for review and approval prior to the start of construction.

Furthermore, California Occupational Safety and Health Administration (CalOSHA) requirements for excavation safety require that trenches and excavations that pose a risk to site workers be sloped or shored, and be approved and monitored by a CalOSHA approved “competent person.” The CalOSHA competent person would make changes and modifications to sloping and shoring requirements as soil and/or groundwater conditions change across the site. OSHA requirements are discussed in Section 3.5.1. Following construction, open trenches and excavated pits would be backfilled with engineered fill or replaced by properly designed foundations, minimizing the potential for future slope instabilities. Because construction-related excavations would be temporary in nature, and would be governed by CalOSHA-related safety requirements, construction-phase impacts of the project on slope stability would be **less than significant**.

Operational Impacts

Installation of the retaining wall, if properly designed, would protect site workers and operations from the potential effects of a slope failure and/or rockfalls. As discussed in the setting, slope failure is only expected in the event of a large earthquake, and even then, slope movements were estimated to be on the order of 4 or 5 inches. However, rockfalls may occur anytime due to occasional downslope tumbling of blocks or boulders that become dislodged in the process of weathering (e.g., root action, freeze/thaw, rainfall, etc.). Given the proposed project is industrial in nature, and that the site would include diesel storage tanks, refueling areas, and storage of other hazardous materials, the consequences to the site and surrounding environment of a landslide would be high.

Although project plans include provisions of retaining walls to protect the site, it is important that these be designed to be high enough and strong enough to buttress the hillside and to resist damage from rockfall impacts. For example, analysis by Treadwell and Rollo (2013) estimates falling rocks could have a maximum kinetic energy of 4,950 foot-pounds and a maximum bounce height of 8.5 feet by the time they reach the base of the slope. The retaining walls should include provisions for adequate drainage and should be founded below any potential failure planes. Although slope stability evaluations have already been prepared for the project and have concluded the risk of landslides is low, these conclusions are preliminary in nature. Proper design of remedial systems will require more detailed study as design of the project proceeds to final stages. Therefore, prior to mitigation, operational impacts would be **significant** (Impact 3.5-1).

Off-Site Improvements

The proposed project includes two off-site improvements that would take place at the City of Vallejo Municipal Marina located approximately 2 miles north of the project site as described earlier. The public access improvements would involve installation of a new self-propelled personal watercraft launch ramp just north of the access ramp to K Dock at the south end of the Marina. The proposed launch would consist of a pre-cast articulated concrete mat, approximately 10 feet wide by 60 feet long over a geotextile fabric. The project would also involve the removal of existing deteriorated dock improvements within the water area at the north end of the marina. The proposed off-site improvements would be located in the water area and would not increase the risk of landslide, lateral spreading, subsidence, liquefaction, or collapse. Impacts would be **less than significant**.

C) Would the project be located on expansive soil, as defined in Table18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

VMT and Orcem Project Analysis

Table 18-1-B of the Uniform Building Code defines the expansive potential of a soil by its "expansion index," which if greater than 20, typically requires special foundation design consideration under the Uniform Building Code (ICBO 1994). The expansive potential of soils is typically related to the type and amount of clay minerals in a soil, along with the moisture content of the soil and how often it changes (i.e., wet/dry cycles). Calculations of the expansion index require site-specific testing of soils. The USDA (2014), based on regional studies of representative soils, estimates the expansive potential of the Dibble–Los Osos clay loam (within upland portions of the site) to be moderate to high (see Table 3.5-1). This is consistent with site-specific testing completed by ENGEO (2008), which found the expansive potential of soils to be moderate to high (with expansion indices ranging from 17–37). The most expansive soils were found within colluvium, which does not underlie the footprint of the proposed facilities (see

Figure 3.5-1). Bay mud deposits, which are presumed to underlie the artificial fills on site, may also be expansive and would not be suitable for use as engineered fill.

The presence of expansive soils, however, would not generally represent a significant hazard to life or safety, and would be addressed through application of modern building codes and generally accepted professional engineering geologic principles and practice. ENGEO (2008) recommends typical measures to reduce the potential for expansive soils to have adverse effects on building foundations and utilities. This includes a combination of special rigid mats such as post-tensioned slabs or conventional reinforced mats, and special grading requirements such as overexcavation, moisture conditioning, and compaction within specified ranges.

As discussed under Criterion A), prior to the issuance of any grading or building permits, a design-level geotechnical study would be prepared by a registered civil or geotechnical engineer, and submitted for review and approval to the City of Vallejo. The design-level geotechnical study would include more detailed information based on final designs that identify soil conditions, recommend foundation designs, and provide recommendation to mitigate for expansive soils. The geotechnical study would be required to comply with applicable building codes and engineering standards, including any applicable amendments to the CBC contained in the City’s municipal code. The project structures would be designed to either avoid or accommodate without issues small-scale instabilities such as shrink/swell behavior, load-induced and long-term soil settlement, among other issues. For these reasons, the project impacts with respect to expansive soils would be **less than significant**.

Off-Site Improvements

The proposed project includes two off-site improvements that would take place at the City of Vallejo Municipal Marina located approximately 2 miles north of the project site as described earlier. The public access improvements would involve installation of a new self-propelled personal watercraft launch ramp just north of the access ramp to K Dock at the south end of the marina. The proposed launch would consist of a pre-cast articulated concrete mat, approximately 10 feet wide by 60 feet long over a geotextile fabric. The project would also involve the removal of existing deteriorated dock improvements within the water area at the north end of the marina. Although the off-site improvements could be located on expansive soils, the presence of expansive soils would not represent a significant hazard to life or safety in the context of the improvements, and would be addressed through application of generally accepted professional engineering geologic principles and practice. Therefore, impacts would be **less than significant**.

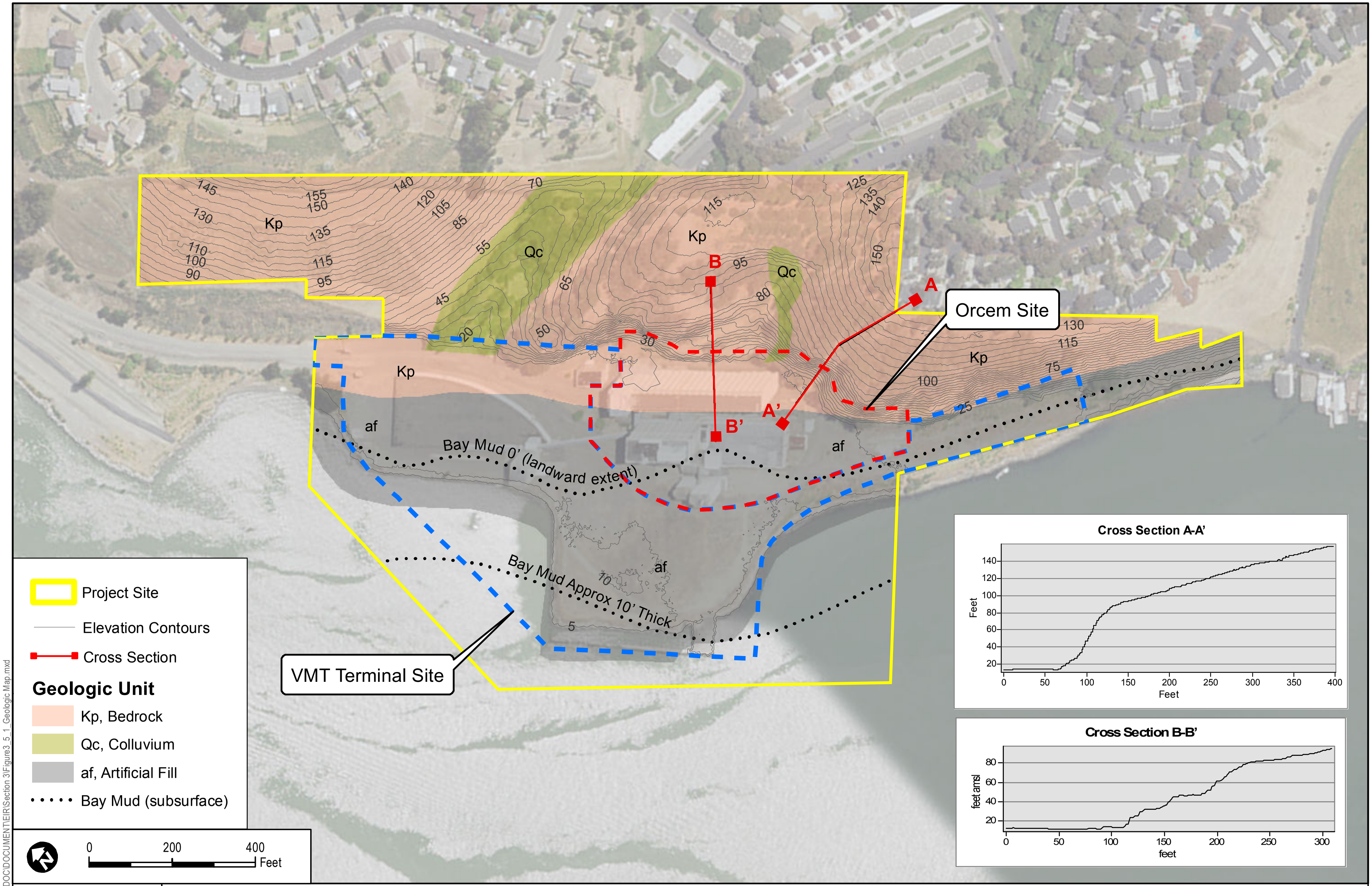
3.5.5 Mitigation Measures

Mitigation for Impact 3.5-1: Although project plans include provisions of retaining walls to protect the site, proper design of remedial systems would require more detailed study as design of the project proceeds to final stages. Therefore, impacts would be significant prior to mitigation.

MM-3.5-1 **Maintenance of Adequate Slope Stability**. Prior to approval of final project designs, the applicants shall: (a) Prepare and submit for review construction-level plans for the catchment and retaining wall to be placed at the toe of the slope on the Orcem Site; and (b) Prepare and submit for review construction-level plans and a supplemental soil engineering review to demonstrate that proposed final design slopes on the VMT Site (including riprap dikes) would maintain adequate factors of safety under both static and pseudo-static conditions. The supplemental investigation shall include additional exploratory borings, trenching, laboratory testing, and geologic analyses, as necessary, to ensure the analysis is based on the proper distribution and characteristics of earth materials, and adequately informs the final designs of proposed retaining walls and riprap dikes. The acceptable level of stability (i.e., seismic and static factor of safety (FOS) values) shall be determined by the geotechnical consultant in consultation with the City of Vallejo Building Division; but in no case shall be below a static FOS of 1.5 or a pseudo static FOS of 1.15. All slope stability evaluations shall be prepared and stamped by a registered geotechnical engineer or engineering geologist, and reviewed and approved by the City of Vallejo Building Division prior to approval of final building plans.

3.5.6 Level of Significance After Mitigation

Implementation of mitigation measure MM-3.5-1 (Maintenance of Adequate Slope Stability) would ensure that the retaining wall is properly engineered to protect the site from slope movements. With implementation of MM-3.5-1, exposure of proposed facilities and site workers to slope instabilities (include rockfall and landslide) would be eliminated or minimized to an acceptable level. Impact 3.5-1 would be reduced to **less than significant** with mitigation.



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8301

SOURCE: Engeo 2013, NCALM 2003

FIGURE 3.5-1

Site Geology and Topography

VALLEJO MARINE TERMINAL AND ORCEM PROJECT DRAFT EIR

Path: Z:\Projects\j830101\MAPDOC\DOCUMENT\EIR\Section 3\Figure3_5_1_Geologic Map.mxd

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3.6 GREENHOUSE GAS EMISSIONS

This section analyzes the potential impacts of the Vallejo Marine Terminal (VMT) and Orcem project (proposed project) with respect to greenhouse gas (GHG) emissions, and recommends mitigation measures where necessary to reduce or avoid significant impacts. Information provided in this section was derived from technical studies prepared for the proposed project, provided as the following appendices:

- **Appendix D-1:** Ramboll Environ. 2015. Orcem/VMT Project Air Quality and Greenhouse Gas Evaluation.
- **Appendix D-2:** Moffatt & Nichol. 2015. Technical Memorandum: Sea Level Rise Assessment.

3.6.1 Regulatory Setting

Federal

Massachusetts vs. EPA. On April 2, 2007, in Massachusetts vs. EPA, the Supreme Court directed the U.S. Environmental Protection Agency (EPA) Administrator to determine whether GHG emissions from new motor vehicles cause or contribute to air pollution that may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. In making these decisions, the EPA Administrator is required to follow the language of Section 202(a) of the Clean Air Act (CAA). On December 7, 2009, the EPA Administrator signed a final rule with two distinct findings regarding GHGs under Section 202(a) of the CAA:

- The EPA Administrator found that elevated concentrations of GHGs—carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydroflourocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6)—in the atmosphere threaten the public health and welfare of current and future generations. This is referred to as the "endangerment finding."
- The EPA Administrator further found that the combined emissions of GHGs CO_2, CH_4, N_2O, and HFCs from new motor vehicles and new motor vehicle engines contribute to the GHG air pollution that endangers public health and welfare. This is referred to as the "cause or contribute finding."

These two findings were necessary to establish the foundation for regulation of GHGs from new motor vehicles as air pollutants under the CAA.

Energy Independence and Security Act. On December 19, 2007, President George Bush signed the Energy Independence and Security Act of 2007. Among other key measures, this act legislated the following, which are intended to aid in the reduction of GHG emissions:

1. Increase the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard requiring fuel producers to use at least 36 billion gallons of biofuel by 2022.
2. Set a target of 35 miles per gallon for the combined fleet of cars and light trucks by model year 2020; direct the National Highway Traffic Safety Administration to establish a fuel economy program for medium- and heavy-duty trucks and create a separate fuel economy standard for work trucks.
3. Prescribe or revise standards affecting regional efficiency for heating and cooling products and procedures for new or amended standards, energy conservation, and energy efficiency labeling for consumer electronic products, residential boiler efficiency, electric motor efficiency, and home appliances.

State

Assembly Bill (AB) 1493. In a response to the transportation sector accounting for more than half of California’s CO_2 emissions, AB 1493 (Pavley) was enacted on July 22, 2002. AB 1493 required the California Air Resources Board (CARB) to set GHG emissions standards for passenger vehicles, light-duty trucks, and other vehicles determined by CARB to be vehicles whose primary use is noncommercial personal transportation. The bill required that CARB set GHG emissions standards for motor vehicles manufactured in 2009 and all subsequent model years. CARB adopted the standards in September 2004. On March 29, 2010, the CARB Executive Officer approved revisions to the motor vehicle GHG standards to harmonize the state program with the national program for 2012–2016 model years. The revised regulations became effective on April 1, 2010.

Executive Order S-3-05. In June 2005, Governor Arnold Schwarzenegger established California’s GHG emissions reduction targets in Executive Order S-3-05. The executive order established the following goals: reduce GHG emissions to 2000 levels by 2010, to 1990 levels by 2020, and to 80% below 1990 levels by 2050. The California EPA secretary is required to coordinate efforts of various agencies to collectively and efficiently reduce GHGs. The Climate Action Team is responsible for implementing global warming emissions reduction programs. Representatives from several state agencies comprise the Climate Action Team. The Climate Action Team fulfilled its report requirements through the *Final 2006 Climate Action Team Report to the Governor and Legislature* (CAT 2006).

The 2009 *Climate Action Team Biennial Report* (CAT 2010a), published in April 2010, expands on the policy outlined in the 2006 assessment. The 2009 report provides new information and scientific findings regarding development of new climate and sea level projections using new information and tools that recently became available. It also evaluates climate change within the context of broader social changes, such as land use changes and demographics. The 2009 report identifies the need for additional research in several areas related to climate change to support effective climate change strategies. The areas of climate change determined to require future research are vehicle and fuel technologies, land use and smart growth, electricity and natural gas, energy efficiency, renewable energy and reduced carbon energy sources, low GHG technologies for other sectors, carbon sequestration, terrestrial sequestration, geologic sequestration, economic impacts and considerations, social science, and environmental justice.

Subsequently, the 2010 *Climate Action Team Report to Governor Schwarzenegger and the California Legislature* (CAT 2010b) reviews past climate action milestones, including voluntary reporting programs; GHG standards for passenger vehicles; the Low Carbon Fuel Standard, a statewide renewable energy standard; and the cap-and-trade program. Additionally, the 2010 report includes a cataloguing of recent research and ongoing projects; mitigation and adaptation strategies identified by sector (e.g., agriculture, biodiversity, electricity, and natural gas); actions that can be taken at the regional, national, and international levels to mitigate the adverse effects of climate change; and today’s outlook on future conditions.

AB 32. In furtherance of the goals established in Executive Order S-3-05, the legislature enacted AB 32 (Núñez and Pavley), the California Global Warming Solutions Act of 2006, which Governor Schwarzenegger signed on September 27, 2006. The GHG emissions limit is equivalent to the 1990 levels, which are to be achieved by 2020.

CARB has been assigned to carry out and develop the programs and requirements necessary to achieve the goals of AB 32. Under AB 32, CARB must adopt regulations requiring the reporting and verification of statewide GHG emissions. This program is used to monitor and enforce compliance with the established standards. CARB is also required to adopt rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emissions reductions. AB 32 allows CARB to adopt market-based compliance mechanisms to meet the specified requirements. Finally, CARB is ultimately responsible for monitoring compliance and enforcing any rule, regulation, order, emissions limitation, emissions reduction measure, or market-based compliance mechanism adopted.

The first action under AB 32 resulted in the adoption of a report listing early action GHG emissions reduction measures on June 21, 2007. The early actions included three specific GHG control rules. On October 25, 2007, CARB approved an additional six early action GHG reduction measures under AB 32. The three original early action regulations meeting the narrow legal definition of “discrete early action GHG reduction measures” are as follows:

1. A low-carbon fuel standard to reduce the “carbon intensity” of California fuels.

2. Reduction of refrigerant losses from motor vehicle air conditioning system maintenance to restrict the sale of "do-it-yourself" automotive refrigerants.
3. Increased CH_4 capture from landfills to require broader use of state-of-the-art CH_4 capture technologies.

The additional six early action regulations, which were also considered "discrete early action GHG reduction measures," are as follows:

1. Reduction of aerodynamic drag, and thereby fuel consumption, from existing trucks and trailers through retrofit technology.
2. Reduction of auxiliary engine emissions of docked ships by requiring port electrification.
3. Reduction of PFCs from the semiconductor industry.
4. Reduction of propellants in consumer products (e.g., aerosols, tire inflators, and dust removal products).
5. Requirements that all tune-up, smog check, and oil change mechanics ensure proper tire inflation as part of overall service in order to maintain fuel efficiency.
6. Restriction on the use of SF_6 from non-electricity sectors if viable alternatives are available.

An additional five measures were recommended as additional early actions as follows:

1. Refrigerant Tracking, Reporting, and Recovery Program.
2. Cement (A): Energy Efficiency of California Cement Facilities; involves reducing CO_2 emissions from fuel combustion, calcination, and electricity use by converting to a low-carbon fuel-based production, decreasing fuel consumption, and improving energy efficiency practices and technologies in cement production.
3. Cement (B): Blended Cements; the addition of blending materials such as limestone, fly ash, natural pozzolan, and/or granulated blast furnace slag (GBFS) to replace some of the clinker in the production of portland cement.
4. Anti-idling enforcement.
5. Collaborative research to understand how to reduce GHG emissions from nitrogen land application.

As required under AB 32, on December 6, 2007, CARB approved the 1990 GHG emissions inventory, thereby establishing the emissions limit for 2020. The 2020 emissions limit was set at 427 million metric tons of CO_2 equivalent (MMT CO_2E). In addition to the 1990 emissions inventory, CARB also adopted regulations requiring mandatory reporting of GHGs for large facilities that account for 94% of GHG emissions from industrial and commercial stationary sources in California. Approximately 800 separate sources fall under the new reporting rules and include electricity generating facilities, electricity retail providers and power marketers, oil refineries, hydrogen plants, cement plants, cogeneration facilities, and other industrial sources that emit CO_2 in excess of specified thresholds.

On December 11, 2008, CARB approved the *Climate Change Proposed Scoping Plan: A Framework for Change* (Scoping Plan) (CARB 2008) to achieve the goals of AB 32. The Scoping Plan establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions. The Scoping Plan evaluates opportunities for sector-specific reductions, integrates all CARB and Climate Action Team early actions and additional GHG reduction measures by both entities, identifies additional measures to be pursued as regulations, and outlines the role of a cap-and-trade program.

The key elements of the Scoping Plan are as follows:

- Expanding and strengthening existing energy efficiency programs, as well as building and appliance standards.
- Achieving a statewide renewables energy mix of 33%.
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system and to cap sources contributing 85% of California's GHG emissions.
- Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets.
- Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard.
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of California's long-term commitment to AB 32 implementation.

The First Update to the Climate Change Scoping Plan (Scoping Plan Update) was approved by the CARB Board on May 22, 2014. The Scoping Plan Update builds on the initial Scoping Plan with new strategies and recommendations. The update identifies opportunities to leverage existing and new funds to further drive GHG emissions reductions through strategic planning and targeted low-carbon investments. The Scoping Plan Update defines CARB's climate change priorities for the next 5 years, and sets the groundwork to reach California's long-term climate goals set forth in Executive Orders S-3-05 and B-16-2012. The update highlights California's progress toward meeting the near-term 2020 GHG emissions reduction goals defined in the initial Scoping Plan. These efforts were pursued to achieve the near-term 2020 goal, and created a framework for ongoing climate action that can be built upon to maintain and continue economic sector-specific reductions beyond 2020, as required by AB 32.

The Scoping Plan Update identifies key focus areas or sectors (energy, transportation, agriculture, water, waste management, and natural and working lands), along with short-lived climate pollutants, "green" buildings, and the cap-and-trade program (CARB 2014a). The update also recommends that a statewide mid-term target and mid-term and long-term sector targets be established toward meeting the 2050 goal established by Executive Order S-3-05 to reduce California's GHG emissions to 80% below 1990 levels, although no specific recommendations are made.

Executive Order S-13-08. Governor Schwarzenegger issued Executive Order S-13-08 on November 14, 2008. The executive order is intended to hasten California's response to the impacts of global climate change, particularly sea level rise. It directs state agencies to take specified actions to assess and plan for such impacts. It directed that the California Natural Resources Agency, in cooperation with the California Department of Water Resources, the California Energy Commission (CEC), California's coastal management agencies, and the Ocean Protection Council, request that the National Academy of Sciences prepare a Sea Level Rise Assessment Report by December 1, 2010. The Ocean Protection Council, California Department of Water Resources, and CEC, in cooperation with other state agencies, were required to conduct a public workshop to gather information relevant to the Sea Level Rise Assessment Report. The Business, Transportation, and Housing Agency was ordered to assess, within 90 days of the order, the vulnerability of the state's transportation systems to sea level rise. The Office of Planning and Research and the California Natural Resources Agency were required to provide land use planning guidance related to sea level rise and other climate change impacts. The order also required other state agencies to develop adaptation strategies by June 9, 2009, to respond to the impacts of global climate change that are predicted to occur over the next 50 to 100 years. A discussion draft Adaptation Strategies Report was released in August 2009, and the final Adaption Strategies Report was issued in December 2009. To assess the state's vulnerability, the report summarizes key climate change impacts for the following areas: public health, ocean and coastal resources, water supply and flood protection, agriculture, forestry, biodiversity and habitat, and transportation and energy infrastructure. The report recommends strategies and specific responsibilities related to water supply, planning and land use, public health, fire protection, and energy conservation.

Executive Order S-14-08. On November 17, 2008, Governor Schwarzenegger issued Executive Order S-14-08. This executive order focuses on the contribution of renewable energy sources to meet the electrical needs of California while reducing GHG emissions from the electrical sector. The governor's order requires that all retail suppliers of electricity in California serve 33% of their load with renewable energy by 2020. Furthermore, the order directs state agencies to take appropriate actions to facilitate reaching this target. The California Natural Resources Agency, through collaboration with the CEC and California Department of Fish and Wildlife, is directed to lead this effort. Pursuant to a Memorandum of Understanding between the CEC and the California Department of Fish and Wildlife creating the Renewable Energy Action Team, these agencies create a "one-stop" process for permitting renewable energy power plants.

Executive Order S-21-09. On September 15, 2009, Governor Schwarzenegger issued Executive Order S-21-09. This executive order directed CARB to adopt regulation consistent with the goal of Executive Order S-14-08 by July 31, 2010. CARB was further directed to work with the California Public Utilities Commission (CPUC) and CEC to ensure that the regulation builds on the Renewable Portfolio Standard (RPS) program and is applicable to investor-owned utilities, publicly owned utilities, direct access providers, and community choice providers. Under this order, CARB is to give the highest priority to those renewable resources that provide the greatest environmental benefits with the least environmental costs and impacts on public health, and can be developed the most quickly in support of reliable, efficient, cost-effective electricity system operations. On September 23, 2010, CARB adopted regulations to implement a Renewable Electricity Standard, which would achieve the goal of Executive Order S-21-09 with the following intermediate and final goals: 20% for 2012–2014, 24% for 2015–2017, 28% for 2018–2019, and 33% for 2020 and beyond. Under the order, wind; solar; geothermal; small hydroelectric; biomass; ocean wave, thermal, and tidal; landfill and digester gas; and biodiesel would be considered sources of renewable energy. The regulation would apply to investor-owned utilities and public (municipal) utilities.

Executive Order B-30-15. On April 29, 2015, Governor Jerry Brown issued an executive order which identified an interim GHG reduction target in support of targets previously identified under S-3-05 and AB 32. Executive Order B-30-15 set an interim target goal of reducing GHG emissions to 40% below 1990 levels by 2030 to keep California on its trajectory toward meeting or exceeding the long-term goal of reducing GHG emissions to 80% below 1990 levels by 2050 as set forth in S-3-05. To facilitate achievement of this goal, B-30-15 calls for an update to CARB's Scoping Plan to express the 2030 target in terms of million metric tons of carbon dioxide equivalent. The Executive Order also calls for state agencies to continue to develop and implement GHG emission reduction programs in support of the reduction targets. Sector-specific agencies in transportation, energy, water, and forestry will be required to prepare GHG reduction plans by September 2015, followed by a report on actions taken in relation to these plans in June 2016. The Executive Order does not require local agencies to take any action to meet the new interim GHG reduction threshold. It is important to note that Executive Order B-30-15 was not adopted by a public agency through a public review process that requires analysis pursuant to CEQA Guidelines section 15064.4 and that it has not been subsequently validated by a statute as an official GHG reduction target of the State of California. The Executive Order itself states it is "not intended to create, and does not, create any rights of benefits, whether substantive or procedural, enforceable at law or in equity, against the State of California, its agencies, departments, entities, officers employees, or any other person."

Senate Bill (SB) 1368. In September 2006, Governor Schwarzenegger signed SB 1368, which requires the CEC to develop and adopt regulations for GHG emissions performance standards for the long-term procurement of electricity by local, publicly owned utilities. These standards must be consistent with the standards adopted by CPUC. This effort will help protect energy customers from financial risks associated with investments in carbon-intensive electricity generation by allowing new capital investments in power plants whose GHG emissions are as low as or lower than new combined-cycle natural gas plants. SB 1368 requires imported electricity to meet GHG performance standards in California, and requires that those standards be developed and adopted in a public process.

SB X1 2. On April 12, 2011, Governor Jerry Brown signed SB X1 2 in the First Extraordinary Session, which expanded the RPS by establishing a goal of 20% of the total electricity sold to retail customers in California per year by December 31, 2013, and 33% by December 31, 2020. Under the bill, a renewable electrical generation facility is one that uses biomass, solar thermal, photovoltaic, wind, geothermal, fuel cells using renewable fuels, small hydroelectric generation of 30 megawatts or less, digester gas, municipal solid waste conversion, landfill gas, ocean wave, ocean thermal, or tidal current and that meets other specified requirements with respect to its location. In addition to the retail sellers covered by SB 107, SB X1 2 adds local, publicly owned electric utilities to the RPS. By January 1, 2012, CPUC was required to establish the quantity of electricity products from eligible renewable energy resources to be procured by retail sellers to achieve targets of 20% by December 31, 2013; 25% by December 31, 2016; and 33% by December 31, 2020. The statute also requires that the governing boards for local, publicly owned electric utilities establish the same targets, with the governing boards responsible for ensuring compliance with these targets. CPUC is responsible for enforcement of the RPS for retail sellers, and CEC and CARB enforce the requirements for local, publicly owned electric utilities.

AB 900. On September 27, 2011, Governor Jerry Brown signed AB 900, the Jobs and Economic Improvement Through Environmental Leadership Act. Under AB 900, specific projects may be qualified for expedited and streamlined environmental review under the California Environmental Quality Act (CEQA). As stated in Section 21183 of AB 900, a project that is identified as an "environmental leadership project" under AB 900 may be certified for streamlining if the project applicant invests $100 million in California following construction, creates high-wage jobs, would not result in any net additional GHG emissions from employee transportation, and mitigation measures identified under environmental review become conditions of approval for the project, among others.

California Air Pollution Control Officers Association. The California Air Pollution Control Officers Association is the association of Air Pollution Control Officers representing all 35 air quality agencies in California. The California Air Pollution Control Officers Association is not a regulatory body, but has been an active organization in providing guidance in addressing the CEQA significance of GHG emissions, climate change, and other air quality issues.

Local

Bay Area Air Quality Management District

In relation to the Bay Area Air Quality Management District (BAAQMD), a climate protection program to reduce pollutants that contribute to global climate change and affect air quality was established. The program includes measures that promote energy efficiency, reduce vehicle miles traveled, and develop alternative sources of energy.

City of Vallejo Climate Action Plan

The City of Vallejo Climate Action Plan (CAP) was published in 2012 and created a road map to enable Vallejo to reduce GHG emissions between now and 2035. The CAP outlines a range of actions, including policies relating to green building practices, energy efficiency, transit-orientated development, mixed-use higher-density development, recycling and composting, water conservation, and renewable energy.

Operation of the Orcem project component is intended to reduce GHG emissions over the next 20 years, by providing for a partial replacement for portland cement. The average percentage reduction of CO_2E emissions compared to portland cement production is anticipated to be greater than 90%. This amounts to approximately 9 million metric tons (MT) of CO_2E over the first 20 years of operation. Through the manufacturing of a partial replacement for portland cement, the Orcem project component would be consistent with the CAP's long-term objective of reducing City-wide GHG emissions through the year 2035.

3.6.2 Existing Conditions

The Greenhouse Gas Effect and Greenhouse Gases

Climate change refers to any significant change in measures of climate, such as temperature, precipitation, or wind, lasting for an extended period (decades or longer).

Gases that trap heat in the atmosphere are often called "greenhouse gases" (GHGs). The greenhouse effect traps heat in the troposphere through a threefold process, as follows: Short-wave radiation emitted by the sun is absorbed by the Earth; the Earth emits a portion of this energy in the form of long-wave radiation; and GHGs in the upper atmosphere absorb this long-wave radiation and emit it into space and toward the Earth. This "trapping" of the long-wave (thermal) radiation emitted back toward the Earth is the underlying process of the greenhouse effect. Principal GHGs are CO_2, CH_4, N_2O, ozone (O_3), and water vapor. Some GHGs, such as CO_2, CH_4, and N_2O, occur naturally and are emitted to the atmosphere through natural processes and human activities. Of these gases, CO_2 and CH_4 are emitted in the greatest quantities from human activities. Emissions of CO_2 are largely by-products of fossil fuel combustion, and CH_4 results mostly from off-gassing associated with agricultural practices and landfills. Human-created GHGs, which have a much greater heat-absorption potential than CO_2, include fluorinated gases such as HFCs, PFCs, sulfur SF_6, and nitrogen trifluoride, which are associated with certain industrial products and processes (CAT 2006).

The greenhouse effect is a natural process that contributes to regulating the Earth's temperature. Without it, the temperature of the Earth would be about 0 degrees Fahrenheit (°F) (−18°C) instead of its present 57°F (14°C). Global climate change concerns are focused on whether human activities are leading to an enhancement of the greenhouse effect (National Climatic Data Center 2009).

The effect that each GHG has on climate change is measured as a combination of the mass of its emissions and the potential of a gas or aerosol to trap heat in the atmosphere, known as its "global warming potential" (GWP). GWP varies between GHGs; for example, the GWP of CH_4 is 21, and the GWP of N_2O is 310. Total GHG emissions are expressed as a function of how much warming would be caused by the same mass of CO_2. Thus, GHG gas emissions are typically measured in terms of pounds or tons of "CO_2 equivalent" (CO_2E).[1]

Contributions to Greenhouse Gas Emissions

In 2012, the United States produced 6,525 MMT CO_2E (EPA 2014). The primary GHG emitted by human activities in the United States was CO_2, representing approximately 82.5% of total GHG emissions. The largest source of CO_2, and of overall GHG emissions, was fossil-fuel combustion, which accounted for approximately 94.2% of the CO_2 emissions (EPA 2014).

According to the 2012 GHG inventory data compiled by CARB for the California Greenhouse Gas Inventory for 2000–2012, California emitted 459 MMT CO_2E of GHGs, including emissions resulting from out-of-state electrical generation (CARB 2014b). The primary contributors to GHG emissions in California are transportation; industry; electric power production from both in-state and out-of-state sources; agriculture; and other sources, including commercial and residential activities. These primary contributors to California's GHG emissions and their relative contributions in 2012 are presented in Table 3.6-1, GHG Sources in California.

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[1] The CO_2E for a gas is derived by multiplying the mass of the gas by the associated GWP, such that MT CO_2E = (metric tons of a GHG) × (GWP of the GHG). For example, the GWP for CH_4 is 21. This means that emissions of 1 metric ton of methane are equivalent to emissions of 21 metric tons of CO_2.

Table 3.6-1
Greenhouse Gas Sources in California

Source Category	Annual GHG Emissions (MMT CO_2E)	Percent of Total[a]
Agriculture	37.86	8.3%
Commercial uses	14.20	3.1%
Electricity generation	95.09[b]	20.7%
Industrial uses	89.16	19.4%
Recycling and waste	8.49	1.9%
Residential uses	28.09	6.1%
Transportation	167.38	36.5%
High global warming potential substances	18.41	4.0%
Totals[c]	**458.68**	**100%**

Source: CARB 2014b.

Notes:

[a] Percentage of total has been rounded.

[b] Includes emissions associated with imported electricity, which account for 44.07 MMT CO_2E annually.

[c] Totals may not sum due to rounding.

Potential Effects of Human Activity on Climate Change

According to CARB, some of the potential impacts in California of global warming include loss in snow pack, sea level rise, more extreme-heat days per year, more high-O_3 days, more large forest fires, and more drought years (CAT 2010b). Several recent studies have attempted to explore the possible negative consequences that climate change, left unchecked, could have in California. These reports acknowledge that understanding of the complex global climate system by climate scientists, and the interplay of the various internal and external factors that affect climate change, remain too limited to yield scientifically valid conclusions on a localized scale. Substantial work has been done at the international and national levels to evaluate climatic impacts, but far less information is available on regional and local impacts.

Although climate change is driven by global atmospheric conditions, climate change impacts are felt locally. Climate change is already affecting California: Average temperatures have increased, leading to more extreme-hot days and fewer cold nights; shifts in the water cycle have been observed, with less winter precipitation falling in the form of snow, and both snowmelt and rainwater running off earlier in the year; sea levels have risen; and wildland fires are becoming more frequent and intense due to dry seasons that start earlier and end later (CAT 2010b). Climate change modeling using 2000 emissions rates shows that further warming would occur, which would induce further changes in the global climate system during the current century. Changes to the global climate system and ecosystems, and to California, would include the following:

- Changes in precipitation or melting snow and ice that are altering hydrological systems and affecting water resources in terms of quantity and/or quality (IPCC 2014).

- Changes in terrestrial, freshwater and marine specific as to their geographic ranges, seasonal activities, migration patterns, and species interactions (IPCC 2014).
- Negative impacts on agricultural crop yields (IPCC 2014).
- Impacts from climate-related extremes such as heat waves, droughts, floods, wildfires, and other natural disasters (IPCC 2014).
- A decline of Sierra snowpack, which is one of three primary water sources in California (in addition to reservoirs and groundwater). The Sierra Nevada snowpack is currently at 14% of normal (California Department of Water Resources 2015).
- Rising regional sea level increases high-tide water levels and augments extreme storm-forced sea-level fluctuations, allowing more wave energy to reach farther shoreward and thus increasing the potential for coastal flooding (CEC 2012a).

3.6.3 Thresholds of Significance

The following criteria, included in Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.), will be used to determine the significance of potential GHG emissions impacts. Impacts to GHG emissions would be significant if the proposed project would:

A) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or

B) Conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

A recent judicial decision holds that a lead agency is not required to analyze the impacts of sea level rise on a proposed project because CEQA does not require an analysis of "impacts of the environment on the project" (see *Ballona Wetland Foundation* v. *City of Los Angeles* (2011) 201 Cal. App. 4th 455). Nonetheless, an analysis of sea level rise as it relates to global climate change is included, because the project site includes an area subject to the California State Lands Commission Public Trust Doctrine, and is also within the jurisdiction of the Bay Conservation and Development Commission, which are agencies subject to Executive Order S-13-08. This analysis is intended to disclose current research on sea level rise and discuss the potential effects this trend may have on the proposed project following project completion. The following threshold regarding impacts as a result of sea level rise provides that a project would have a significant environmental impact if it would:

C) Expose property and persons to the physical effects of climate change, including but not limited to flooding, public health, wildfire risk, or other impacts resulting from climate change.

Bay Area Air Quality Management District

The BAAQMD's approach to developing a threshold of significance for GHG emissions is to identify the emissions level for which a project would not be expected to substantially conflict with existing California legislation adopted to reduce statewide GHG emissions. If a project would generate GHG emissions above this threshold, the project would be considered to contribute substantially to a cumulative impact and would be considered significant.

The BAAQMD's June 2010 CEQA Guidelines suggest that for stationary source projects, GHG emissions would be considered significant if the project were to exceed 10,000 MT CO_2E per year. However, as reflected in the BAAQMD's updated May 2012 CEQA Guidelines, due to a court challenge, BAAQMD cannot recommend specific thresholds of significance for use by local governments at this time. BAAQMD has stated that lead agencies may still rely on its CEQA Guidelines for assistance in calculating air pollution emissions, obtaining information regarding the health impacts of air pollutants, and identifying potential mitigation measures.

City of Vallejo Climate Action Plan

The March 2012 City of Vallejo CAP provides a comprehensive local GHG inventory and forecast, establishes GHG emission reduction targets, and identifies a GHG reduction strategy for the City of Vallejo. The reduction strategy provides specific methods for reducing Vallejo's GHG emissions consistent with the direction of the State of California through the Global Warming Solutions Act (AB 32), Executive Order S-03-05, California Public Resources Code Section 21083.3, and BAAQMD's CEQA Air Quality Guidelines for a qualified GHG reduction strategy. The CAP and its supporting CEQA documentation establish a basis for the City to: "use the Climate Action Plan to streamline the environmental review of most developments and improvements in Vallejo. In essence, the CAP is an umbrella for all future actions that ensures Vallejo's consistency with state GHG reduction priorities. As long as future development is consistent with the goals and measures of this Plan, it is consistent with state GHG reduction targets. This consistency will allow future improvements in Vallejo to move faster and be more cost effective, saving the City and community time and money" (City of Vallejo 2012).

The forecast in the CAP utilizes the years 2020 and 2035 as target dates for overall reductions in GHG emissions in Vallejo. The CAP analysis in Chapter 3 applied community-wide growth indicators from 2008, including anticipated industrial growth and employment, to define a business-as-usual growth scenario. Under this scenario, community-wide emissions would have grown by approximately 11% by the year 2020 to 650,340 MT CO_2E and by 24% by 2035 to 728,170 MT CO_2E. Growth during these periods from the "Commercial/Industrial" sector was estimated at between 15,710 MT CO_2E (by 2020) and 42,840 MT CO_2E (by 2035). The City established a reduction target of 15% below existing emission levels by 2020 in conformance with the State of California's recommended reduction target. To attain this reduction target, the City's CAP sets forth measures to reduce emissions by 23% below the City's business-as-usual emissions, and further includes measures to achieve a 64% reduction below present levels by 2035 in order to achieve conformance with the state goal of 80% below 1990 levels by 2050. The State of California's long-term goal to reduce emissions to 80% below 1990 levels by 2050 is included in the CAP's forecast emissions (City of Vallejo 2012).

The reduction strategy contained in Chapter 4 of the City's CAP addresses specific measures to be implemented, both with respect to City operations and in guidance of private development throughout the community, in order to achieve the targeted GHG reduction goals. The CAP's detailed Implementation Actions as outlined in Chapter 5 outlines the ways in which the City plans to reduce GHG emissions 15% below baseline levels through changes in land use and travel behaviors, more efficient and cleaner energy use, and additional conservation of natural resources.

3.6.4 Impact Discussion

A) Would the project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

Construction Impacts

The BAAQMD does not specify a significance threshold for construction GHG emissions; however, the BAAQMD 2010 Guidelines recommend quantifying and disclosing construction GHG emissions, as provided below.

VMT Analysis

Detailed equipment utilization associated with VMT construction is included in Appendix D-1. In summary, Phase 1 of VMT construction would replace the deteriorated timber wharf with a concrete pile supported wharf with structural concrete deck, associated mooring and fender system, and related improvements for deep-water marine transportation operations. This phase of construction would include the following:

- Approximately 10,300 cubic yards (cyd) of fill, the majority of which would be placed within the footprint of the existing wharf.
- Approximately 10,900 cyd of fill, to bring the finished elevation to +11.5 feet mean lower low water as needed for the proposed stormwater control plan.
- Approximately 89,800 cyd of dredging, to a design depth of 38 feet below mean lower low water (MLLW). The dredged material may be reused on site as engineered backfill, or would be transported from the site via barges and associated tugboats and disposed of

in a marine disposal site within 3 miles of the project site. Dredging activities would be subject to a permit from the U.S. Army Corps of Engineers.

- Installation of a steel maintenance shed.
- Upgrading and realignment of the existing rail service.
- Demolition of an existing warehouse building and site improvements.

Phase 1 of VMT construction is anticipated to begin in June 2016 and would require 4 to 6 months to complete. VMT Phase 1 would be constructed simultaneously with the Orcem project component.

In Phase 2 of VMT construction, a rock dike would be constructed to accommodate shallower draft vessels, including barges. The Phase 2 rock dike would consist of riprap and associated improvements of approximately 600 feet in length north of and adjoining the Phase 1 wharf. This phase of construction would include the following:

- Approximately 15,800 cyd of fill would be transported to the site via barges and associated tugboats.
- Approximately 19,580 cyd of grading fill to bring the laydown area to a finished grade of 11.5 feet above MLLW.
- Approximately 46,500 cyd of dredging to a design depth of 25 to 38 feet below MLLW. The dredged material would be transported from the site via barges and associated tugboats and disposed of in a marine disposal site within 3 miles of the project site.

Phase 2 of the VMT project component would be constructed following the completion of Phase 1. The start of Phase 2 does not currently have a pre-determined commencement date, as construction of this phase would be contingent on future market demand.

Sources of emissions for both construction phases would include off-road construction equipment exhaust, on-road vehicles exhaust and entrained road dust (i.e., haul trucks, concrete trucks, worker vehicles), exhaust from tugboats used to position dredging barges, fugitive dust associated with site preparation and grading activities, and paving and architectural coating activities.

In addition, although construction is not expected to begin until 2016, the construction analysis, which was completed in August 2014, assumes a construction start date of January 2015, as well as the simultaneous construction of the Orcem portion of the project, and Phase 1 and Phase 2 construction in sequence. Because construction equipment fleets become cleaner over time, due to regulatory requirements, the analysis of construction emissions based on a 2015 starting year conservatively overestimates 2016 construction impacts.

Table 3.6-2 shows the GHG emissions anticipated for construction of the VMT project component.

Table 3.6-2
VMT Construction Greenhouse Gas Emissions

Source	GHG Emissions (MT CO_2E/year)
Phase 1	
2015 (CalEEMod)	68
2015 (Tug operations)	26
Total Phase 1	*94*
Phase 2	
2016 (CalEEMod)	68
2016 (Tug operations)	37
Total Phase 2	*105*
Total VMT Construction Emissions	**199**

Source: Appendix D-1

Orcem Analysis

Development of the Orcem project component would involve construction and operation of an industrial facility for the production of a high performance, less polluting replacement for the traditional portland cement material used in most California construction projects. In particular, Orcem is proposing to construct and operate a plant on the site which focuses primarily on production of ground granulated blast furnace slag (GGBFS). However, the Orcem Plant may also produce cement from clinker. The Orcem Plant would involve construction of approximately 73,000 square feet of buildings and equipment, together with outdoor storage areas, on a 4.83-acre portion of the former General Mills plant site leased from VMT. Several of the buildings and equipment previously used by General Mills within the Orcem Site would be demolished in order to accommodate construction and operation of the proposed cement products production facility. The project would be constructed in phases to coincide with the growth in demand for Orcem’s products. Orcem would import most of the raw materials used in the proposed plant via the proposed wharf on the adjoining VMT Site.

The Orcem Plant would be constructed in phases to coincide with the growth in demand for Orcem’s products, but is anticipated to be constructed from January 2016 through June 2017. As described in the VMT construction discussion, although Orcem construction is not expected to begin until 2016, the construction analysis, which was completed in August 2014, assumes a construction start date of January 2015, as well as the simultaneous construction of the VMT project component. Because construction equipment fleets become cleaner over time, due to regulatory requirements, the analysis of construction emissions based on a 2015 starting year conservatively overestimates 2016 construction emissions.

Table 3.6-3 shows the GHG emissions anticipated for the construction of the Orcem Plant.

Table 3.6-3
Orcem Construction Greenhouse Gas Emissions

	GHG Emissions (MT CO_2E/year)
2015	369
2016	62
Total	**431**

Source: Appendix D-1

Combined VMT and Orcem Project Analysis

Table 3.6-4 shows the GHG emissions anticipated for construction of both the Orcem and VMT project components. Although the proposed project would generate GHG emissions during construction, construction would be temporary and would not exceed a significance threshold since BAAQMD has not identified a threshold for construction. Therefore, the impact would be **less than significant**.

Table 3.6-4
Combined VMT and Orcem Construction Greenhouse Gas Emissions

	GHG Emissions (MT CO_2E)
VMT	199
Orcem	431
Total	**630**

Source: Appendix D-1

Operational Impacts

Orcem would import its raw materials (GBFS, clinker, portland cement, gypsum, limestone, and pozzolan) for production via several methods of transport including ocean-going vessels which would berth at the VMT wharf. The raw materials would be unloaded and transported to open or covered stockpiles on the site, as appropriate, to fully contain fugitive dust. The raw materials would then be reclaimed from these stockpiles by front-end loaders to be transported by conveyors into sealed processing equipment for milling into fine powders (the finished products). The finished products would be transported in sealed conveyance systems into storage silos, for subsequent loading into truck or rail tankers for distribution to customers in the region. GGBFS is manufactured by recycling a byproduct, GBFS, from the steel industry. It is used as a partial replacement for traditional cement, also known as portland cement.

The operational phase of the development would include both Orcem and VMT operating their respective areas of the site simultaneously.

Emissions sources during operation of the facilities would include the following:

- Transportation
    - Terminal activity (ship exhaust emissions, tug boats, vessel loading/unloading)
    - Truck movements both on site and on the local road network
    - Rail activity
    - Barge activity
    - Off-road vehicle movements on site including operation of front-end loaders and forklifts
- Material handling emissions generated from stockpiling, unloading of material, material drop points, etc.
- Fugitive dust emissions from hopper and bag filters
- Air emissions from point P-1 (main stack)

The material throughput for both the Orcem and VMT projects would increase over time, as shown in Table 3.6-5. The greatest air quality impacts would result from the activities described in scenario number 3, where the maximum material is moved through the facilities via trucks and rail. This maximum transportation mode would not occur until at least 2020. Accordingly, the emissions are analyzed for 2020 fleet year for the shipping scenario where 160,000 MT of material is shipped to the facility monthly via four vessels, and of that, 91,900 MT is shipped off site by truck, and 68,100 MT is shipped off site by rail. As described in Chapter 2, Project Description, the maximum train size would be 77 cars; however, this analysis evaluates the impacts of 100-car trains, which is a conservative estimate. As described in Chapter 2, the number of rail cars in any given month and week will fluctuate based on the type of product that is being transported from the project site to market, but the average number of rail cars is anticipated to be 800 to 1,200 per month limited to no more than 14,400 project related rail cars per year.

Table 3.6-5
VMT and Orcem Operational Throughput

Average Monthly Transportation Activity	Ships (#)	Barge (MT/month)	Trucks (MT/month)	Rail (MT/month)	Total (MT/month)
1) Orcem Phase 1 GBFS + VMT Truck Only	2	0	81,700	0	81,700
2) Orcem Phase 2 GBFS + VMT Truck and Rail	3	0	44,000	76,000	120,000
3) Orcem Phase 2 GBFS + VMT Truck and Rail Alternative	4	0	91,900	68,100	160,000

Table 3.6-5
VMT and Orcem Operational Throughput

Average Monthly Transportation Activity	Ships (#)	Barge (MT/month)	Trucks (MT/month)	Rail (MT/month)	Total (MT/month)
4) Orcem Phase 2 GBFS/Clinker + VMT Truck, Rail and Barge	4	48,300	81,200	30,500	160,000
5) Orcem Phase 2 GBFS/Clinker + VMT Truck, Rail and Barge Alternative	4	6,600	89,200	64,200	160,000

Source: Appendix D-1

VMT Analysis

The proposed VMT project component would include a multi-phased bulk and break-bulk aggregate import and distribution facility on the existing terminal footprint. The general transportation method would be to unload dry bulk or break-bulk cargo from vessels, temporarily store, and reclaim from storage to cargo trucks and railcars for local and regional distribution. In addition, the terminal design would allow reloading of cargo to barges, enabling VMT to engage in short sea shipping initiatives with other California and West Coast ports and terminals. As an operational deep draft facility, the VMT Terminal would handle a wide range of commodities including, but not limited to, the following:

- Feed grains
- Manufactured steel
- Timber/lumber
- Rock, aggregate, ores, and related materials (including GBFS, clinker, and related materials used as part of the Orcem project component)
- Project-based break-bulk items (e.g., heavy lift transport, large construction assemblies)
- Marine construction materials

The VMT operational analysis reflects operation of the VMT Terminal without barge access; this scenario represents the greatest impacts because it requires the transport of all products from the facility via truck and rail, which would result in greater impacts than barge transport. The emissions analysis is based on detailed calculations and engineering data. Emissions were calculated using industry-accepted sources including CARB’s Off-Road Emission Inventory, EMFAC2014, EPA AP-42, and vendor data. Complete details regarding the derivation of emission rates for various sources at the VMT component are provided in Appendix D-1.

An estimate of the maximum annual GHG emissions from operation of the VMT project component is outlined in Table 3.6-6.

Table 3.6-6
VMT Operational GHG Emissions

Operations	CO_2 (MTs/yr)	CH_4 (MT/yr)	N_20 (MT/yr)
Shipping (sea buoy to dock)	1,253	0.122605997	0.07008
Barge	0	0	0
Unpaved Road (forklift)	38	0	0
Unpaved Road (front-end loader and excavator)	548	0	0
Industrial Paved Road (finished product)	34	0	0
Public Paved Road	2,312	0	0
Rail	380	0.030299965	0.0099337
On-site GHG Emissions (CalEEMod)	269	0	0
Total MT per year	**4,835**	**0.152860602**	**0.0798322**
Total CO_2E per year	**4,835**	**3.21**	**24.75**
Total MT CO_2E per year	**4,863**		

Source: Appendix D-1

Orcem Analysis

The primary raw material utilized at the Orcem Plant would be GBFS, a recycled by-product from the first stage in the production of steel. GBFS has the appearance and handling characteristics of coarse beach sand. At the Orcem Plant, GBFS would be dried and ground to a very fine GGBFS powder.

Operational activities at the Orcem Facility that would generate GHG emissions include ship/barge unloading, material unloading and handling, off-road equipment operations, process building operations, truck movements on the local road network, and rail movement accessing the Orcem Facility.

Estimates of the CO_2, CH_4, and N_2O emissions from Orcem operations are presented in Table 3.6-7. The Orcem operational analysis reflects operation at a maximum production rate of up to 900,000 MT per year of which 760,000 MT per year would be milled. The emissions analysis is based on detailed calculations, engineering data, and an operating schedule of 365 days per year. Emissions were calculated using industry-accepted sources including CARB's Ocean Going Vessels Marine Emissions Model, CARB's California Harbor Craft Emissions Inventory Database, CARB's OFFROAD2011 off-road equipment inventory, CARB's EMFAC2014 on-road vehicle emissions inventory, EPA AP-42, and vendor data. Detailed calculations are presented in Appendix D-1.

In particular, emissions of CO_2, CH_4, and N_2O from the hot air generator, used in the drying process, would be released via a 50-meter (164 feet) stack. Emissions were calculated based on vendor data and default EPA AP-42 emission rates and additional conservative assumptions related to emission variability.

Complete details regarding the derivation of emission rates for various activities at the Orcem Plant are provided in Appendix D-1. GHG emissions are estimated based on the same operational parameters that were used to estimate criteria air pollutants as described in Section 3.2, Air Quality.

Table 3.6-7
Orcem Plant Operational GHG Emissions

Operations	CO_2 (MT/yr)	CH_4 (MT/yr)	N_20 (MT/yr)
Shipping (from the sea buoy)	810	0.08	0.05
Hopper/Conveyor	129	0	0
Unpaved Road (front-end loader and excavator)	873	0	0
Industrial Paved Road (finished product)	53	0	0
Public Paved Road	2,908	0	0
Stack (natural gas)	13,899	0.56	0.15
Electricity (production)	7,357	0	0
Rail	117	0.01	0.00
On-site GHG Emissions (CalEEMod)	379	0	0
Total MT per year	**26,524**	**0.65**	**0.20**
Total MT CO_2E per year	**26,524**	**13.55**	**63.27**
Total MT CO_2E per year	**26,601**		

Source: Appendix D-1

Proposed Orcem Operations Compared with Traditional Cement Production GHG Emissions

Operational emissions of the Orcem Plant would exceed BAAQMD's threshold of 10,000 MT CO_2E per year. However, while the estimates in Table 3.6-7 take into account shipping and on-site emission sources from proposed operations, they do not take into account the reductions in GHG emissions associated with use of the Orcem product (GGBFS) in lieu of traditional portland cement. As documented in Chapter 2.0, Project Description, use of GGBFS would reduce CO_2 and other GHG component emissions by a larger corresponding annual amount. Emissions estimates shown in Table 3.6-7 conservatively exclude the GHG emission reductions associated with GGBFS utilization in construction projects because of the possibility that the Orcem Plant may produce either blended GGBFS or portland cement products.[2]

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[2] When operating in Mode 2.

CARB identified the cement industry as a significant source of GHGs and placed the industry on its list of areas for development of early action measures to reduce such emissions. The major opportunities for GHG emission reductions involved replacing some of the traditional portland cement with other materials including GGBFS.

Table 3.6-8 presents a comparison between annual CO_2E emissions for Orcem operations and comparable cement production. Table 3.6-8 shows that GGBFS production would contribute to much lower GHG impacts than cement production.

Table 3.6-8
Annual CO2E Reductions Associated with Production of GGBFS by Orcem (MT)

	GGBFS Tonnage Produced (MT)	Equivalent CO_2E Emissions Associated with Traditional Cement Production (MT)[1]	CO_2E Emissions Associated with GGBFS (MT)	Net Reduction in CO_2E Emissions
Mode 1	582,928	501,320	48,581	452,737 (90% reduction)
Mode 2	844,444	726,222	699,149	27,073 (3.7% reduction)
Mode 3	702,928	604,518	148,240	456,278 (75% reduction)

Source: Appendix D-1
Notes:
Mode 1: Importation of GBFS and grinding it to produce GGBFS.
Mode 2: Importation of clinker and grinding to produce traditional cement. Clinker is the raw material that is ground to produce cement
Mode 3: Importation of GBFS and grinding it to produce GGBFS (Mode 1) + importation of traditional cement
[1] 0.86 ton of CO_2E/MT of cement (Pyle 2008).

In relation to the production of GGBFS by Orcem, the GHG emission reductions that are realized when compared to GHG emissions from traditional cement production are substantial. As shown in Table 3.6-8, the average percentage decrease in emissions compared to portland cement production is greater than 90% and amounts to approximately 450,000 MT of CO_2E for Mode 1, Milestone 5.

In relation to Mode 2, the production of cement from clinker by Orcem would lead to a more modest reduction in GHG emissions when compared to GHG emissions generated from traditional cement production. The average percentage reduction compared to portland cement production is greater than 3% and amounts to approximately 27,000 MT of CO_2E for Mode 2.

Mode 3 operations would involve the production of primarily GGBFS from GBFS with some additional cement imported/exported from the facility. Under this mode of operation, GHG emission savings when compared to GHG emission from purely traditional portland cement production would be substantial. The average percentage reduction compared to portland cement production is greater than 70% and amounts to approximately 450,000 MT of CO_2E for Mode 3.

In summary, all proposed modes of operation at the Orcem Plant would lead to GHG emission reductions when compared to traditional portland cement production. Although the reduction in GHG emissions with regard to Mode 2 are modest, it is the intention of Orcem to primarily operate in either Mode 1 or Mode 3, with Mode 2 available under circumstances that the principle raw material, GBFS, is not available.

It is anticipated that the Orcem Plant would primarily operate in GGBFS production and not in cement production mode. However, estimated Orcem GHG emissions would exceed the BAAQMD threshold of 10,000 MT CO_2E per year in Mode 1, Mode 2, and Mode 3. Orcem is committed to reducing GHG as much as is feasible and would be fully consistent with all applicable reduction measures of the CAP and by extension the CARB Scoping Plan.

Combined VMT and Orcem Project Analysis

Table 3.6-9 shows the combined emissions from operation of the VMT and Orcem project components, including on-site electricity consumption.

Table 3.6-9
Annual CO_2E Emissions from Combined VMT and Orcem Operations

Scenario	Operational Phase	CO_2 (MT/yr)	CH_4 (MT/yr)	N_20 (MT/yr)
Orcem Mode 1, Milestone 5 and VMT Phase 2 Alternative	Shipping	2,022	0.20	0.12
	Hopper Conveyor	129	0	0
	Unpaved Road (forklift)	38	0	0
	Unpaved Road (front loader and excavator)	1,421	0	0
	Industrial Paved Road (finished product)	87	0	0
	Public Paved Road	5,220	0	0
	Stack (natural gas)	13,899	0.56	0.15
	Electricity (production)	7,357	0	0
	Rail	498	0.04	0.01
	On-site GHG Emissions (CalEEMod)	647	0	0
	Total MT per year	**31,358**	**0.80**	**0.28**
	Total MT CO_2E per year	**31,358**	**16.76**	**88.16**
	Total MTs CO_2E per year	**31,464**		

Source: Appendix D-1

As shown in Table 3.6-9, combined emissions from operation of the VMT and Orcem project components would result in approximately 31,464 MT CO_2E per year, which does not account for savings through the production of GGBFS in lieu of traditional portland cement. Although life-cycle emissions would result in a reduction in GHG emissions, the stationary source emissions of the proposed project would be greater than the BAAQMD's threshold of 10,000 MT CO_2E/year. Impacts would therefore be considered **significant** (**Impact 3.6-1).**

B) Would the project conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs?

VMT and Orcem Project Analysis

The Climate Change Scoping Plan approved by CARB on December 12, 2008, and updated in May 2014 provides an outline for actions to reduce California's GHG emissions. The Scoping Plan requires CARB and other state agencies to adopt regulations and other initiatives to reduce GHGs.

Additionally, the City of Vallejo adopted the City of Vallejo Climate Action Plan, which focuses on reducing GHG emissions through the following topics: green building practices, energy efficiency, transit-oriented development, mixed-use and higher-density development, recycling and composting, water conservation, and renewable energy. Because the proposed project would include upgrading an existing inactive marine terminal and reactivating a previous industrial facility, the proposed project would not conflict with or obstruct the goals and measures provided in the City of Vallejo Climate Action Plan. In addition, both the VMT and Orcem project components would incorporate measures to achieve consistency with all applicable Reduction Strategies and Implementation Actions contained in the 2012 CAP as described in Table 3.6-10, helping to achieve the overall City-wide GHG reduction goals as outlined previously.

Table 3.6-10 demonstrates the proposed project's consistency with various strategies of the CAP.

Table 3.6-10
Proposed Project Consistency with City of Vallejo Climate Action Plan

Strategy	Definition	Project Consistency
City Government Operations (CG) Strategies		
Strategy – CG-3 (Lighting)	Retrofit City-owned or -operated lighting and related mechanical systems.	• Orcem would install street/outdoor lighting with high-efficiency lights such as light-emitting diode (LED) or induction lighting. • Orcem would customize their lighting schedule for exterior lighting to minimize the use of lighting during unnecessary and underutilized times.
Strategy – CG-8 (Employee Commute Alternatives)	Provide information and incentives for City staff to carpool, use public transportation, walk, or bike to work.	• Orcem would encourage, where possible, employee commute alternatives such as carpooling and biking options.
Energy (E) Strategies		
Strategy – E-2 (Building Standards)	Require all new development to meet the minimum California Title 24 and California Green Building Standards Code requirements, as amended, and encourage new	• Orcem and VMT would ensure that all new buildings on site adopt the California Title 24 minimum requirements, and that new construction would adhere to Tier 1 or Tier 2 standards of the CALGreen Code

Table 3.6-10
Proposed Project Consistency with City of Vallejo Climate Action Plan

Strategy	Definition	Project Consistency
	development to exceed the minimum requirements.	requirements.
Strategy – E-3 (Smart Meters)	Increase the community's awareness and utilization of real-time energy consumption data available through PG&E's SmartMeter™ program.	• Orcem would install PG&E's SmartMeters™ on site for the control room, maintenance shop and offices, and other nonproprietary process-related equipment. Also, indoor real-time energy monitors would be installed. In addition, rebate programs that give priority to appliances with smart grid technology would be used, when possible.
Strategy – E-4 (Cool Roofs and Pavements)	Increase tree planting and the use of cool roofs and cool pavement materials to reduce the urban heat island effect and corresponding energy consumption. Implement tree replacement policy for projects where tree removal is necessary.	• Orcem would meet new building Title 24 requirements for cool roofs, which require a minimum solar reflectance index (SRI) of 10 for steep-slope roofs and 64 for low-slope roofs. • Orcem would reduce exterior heat gain for 50% of non-roof impervious site surfaces (roads, sidewalks, parking lots, driveways) through one or both of the following mechanisms: ○ Achieve 50% paved surface shading within 5 to 10 years by planting trees and other vegetation and/or installing solar panels or shading structures above parking. ○ Use paving materials with an SRI of at least 29 for all surfaces. Where appropriate, Orcem's GGBFS product may be used to achieve SRI values of up to 60 in exchange for flexibility in other areas. • Orcem is committed to planting trees on site to the greatest extent feasible while allowing for operational flexibility.
Renewable Energy (RE) Strategies		
Strategy – RE-1 (Renewable Energy Usage)	Support the installation of small-scale renewable energy systems including solar photovoltaic, solar thermal, and wind, river current, and tidal energy conversion systems.	• Orcem would investigate the option of installing solar energy panels on site. Orcem would also pre-wire and pre-plumb the facility for solar and solar thermal installations.
Transportation Demand Management (TDM) Strategies		
Strategy – TDM-1 (Local Businesses)	Promote buy local and related initiatives that support local commerce and reduce the need for extensive transport.	• Orcem would actively investigate options to buy local goods, food supplies, and services. • Orcem would participate in award programs that recognize local employers who provide outstanding contributions to the quality of life in the community, including "green" businesses.

Table 3.6-10
Proposed Project Consistency with City of Vallejo Climate Action Plan

Strategy	Definition	Project Consistency
		• Orcem would support strategies to increase local business-to-business commerce.
Strategy – TDM-4 (Parking)	Revise parking requirements for new commercial and multifamily projects and implement the Downtown Parking Meter Installation Plan.	• Orcem would provide accommodations for employees and visitors using bicycles, based on actual demand.
Strategy – TDM-7 (Commute Behavior)	Reduce emissions from commute travel to and from schools and workplaces.	• Orcem would support guaranteed ride home programs, including preferential parking spaces, employer-assisted ride-matching databases, recognition programs, and other incentives.
Strategy – TDM-8 (Jobs/Housing Balance)	Plan for an improved jobs/housing balance in order to reduce the need for long-distance travel from residences to places of work.	• Orcem would support the City's General Plan and corresponding regulations by providing jobs and economic revitalization that improves Vallejo's jobs/housing balance.
Optimized Travel (OT) Strategies		
Strategy – OT-3 (Anti-Idling and Traffic Calming)	Support anti-idling and traffic calming infrastructure and enforcement.	• Orcem would ensure that Commercial Vehicle Idling Regulations as adopted by the California Air Resources Board for heavy-duty vehicles are complied with on site.
Water, Wastewater, and Solid Water (W) Strategies		
Strategy – W-1 (Water Conservation Efforts)	Promote and require water conservation through outreach and pricing.	• Orcem would investigate options for conservation techniques, services, devices, and rebates.
Strategy – W-2 (Development Standard for Water Conservation)	Require water conservation in all new buildings and landscapes.	• Orcem, per the minimum requirements of the 2010 CALGreen Code, would install individual water meters for each space projected to consume more than 100 gallons per day. • Orcem, per the minimum requirements of the 2010 CALGreen Code, would install an additional water meter or sub-meter for landscaping uses. • Orcem would investigate the feasibility of using greywater, recycled water, and rainwater catchment systems.
Strategy – W-4 (Development Standard for Recycling and Composting)	Require waste diversion and use of recycled materials in new development.	• Orcem would investigate the feasibility of using recycled content products during construction, based on a minimum of 10% of total products used for on-site construction.
Off-Road Equipment (OR) Strategies		
Strategy – OR-1 (Lawn and Garden Equipment)	Encourage the use of electrified and higher efficiency lawn and garden equipment.	• Orcem would investigate the feasibility of using native vegetation in lieu of high-maintenance landscapes (such as grass turf) to reduce the need for gas-powered lawn and garden equipment.
Strategy – OR-2 (Construction Equipment)	Reduce emissions from heavy-duty construction equipment by	• Orcem and VMT would strictly enforce idling restrictions for heavy-duty vehicles in line with

Table 3.6-10
Proposed Project Consistency with City of Vallejo Climate Action Plan

Strategy	Definition	Project Consistency
	limiting idling and utilizing cleaner fuels, equipment, and vehicles.	the Commercial Vehicle Idling Regulations as adopted by the California Air Resources Board. • Clear signage would be provided at all access points to remind construction workers of idling restrictions. • All construction equipment would be maintained per manufacturer specifications. • Orcem and VMT would investigate the options for limiting GHG emissions from construction equipment through use of the following measures: o Substituting electrified equipment for diesel- and gasoline-powered equipment where practical. o Using alternatively fueled construction equipment on site, where feasible, such as compressed natural gas, liquefied natural gas, propane, biodiesel, or ultra-efficient diesel.

Although the proposed project would not directly conflict with or obstruct implementation of the City of Vallejo CAP, the CAP does not include port/maritime or rail-related emissions as part of its GHG inventory or forecast assessment. Regarding rail and port emissions, the CAP states:

> For rail and port emissions, the California Air Resources Board OFFROAD 2007 software provides emissions from rail and port activities; however, these numbers are aggregated for the entire Solano County area, which includes incorporated, unincorporated, and state or federally owned land. Without data specific to the City of Vallejo and without a reasonable methodology for attributing these activities to the city, these emissions cannot be accurately included in the community-wide GHG inventory (City of Vallejo 2012).

As such, GHG emissions associated with these sources have not been accounted for in the CAP, and port/maritime and rail-related emissions associated with the proposed project cannot be adequately analyzed for consistency with the CAP. Additionally, although it is the intent of the proposed project to provide a partial replacement for portland cement which would result in the manufacturing of a more environmentally sound product (and in turn would result in fewer GHG emissions than the production of traditional portland cement), production of GGBFS is dependent on future market demand; therefore, it cannot be guaranteed that the Orcem project component would operate in Mode 1 or Mode 3 under which reductions shown in Table 3.6-8 would be realized. For these reasons, it cannot be guaranteed that the proposed project would be consistent with the overarching objective of the City's CAP to achieve the reduction targets as established for 2020 and 2035. Impacts would be considered **significant (Impact 3.6-2)**.

Horizon Years 2030 and 2050

As described previously, Executive Order B-30-15 established a statewide emissions reduction target of 40% below 1990 levels by 2030. This interim measure was identified to keep the state on a trajectory needed to meet the 2050 goal of reducing GHG emissions to 80% below 1990 levels by 2050 pursuant to Executive Order S-3-05. CARB has already identified the target 2050 emission levels of 431 MMT CO_2E. Executive Order B-30-15 instructs CARB to similarly express the 2030 target in terms of million metric tons of carbon dioxide equivalent (MMT CO_2E).

CARB has indicated it is on track to meeting both the 2030 and 2050 goals. It states in the *First Update to the Climate Change Scoping Plan* that "California is on track to meet the near-term 2020 greenhouse gas limit and is well positioned to maintain and continue reductions beyond 2020 as required by AB 32" (see CARB 2014a, p. ES2.) With regard to the 2050 target for reducing GHG emissions to 80% below 1990 levels, the *First Update to the Climate Change Scoping Plan* (CARB 2014a, p. 34) states:

> This level of reduction is achievable in California. In fact, if California realizes the expected benefits of existing policy goals (such as 12,000 megawatts [MW] of renewable distributed generation by 2020, net zero energy homes after 2020, existing building retrofits under AB 758, and others) it could reduce emissions by 2030 to levels squarely in line with those needed in the developed world and to stay on track to reduce emissions to 80 percent below 1990 levels by 2050. Additional measures, including locally driven measures and those necessary to meet federal air quality standards in 2032, could lead to even greater emission reductions.

In other words, CARB has indicated the state is on a trajectory to meet the 2020, 2030 and 2050 GHG reduction targets set forth in AB 32, Executive Order B-30-15, and Executive Order S-3-05.

Regarding energy efficiency and compliance with AB 758, the project would not interfere with the state's implementation of building retrofits to further energy efficiency for existing buildings under AB 758. AB 758, the Comprehensive Energy Efficiency in Existing Buildings Law, tasked the CEC with developing and implementing a comprehensive program to increase energy efficiency in existing residential and nonresidential buildings that "fall significantly below the current standards in Title 24" (California Public Resources Code, Section 25943(a)(1)). Approximately 50% of existing residential and nonresidential buildings in California were constructed before California Building Energy Efficiency Standards went into effect in 1978

(CEC 2015, *Existing Buildings Energy Efficiency Action Plan* (hereafter Draft AB 758 Plan), Chapter. 1, p. 5 [also noting that existing buildings represent 20% of all GHG emissions]). Other buildings constructed after 1978 also fall below current Title 24 standards and present significant opportunities for energy efficiency improvements (CEC 2015). Pursuant to AB 758, the CEC is in the process of developing an Existing Building Energy Efficiency Action Plan that identifies strategies to implement energy efficient renovations for such existing commercial, residential, and publicly owned buildings. Strategies include making information about a building's energy efficiency more readily available, educating the public about the cost benefit of energy upgrades, making attractive financing more readily available, educating the public and contractors about available energy upgrades and code compliance requirements, and educating a work force capable of implementing energy upgrades. (CEC 2015, Ch. 4, pp. 91–102). Structures built as part of the project would be constructed in compliance with current Title 24 standards and therefore would not interfere with CEC or other initiatives implemented to increase energy efficiency and reduce GHG emissions associated with existing buildings that do not adhere to Title 24 standards.

As discussed previously, although the proposed project would not directly conflict with or obstruct implementation of the City of Vallejo CAP, and thus targets set forth in AB 32, Executive Order B-30-15, and Executive Order S-3-05, the CAP does not include port/maritime or rail-related emissions as part of its GHG inventory or forecast assessment. As such, GHG emissions associated with these sources have not been accounted for in the CAP, and port/maritime and rail-related emissions associated with the proposed project cannot be adequately analyzed for consistency with the CAP. Additionally, although it is the intent of the proposed project to provide a partial replacement for portland cement which would result in fewer GHG emissions than the production of traditional portland cement, production of GGBFS is dependent on future market demand; therefore, it cannot be guaranteed that the Orcem project component would operate in Mode 1 or Mode 3 under which reductions shown in Table 3.6-8 would be realized. For these reasons, it cannot be guaranteed that the proposed project would be consistent with the overarching objective of the City's CAP to achieve the reduction targets as established for 2020 and 2035, or the state's GHG reduction goals for 2030 and 2050. Impacts would be considered **significant (Impact 3.6-3)**.

C) Would the project expose property and persons to the physical effects of climate change, including but not limited to flooding, public health, wildfire risk, or other impacts resulting from climate change?

VMT and Orcem Project Analysis

The proposed project would be subject to climate change impacts caused by GHG emissions, as described in detail in Section 3.6.2, Existing Conditions. Although it is difficult to determine scientifically valid impacts from climate change on a localized scale, some regional and global impacts could include an increase in sea level; reduced potable water supply from decreased mountain snowpack; an increase in the number of days conducive to O_3 formation; variations in weather that include changes to precipitation, ocean salinity, and wind patterns; and more extreme weather including droughts, heavy precipitation, heat waves, extreme cold, and the intensity of tropical cyclones.

Due to the location of the project site on the San Francisco Bay, sea level rise is considered the greatest impact of concern relative to climate change.

In March 2013, the Sea-Level Rise Task Force of the Coastal and Ocean Working Group of the California Climate Action Team (CO-CAT) released their State of California Sea-Level Rise Guidance Document based on the recently published (June 2012) National Research Council (NRC) Sea-Level Rise for the Coasts of California, Oregon, and Washington. Table 3.6-11 summarizes the sea level rise (SLR) projections, including the low and high range values, for the San Francisco Bay area. Further, the CO-CAT guidance recommends that sea level rise values for planning be selected based on risk tolerance and adaptive capacity. See Appendix D-2 for details.

Table 3.6-11
Sea Level Rise Projections for San Francisco, California (NRC 2012 Report)

Time Period	Low (inches)	Projected (inches)	High (inches)
2000-2050	4.5	11.0	23.8
2000-2070	8.4	18.5	38.5
2000-2100	16.5	36.0	66.0

Source: Appendix D-2

The proposed facility is expected to have a top of deck elevation of 11.86 feet NAVD88[3] (11.50 feet MLLW). Based on the flooding elevations discussed previously, there would be 2.36 feet (28 inches) of freeboard initially after construction. This would accommodate all projections of SLR through 2050 shown in Table 3.6-11, and falls midway between the “projected” and “high” estimates of SLR for year 2070 (Appendix D-2).

This impact analysis focuses on the “projected” SLR values. These values have been reasonable guides for policy determinations on recent relevant projects similar to the VMT project component. The interpolation tool provided by the City and County of San Francisco’s SLR Guidance document was used to determine the number of years that 28 inches of freeboard could

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[3] North American Vertical Datum of 1988 – A vertical datum is a surface of zero elevation to which heights of various points are referred in order that those heights be in a consistent system. More broadly, a vertical datum is the entire system of the zero elevation surface and methods of determining heights relative to that surface (NOAA 2015).

theoretically protect from SLR. The anticipated SLR that is estimated for year "t" (years after 2000) can be calculated by:

SLR Projection (most likely, in) = [0.000045t3 +0.00037t2 + 0.428t]/2.54

Based on an initial freeboard of 28 inches, the "t" is calculated as 88 corresponding to year 2088. This provides for 73 years of SLR from the time of preparation of this EIR (Appendix D-2).

The proposed Orcem project component would be located upland from the shoreline and would not be subjected to the effects of SLR. The proposed VMT project component would include construction of a Phase 1 superstructure with a 2-foot-thick deck over 2-foot-deep pile caps. The outer edge of the platform would have a 6.5-foot-deep beam supporting the fender system. Due to their depths, the edge beam and pile caps would both extend below the 100-year water surface elevation, and may be subjected to buoyancy and uplift forces during extreme tidal events. The edge beam would be submerged daily by high tides, and eventually (after SLR occurs) the pile cap would also be submerged daily by high tides (Appendix D-2). The VMT Phase 2 rock dike would not be subject to buoyancy or uplift forces during extreme tidal events, but may become unusable in the event of sea rise levels approaching the 2000–2100 "high-level" projections. Therefore, impacts to the VMT project component related to SLR would be **potentially significant (Impact 3.6-4)**.

3.6.5 Mitigation Measures

Mitigation for Impact 3.6-1: The proposed project would exceed the BAAQMD CEQA level of significance of 10,000 MT CO_2E per year. Unmitigated emissions from the proposed project would be approximately 31,464 MT CO_2E per year.

MM-3.6-1 The following measures are required to be implemented to reduce greenhouse gas (GHG) emissions associated with operation of the proposed project:

- Fuel used in all on-site equipment shall initially consist of 20% biodiesel (a fuel blend of 20% biodiesel in 80% petroleum diesel). As production increases, the biodiesel content of the fuel shall be increased as feasible. The applicants shall conduct annual reviews regarding the availability of technically equivalent or better technologies and report to the City of Vallejo. If the technology is determined to be feasible in terms of cost and technical and operational feasibility, the applicants shall implement such technology.
- Fuel supply shall consist of compressed natural gas for forklifts and front-end loaders.

Mitigation for Impact 3.6-2 and Impact 3.6-3: Although the proposed project would not directly conflict with or obstruct implementation of the City of Vallejo CAP, it cannot be guaranteed that the proposed project would be consistent with the overarching objective of the City's CAP to achieve the reduction targets as established for 2020 and 2035, or the state's target reduction goals in 2030 and 2050.

MM-3.6-2a Orcem and VMT shall encourage employee commute alternatives such as carpooling and biking options by providing information to employees about alternative transportation, providing subsidized bus passes, and including employee showers on site. As part of this effort, Orcem and VMT shall implement an employee worker ridership program to encourage alternative work commute options to reduce single-occupancy vehicle trips during project operation. A commute program manager shall be designated to provide information to employees using the Bay Area Air Quality Management District 511 services (accessed at www.511.org) or a similar Bay Area transit information provider.

The program shall include a provision to notify all future employees of the worker ridership program prior to the start of project operations and shall notify employees of the 511 RideMatch Service (available at https://www.ridematch.511.org/SanFrancisco/TDMRegistration.jsp?idScreen=REGISTRN1), or similar communication method, to ensure personnel can identify potential carpooling program participants. All Orcem and VMT employees shall be encouraged through the program to create an account with 511 (at https://my511.org/) or create an account with a similar transit information provider. Personal accounts will allow employees to log their commute activity, identify rideshare options, use alternative transportation features and trip planning services, and other features to encourage alternative commute methods. Additional resources Orcem and VMT may utilize for the implementation of an alternative commute program can be found at: http://rideshare.511.org/employers/downloads.aspx.

MM-3.6-2b Orcem and VMT shall either eliminate the use of turf in landscaping, or landscape the site with native vegetation and minimize the use of turf, in order to reduce the need for gas-powered lawn and garden equipment.

MM-3.6-2c Orcem and VMT shall use drought-tolerant plant types, where landscaping is proposed, in order to minimize the use of water.

MM-3.6-2d Orcem and VMT shall use greywater, recycled water, and rainwater catchment systems for irrigation, if feasible, for proposed landscape areas. If at least one of these alternative water sources are not employed, Orcem and VMT shall demonstrate infeasibility to the City.

Mitigation for Impact 3.6-4: The VMT project component would be subjected to buoyancy/uplift forces during extreme tidal events, as well as daily or permanent submergence during high tides, as proposed in the project, as a result of projected SLR.

MM-3.6-3 Structural members associated with the VMT deep-water terminal construction, including wharf improvements and other components that would be affected by sea level rise, shall be designed to resist extreme tidal event loads and continual salt water submergence to the satisfaction of the City engineer.

3.6.6 Level of Significance After Mitigation

Impact 3.6-1: Implementation of MM-3.6-1 would require fuel supply measures to reduce GHG emissions associated with operation of the proposed project; however, because the City's adopted CAP does not extend fully to marine and rail operations, there is no assurance that emissions will be reduced to below a level of significance. Impact 3.6-1 would therefore remain **significant and unavoidable**.

Impacts 3.6-2 and 3.6-3: Implementation of MM-3.6-2a through 3.6-2d would require the applicants to encourage employee commute alternatives, and reduce the amount of energy used for landscaping maintenance and irrigation. However, because the City's adopted CAP does not extend fully to marine and rail operations, there is no assurance that emissions will be reduced to a level that would ensure the project would be consistent with the overarching objective of the City's CAP to achieve the reduction targets as established for 2020 and 2035, or the state's target reduction goals in 2030 and 2050. Impacts 3.6-2 and 3.6-3 would therefore remain **significant and unavoidable**.

Impact 3.6-4: Implementation of MM-3.6-3 would require the VMT project component to be designed to resist the effects of SLR to the satisfaction of the City Engineer. Impact 3.6-4 would be reduced to a **less-than-significant** level.

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3.7 HAZARDS AND HAZARDOUS MATERIALS

This section analyzes the potential impacts of the Vallejo Marine Terminal (VMT) and Orcem project (proposed project) with respect to hazards and hazardous materials and recommends mitigation measures where necessary to reduce or avoid significant impacts. Sources reviewed to prepare this section include the following, which are provided in Appendix I:

- **Appendix I-1:** Malcolm Pirnie. 2006. *Site Investigation Report*.
- **Appendix I-2:** Northgate Environmental Management ,Inc. 2006. *Phase I Environmental Site Assessment (ESA).*
- **Appendix I-3:** Northgate Environmental Management Inc. 2007. *Phase II Soil and Groundwater Quality Investigation*.
- **Appendix I-4:** Solano County Department of Resource Management. 2007. *Solano County Remedial Action Completion Certification*. March 2007.
- **Appendix I-5:** Environmental/Remediation Resources Group Inc. 2007. *Final Backfill Report*.
- **Appendix I-6:** Duncklee and Dunham. 2008. *Environmental Audit Summary*.
- **Appendix I-7:** Malcolm Pirnie. 2008. *Fourth Quarter 2007 Groundwater Monitoring Report*.
- **Appendix I-8:** ProTech Consulting and Engineering, 2014. *Asbestos Report*.
- **Appendix I-9:** AWN Consulting, 2014. *Hazards and Hazardous Materials Report for Orcem California Proposed Ground Granulated Blast Furnace Slag Manufacturing Plant.*
- **Appendix I-10:** Malcolm Pirnie. 2013. *Fourth Quarter 2012 Groundwater Monitoring Report, Leasehold Property*.
- **Appendix I-11:** Kennedy/Jenks Consultants. 2014, *Revised Site Management Plan*.

All figures referenced in this section are provided at the end of the section.

3.7.1 Regulatory Setting

Hazardous materials and wastes are identified and defined by federal and state regulations for the purpose of protecting public health and the environment. Hazardous materials contain certain chemical, physical, or infectious properties that cause them to be considered hazardous. Hazardous wastes are defined in the Code of Federal Regulations (CFR) Title 40, Parts 260–265 and in the California Code of Regulations (CCR), Title 22, Section 66261. Over the years, these laws and regulations have evolved to deal with different aspects of the handling, treatment, storage, and disposal of hazardous substances.

Federal

Federal Toxic Substances Control Act and Resource Conservation and Recovery Act (1976)

The Federal Toxic Substances Control Act of 1976 and the Resource Conservation and Recovery Act (RCRA) of 1976 established a program administered by the U.S. Environmental Protection Agency (EPA) for the regulation of the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA was amended in 1984 by the Hazardous and Solid Waste Act, which affirmed and extended the "cradle-to-grave" system of regulating hazardous wastes. The use of certain techniques for the disposal of some hazardous wastes was specifically prohibited by the Hazardous and Solid Waste Act (EPA 2014a).

Hazardous waste generators are regulated based on the amount of hazardous waste produced each month. Large quantity generators are facilities that generate greater than or equal to 1,000 kilograms (kg) of hazardous waste per month; small quantity generators generate between 100 and 1,000 kg of hazardous waste per month; and conditionally exempt small quantity generators generate less than 100 kg of hazardous waste per month and are subject to significantly reduced requirements for managing hazardous waste (EPA 2014b).

Comprehensive Environmental Response, Compensation, and Liability Act (1980)

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as "Superfund," was enacted by Congress on December 11, 1980. This law provided broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. CERCLA established requirements concerning closed and abandoned hazardous waste sites, provided for liability of persons responsible for releases of hazardous waste at these sites, and established a trust fund to provide for cleanup when no responsible party could be identified. CERCLA also enabled the revision of the National Contingency Plan. The National Contingency Plan provided the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants. The National Contingency Plan also established the National Priorities List, which is a list of contaminated sites warranting further investigation by the EPA. CERCLA was amended by the Superfund Amendments and Reauthorization Act in 1986 (EPA 2014b).

Code of Federal Regulations – Title 33: Navigation and Navigable Waters

Title 33 of the CFR governs the navigation of navigable waters as enforced by the U.S. Department of Homeland Security and U.S. Coast Guard. Specifically, Section 165.1181 covers the navigation rules for the San Francisco Bay Region. Given the range of uses within the San

Francisco Bay Region, regulations are in place to ensure safety and security related to commercial, industrial, military, and recreational navigation.

Per 33 CFR 66.01 Aids to Navigation Other Than Federal or State, the U.S. Coast Guard Commander shall be notified no less than 5 days prior to commencing work within navigable waters. Should any federal aids to navigation require removal or relocation in order to implement a project, or should a project require the temporary placement and use of private aids to navigation, a request for removal shall be submitted in writing to the U.S. Army Corps of Engineers (USACE) Regulatory Division as well as the U.S. Coast Guard, Aids to Navigation office. Within 30 days of completion of a project, a post-project survey indicating changes to structures and other features in navigable waters shall be completed and a copy of the survey shall be sent to the USACE Regulatory Division and to the National Oceanic and Atmospheric Administration (NOAA) for chart updating.

Maritime Transportation Security Act of 2002

The Maritime Transportation Security Act of 2002 amends the Merchant Marine Act of 1936 to establish a program to ensure greater security for U.S. ports and waterways. The act, which implements the International Ship and Port Facility Security Code, creates a consistent security program for all U.S. ports. The act requires vessels and port facilities to conduct vulnerability assessments and develop security plans that address security patrols, restricted areas, personnel identification procedures, access control measures, and surveillance equipment.

State

California Oil Spill Prevention and Response Act (1990)

The goal of the Oil Spill Prevention and Response Act is to improve the prevention, removal, abatement, response, containment, clean up, and mitigation of oil spills in the marine waters of California. The Oil Spill Prevention and Response Act and its implementing regulations (14 CCR 800–802) created harbor safety committees for the major harbors of California to plan for the safe navigation and operation of tankers, barges, and other vessels within each harbor by preparing a harbor safety plan encompassing all vessel traffic within the harbor.

California Environmental Protection Agency

The California Environmental Protection Agency (CalEPA) implements and enforces a statewide hazardous materials program established by Senate Bill 1802 to consolidate, coordinate, and make consistent the administrative requirements, permits, inspections, and enforcement activities for the following environmental and emergency management programs for hazardous materials:

- Hazardous Materials Release Response Plans and Inventories (Business Plans)
- California Accidental Release Prevention Program

- Underground Storage Tank Program
- Aboveground Petroleum Storage Act Requirements for Spill Prevention, Control, and Countermeasure Plans
- Hazardous Waste Generator and On-Site Hazardous Waste Treatment Programs
- California Uniform Fire Code, Hazardous Materials Management Plans, and Hazardous Material Inventory Statements

California Hazardous Waste Control Law

The California Hazardous Waste Control Law is administered by CalEPA to regulate hazardous wastes. While the Hazardous Waste Control Law is generally more stringent than the RCRA, until the EPA approves the California hazardous waste control program (which is charged with regulating the generation, treatment, storage, and disposal of hazardous waste), both the state and federal laws apply in California. The Hazardous Waste Control Law lists 791 chemicals and approximately 300 common materials that may be hazardous; establishes criteria for identifying, packaging, and labeling hazardous wastes; prescribes management controls; establishes permit requirements for treatment, storage, disposal, and transportation; and identifies some wastes that cannot be disposed of in landfills.

CCR, Title 22, Section 66261.10, provides the following definition for hazardous waste:

> [A] waste that exhibits the characteristics may: (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported, or disposed or otherwise managed.

According to CCR Title 22, substances having a characteristic of toxicity, ignitability, corrosivity, or reactivity are considered hazardous waste. Hazardous wastes are hazardous substances that no longer have a practical use, such as material that has been abandoned, discarded, spilled, contaminated, or is being stored prior to proper disposal.

Toxic substances may cause short-term or long-lasting health effects, ranging from temporary effects to permanent disability or death. For example, toxic substances can cause eye or skin irritation, disorientation, headache, nausea, allergic reactions, acute poisoning, chronic illness, or other adverse health effects if human exposure exceeds certain levels (the level depends on the substance involved). Carcinogens (substances known to cause cancer) are a special class of toxic substances. Examples of toxic substances include most heavy metals, pesticides, and benzene (a carcinogenic component of gasoline). Ignitable substances (e.g., gasoline, hexane, and natural gas) are hazardous because of their flammable properties. Corrosive substances (e.g., strong acids and bases such as sulfuric (battery) acid or lye) are chemically active and can damage other materials or cause severe burns upon contact. Reactive substances (e.g., explosives, pressurized canisters, and pure sodium metal, which react violently with water) may cause explosions or generate gases or fumes.

Other types of hazardous materials include radioactive and biohazardous materials. Radioactive materials and wastes contain radioisotopes, which are atoms with unstable nuclei that emit ionizing radiation to increase their stability. Radioactive waste mixed with chemical hazardous waste is referred to as "mixed wastes." Biohazardous materials and wastes include anything derived from living organisms. They may be contaminated with disease-causing agents, such as bacteria or viruses (22 CCR 66261.1 et seq.).

California Accidental Release Prevention Program

Similar to the Federal Risk Management Program, the California Accidental Release Prevention Program includes additional state requirements as well as an additional list of regulated substances and thresholds. The regulations of the program are contained in CCR Title 19, Division 2, Chapter 4.5. The intent of the California Accidental Release Prevention Program is to provide first responders with basic information necessary to prevent or mitigate damage to public health, safety, and the environment from the release or threatened release of hazardous materials.

California Department of Toxic Substances Control

The California Department of Toxic Substances Control (DTSC) administers the transportation of hazardous materials throughout the state. Regulations applicable to the transportation of hazardous waste include Title 22, Division 4.5, Chapter 13 and Chapter 29 of the CCR and Division 20, Chapter 6.5, Articles 6.5, 6.6, and 13 of the California Health and Safety Code (California DTSC 2007). The California DTSC requires that drivers transporting hazardous wastes obtain a certificate of driver training that shows the driver has met the minimum requirements concerning the transport of hazardous materials, including proper labeling and marking procedures, loading/handling processes, incident reporting and emergency procedures, and appropriate driving and parking rules.

California Health and Safety Code

In California, the handling and storage of hazardous materials is regulated by Division 20, Chapter 6.95 of the California Health and Safety Code. Under Sections 25500–25543.3, facilities handling hazardous materials are required to prepare a Hazardous Materials Business Plan. Hazardous Materials Business Plans contain basic information on the location, type, quantity, and health risks of hazardous materials stored, used, or disposed of in the state.

Chapter 6.95 of the Health and Safety Code establishes minimum statewide standards for Hazardous Materials Business Plans. Each business shall prepare a Hazardous Materials Business Plan if that business uses, handles, or stores a hazardous material (including hazardous waste) or an extremely hazardous material in quantities greater than or equal to the following:

- 500 pounds of a solid substance
- 55 gallons of a liquid
- 200 cubic feet of compressed gas
- A hazardous compressed gas in any amount (highly toxic with a Threshold Limit Value of 10 parts per million or less)
- Extremely hazardous substances in threshold planning quantities

In addition, in the event that a facility stores quantities of specific acutely hazardous materials above the thresholds set forth by California law, facilities are also required to prepare a Risk Management Plan and California Accidental Release Plan. The Risk Management Plan and Accidental Release Plan provide information on the potential impact zone of a worst-case release and require plans and programs designed to minimize the probability of a release and mitigate potential impacts.

California Occupational Safety and Health Administration

The California Occupational Safety and Health Administration is the primary agency responsible for worker safety in the handling and use of chemicals in the work place. California Occupational Safety and Health Administration standards are generally more stringent than federal regulations. The employer is required to monitor worker exposure to listed hazardous substances and notify workers of exposure (8 CCR 337 et seq.). The regulations specify requirements for employee training, availability of safety equipment, accident prevention programs, and hazardous substance exposure warnings.

Local

Solano County Department of Resource Management, Environmental Health Services Division

The Solano County Department of Resource Management, Environmental Health Services Division is the Certified Unified Program Agency (CUPA) for all cities and unincorporated areas in Solano County. The CUPA is responsible for regulating hazardous materials business plans and chemical inventory, hazardous waste permitting, underground storage tanks (USTs), and risk management plans, including the Solano County Hazardous Material Area Plan (Solano County 2014). The Hazardous Material Area Plan describes the County's planning and preparedness for hazardous materials releases, clarifies the role of various agencies during a hazardous materials incident, and describes the County's hazardous materials incident response program, training, communications, and post-incident recovery procedures (Solano County 2014).

San Francisco Bay Conservation and Development Commission

The San Francisco Bay Conservation and Development Commission (BCDC) oversees and regulates any dredging and disposal activities in the San Francisco Bay and associated water bodies, including the Mare Island Strait.

San Francisco, San Pablo, and Suisun Bays Harbor Safety Plan

The San Francisco, San Pablo, and Suisun Bays Harbor Safety Plan, approved in June 2013, is intended to provide mariners with a guide to navigation issues and vessel safety to ultimately prevent pollution and protect the region's valuable resources. The plan was developed by the Harbor Safety Committee of the San Francisco Bay Region as required by the California Oil Spill Prevention and Response Act of 1990. The Harbor Safety Plan includes Best Maritime Practices which provide important information necessary for safe, reliable and environmentally sound vessel movements in and around San Francisco Bay, including speed restrictions, navigation guidelines, and traffic routing protocols (HSC 2013).

The San Francisco Harbor Safety Committee consists of representatives from the following: ports, dry cargo vessel operators, tank ship operators, oil marine terminal operators, tug operators, tank barge operators, passenger ferry or excursion vessel operators, the regional pilot organization, the vessel labor union, commercial fishing representatives, recreational boaters, environmental organizations, the U.S. Coast Guard Captain of the Port, USACE, NOAA, and the San Francisco BCDC (HSC 2013).

San Francisco Bay Area Water Emergency Transportation Authority's Plans

The Water Emergency Transportation Authority replaced the San Francisco Bay Area Water Transit Authority, which was a regional agency authorized by the State of California to operate a comprehensive San Francisco Bay Area public water transit system. In 2003, the Water Transit Authority issued a Final Implementation and Operations Plan, which provides a strategy to improve public transit with an environmentally friendly ferry system. In 2009, the Water Emergency Transportation Authority adopted the Emergency Water Transportation System Management Plan, which complements and reinforces other transportation emergency plans that will enable the Bay Area to restore mobility after a regional disaster (WETA 2009).

3.7.2 Existing Conditions

Existing and past land use activities are potential indicators of hazardous material storage and use. For example, many industrial sites, historic and current, are known to have soil or groundwater contamination by hazardous substances. Other hazardous materials sources include leaking underground storage tanks, surface runoff from contaminated sites, and migration of contaminated groundwater plumes.

Setting

The project site consists of a 39.1-acre site located along Derr Avenue in Vallejo, California. The majority of the project site consists of the former General Mills flour mill plant which operated at the site from 1869 until 2004. The former flour mill plant is currently unoccupied and consists of 12 structures associated with the former flour mill plant operations, along with a single residence and associated accessory buildings. The former flour mill plant site has been the subject of prior environmental investigations, some of which were divided into two different areas: the eastern portion is referred to as the Fee Property and the western portion along the waterfront is referred to as the Leasehold area. As shown on Figure 3.7-1, the VMT Site and the Orcem Site both include portions of the Fee Property and the Leasehold areas.

The approximately 5-acre plot of vacant land east of Derr Avenue in the northern portion of the project site (outside of the VMT Terminal and Orcem Sites) appears to have been historically vacant (based on review of aerial photographs from 1948, 1968, 980, 1987, 1988, 1993, 2002, and 2005 on www.historicaerials.com). Dudek did not review any prior investigations that covered the approximately 5-acre vacant area.

The project site is bordered to the east and southeast by residential development. An industrial and rail area are located to the north, and Mare Island Strait lies to the west of the project site.

Many types of marine vessels call at terminals in the Bay Area. 2010 is the most recent year of available data and is generally representative of the baseline conditions for the proposed project. Annually, approximately 3,195 commercial vessels transit into Carquinez Bay, however, very few of these vessels actually transit through Mare Island Straits (Pinhey, pers. comm. 2014; USCG 2014)

Groundwater has been measured at between 3.8 to 5.9 feet below ground surface (Appendix I-1). The site is predominantly underlain by artificial fills thought to have been derived from the adjacent hillside. Geology, soils and topography on site are described in detail in Section 3.5, and shown in Figure 3.5-1.

Surface water is present in the western portion of the project site as part of the Mare Island Strait. Mare Island Strait receives flow from the Napa River and discharges to San Pablo Bay. Surface water and groundwater features are described in detail in Section 3.8. Several industrial facilities have flanked Mare Island Strait, including the Mare Island Naval Shipyard, Kaiser Steel, and the PG&E Manufactured Gas Plant. Some industrial sites located along the Mare Island Strait, including Mare Island Naval Shipyard, have discharged wastewater to the strait.

Limited sediment sampling data for Mare Island Strait were identified in past studies. The data included a 1988–1990 study by NOAA and dredged material sampling from 2005. Dudek reviewed a report estimating the extent and magnitude of adverse biological effects associated with chemical contaminants throughout the San Francisco Bay estuary, which included Mare Island Strait. Reportedly, concentrations of silver, chromium, and lead were detected, and the majority of the sediment samples from Mare Island Strait were found to be toxic to bivalve larvae (NOAA 1992). Table 3.8-3 in Section 3.8 provides water quality monitoring results in the Mare Island Strait for selected contaminants.

Dudek also reviewed an Environmental Impact Report (EIR) for the Mare Island dredged material disposal ponds at the Former Mare Island Naval Shipyard. Dredged material from Mare Island Strait was discharged to the ponds between 1982 and 1994. The dredged material in the ponds were allowed to settle before the excess water was discharged in tidal wetlands, and when capacity was met, the ponds were left to dry. As part of remedial investigations at the Naval Shipyard, subsurface sediments from the disposal ponds and dredged material from the levees in Mare Island Strait were collected (City of Vallejo and USACE 2005). The data is presented in Table 3.7-1.

Table 3.7-1
Subsurface Sediments in Mare Island Strait

	Screening Guidelines for Beneficial Reuse, (mg/kg)		**Dredged Material 50th Percentile**	**Dredged Material Upper 99th Percentile**
	Surface Wetlands	*Upland fill or wetland foundation soils*		
Inorganic Elements (mg/kg)				
Arsenic	15.3	70	15	37.9
Chromium	112	370	94	217
Lead	43.2	218	39	292
Silver	0.58	3.7	0.54	3.7
Zinc	158	410	156	595
Organic Compounds (mg/kg)				
Total PAH	**3.39**	**44.8**	**0.1**	**0.8**
Total PCBs	**0.023**	**0.18**	**0.03**	**0.5**

Notes:
mg/kg= milligrams per kilogram.
PAH = polycyclic aromatic hydrocarbon
PCB = polychlorinated biphenyls

Based on the historic concentrations detected in the sediment from Mare Island Strait, current sediment in the Mare Island Strait may have elevated concentration of contaminants. Sediment screening and testing guidelines for beneficial reuse of dredged materials indicate up to 50% of the samples measured would not be suitable for reuse as wetland surface material. The samples measured would pass most criteria for reuse as upland fill or wetland foundation material, although some concentrations of lead, silver, zinc and total polychlorinated biphenyls (PCBs) indicate reuse even as upland or foundational material may not be permitted. It should also be noted that it is unknown whether the statistics in Table 3.7-1, while in fairly close proximity to the project, are representative of the tidal sediments within the project site specifically.

Prior Investigations

Prior investigations of the former General Mills flour mill occurred between 1987 and 2014. The prior investigations were associated with investigation and remediation/closure of 13 underground storage tanks (USTs), 7 aboveground storage tanks (ASTs), and other industrial uses (machine shop, print shop, garage, dumping area, fumigant storage) at the site. Ten of the former USTs were located on the Fee Property (eastern portion of the General Mills site), and three of the former USTs were located on the Leasehold (western portion of the General Mills site). A large soil excavation occurred on the Leasehold property in 2006. The large soil excavation area was investigated further, and land use restrictions were placed on the former excavation area, now referred to as the Site Management Plan (SMP) area and buffer, in 2014. The locations of the former USTs and ASTs, the locations of the Fee Property and Leasehold, and the location of the large soil excavation (included within the SMP area and buffer) are shown on Figure 3.7-1.

2006 Site Investigation Report

Malcolm Pirnie conducted site investigation work during January and February of 2006 (see Appendix I-1), including the installation of five groundwater monitoring wells and one geotechnical boring as well as the removal of five USTs (eight USTs had been previously removed or closed). Soil testing and subsurface investigation was performed in the locations of the 13 former USTs and 7 former ASTs at the site as well as other areas to determine the extent to which petroleum hydrocarbons were present.

Malcolm Pirnie proposed site-specific remediation goals to the Solano County Resource Management Environmental Health Division. The remediation goals for the eastern portion of the site (Fee Property) were based on a residential use scenario, while the goals for the western portion of the site (Leasehold) were based on a commercial end use.

Remediation efforts included excavation, on-site ex-situ chemical oxidation treatment, and reuse (backfill) of the treated soil. Remediation activities were located in the areas associated with the

USTs, ASTs, machine shop, print shop, fill material and fumigant use and storage. Five USTs were identified through record review and were removed. The large excavation area in the Leasehold property area is discussed further in the 2007 ERRG Final Backfill Report (Appendix I-5).

The 2006 Site Investigation Report (Appendix I-1) referenced 2005 Phase I and II ESAs by Clayton Group Services. The soil boring investigations by Clayton Group Services in 2005 had detected total petroleum hydrocarbons (TPH)-diesel in groundwater at up to 220,000 micrograms per liter (μg/L); TPH-gas was detected at up to 370 μg/L; and TPH-motor oil was detected at up 89,000 μg/L in the vicinity of the future excavation area.

During the 2006 soil boring investigation by Malcolm Pirnie on the leasehold portion of the project site in the vicinity of the future large excavation area, PCE was detected at 0.18 milligrams per kilogram (mg/kg), vanadium at 280 mg/kg, and lead at 180 mg/kg. TPH-gas was detected at up to 860 mg/kg and TPH-diesel was detected at up to 53,000 mg/kg in soil. TPH was detected in groundwater at concentrations ranging from 9,100 μg/L) to 34,000 ug/L. 2-butanone was detected at 3.7 μg/L. Soil in the area of these samples was excavated and remediated in 2006, as discussed in the 2007 ERRG Final Backfill Report section later in this analysis.

Confirmation sampling was conducted by Malcolm Pirnie after the UST removal activities with concentrations of TPH-diesel detected at up to 1,800 mg/kg, TPH-gas at up to 100 mg/kg, and TPH-motor oil at up to 580 mg/kg.

2006 Phase I Environmental Site Assessment

A Phase I Environmental Site Assessment (ESA) was prepared in accordance with American Society for Testing and Materials (ASTM) Standard E-1527-05 in 2006 by Northgate (Appendix I-2). The Phase I ESA indicates that the project site was used as a flour mill from 1869 until 2004. The project site was described as occupied by an old flour mill, two warehouses, other structures associated with the processing and storage of flour and flour products, a plant residence, and other associated structures; ten buildings in total. A single residence with garage, barn, and chicken coop was located on the project site. The Phase I ESA indicated the potential for petroleum hydrocarbons to be present in shallow soils and groundwater due to the former presence of USTs and ASTs on the site. The subject property has undergone remediation and monitoring associated with the removal of 13 USTs. Five groundwater wells had been constructed on the subject property.

Northgate commissioned an agency database search, which indicated that the project site was listed in nine regulatory databases with entries relating to former fuel storage and emissions. A review of off-site sources listed within the report did not show any likely impacts to the project site from off-site sources.

Additionally, Northgate conducted file reviews at several local/regional agencies as well as on site. These file reviews yielded permits for demolition, permits for building, permits for electrical, permits for roofing, permits for UST removal, code enforcement, fire inspection reports, sprinkler checks, UST and AST installation permits, hazardous materials inventories, fumigation notices, fire incident report, investigation and remediation reports, work plans, particulate emissions documents, and hazardous waste manifests. Hazardous waste manifests were for waste oil, mineral oil, cleaning solutions, and PCB light ballasts. Fumigation and chemical storage records indicated the following fumigants were stored and/or used at the site: phostoxin, magnesium phosphide, and methyl bromide.

As part of this investigation, Northgate also reviewed several previous environmental reports for the subject site. Based on this research, the Northgate Phase I ESA identified 13 USTs and 7 ASTs that had been located on the project site, as well as other potential sources of release. The assessment further concluded that the chemicals used at the site were mostly petroleum hydrocarbons in the form of fuel, lubricants, and machine oils, but also included printing materials, bleaching agents, organic solvents and fumigants. The assessment also noted that 12 of the 13 USTs were removed, and the thirteenth tank was closed in place. The Phase I ESA noted that investigation and remediation of USTs and ASTs had occurred over a period of some decades but the potential for materials containing petroleum hydrocarbons to remain at the project site persisted. Additional issues identified during the Phase I ESA included potential impacts from the machine shops and fumigants and detections of arsenic on the project site. Furthermore, the Phase I ESA noted that the proposed demolition of existing structures on the project site may involve the removal of hazardous building materials.

2007 Phase II Soil and Groundwater Quality Investigation Report

Northgate conducted a Phase II soil and groundwater quality investigation (Appendix I-3) at the project site in December 2006 to evaluate the former machine shop, former print shop and dump/debris area near the former wharf. Soil and groundwater samples were collected from 11 soil borings.

TPH-diesel results ranged from non-detect to 34 mg/kg. TPH-motor oil soil sampling results ranged from non-detect to 330 mg/kg. Cis-1,2-dichloroethylene was detected in groundwater at 0.87 μg/L. Arsenic soil sampling results ranged from 1.6 to 23 mg/kg.

The report concluded that conditions at the areas investigated did not exceed the site-specific environmental screening levels.

2007 Solano County Remedial Action Completion Certification

In March 2007 the Solano County Department of Resource Management (County) issued a letter acknowledging completion of corrective action for the eastern portion of the site (Fee Property) and stating no further action relating to the release of petroleum at that portion of the project site is required (Appendix I-4). The closure letter noted that groundwater at the Fee Property site should not be used without prior concurrence from the County. Additionally, the County noted that precautions should be taken during site construction to appropriately handle impacted soil and avoid groundwater. The closure letter noted that approximately 500 cubic yards of soil were removed during removal of 3 USTs from the Fee Property in 2006. An unknown quantity of soil was removed during removal of 7 other USTs from the Fee Property. The locations of the former USTs and known associated clean-up areas are shown on Figure 3.7-2.

The Fee Property site concentrations in Table 3.7-2 were included in the closure letter, before and after remediation.

Table 3.7-2
Maximum Documented Soil Concentrations – Before and After Cleanup

Constituent	Initial Concentration (mg/kg)	Residual Concentration (mg/kg)
TPH-gas	300	<1
TPH-diesel	3,900	94
TPH-motor oil	7,500	280
Benzene	0.011	<0.005
Tetrachloroethylene	64	<2
Trichloroethylene	42	<2
Lead	170	61
Arsenic	19	25
Vanadium	91	95

2007 Final Backfill Report

The 2007 Final Backfill Report (Appendix I-5) prepared by ERRG details the large excavation in the Leasehold area (located within the SMP area and buffer shown on Figure 3.7-1). The excavation area was approximately 30,000 square feet at the ground surface. The upper 5 feet of soil (approximately 5,000 cubic yards) from the excavation were determined to be overburden and were stockpiled and later used for backfill. The excavation extended to 18 feet below ground surface at the deepest area. More than 1,000,000 gallons of groundwater were extracted from the pit for treatment and discharge.

Approximately 9,000 cubic yards of petroleum hydrocarbon-impacted soil were excavated, treated on site using chemical oxidation, and used to backfill the excavation. A 1-foot cap of clean imported soil was placed on top of the backfilled site soil to bring the excavation to grade.

2008 Environmental Audit Summary Report

Duncklee & Dunham, P.C. performed an environmental audit of the former General Mills flour mill in 2008 (Appendix I-6). The audit noted the following information about the 13 former site USTs.

- The USTs included:
    - Four diesel fuel tanks 1,000 – 5,000 gallons in size (removed 1987–1988)
    - One waste oil tank (250 gallons, removed in 1988)
    - Two heating oil tanks 250 – 32,000 gallons in size (one removed in 1988 and one closed in place)
    - Two 100-gallon fuel oil tanks (removed in 2006)
    - Three gasoline tanks 280 – 10,000 gallons in size (removed in 2006)
    - One 1,000-gallon tank (either gasoline or diesel, removed in 1988)

The audit noted that due to the presence of arsenic (naturally occurring), engineering controls may be needed for residential development.

2012 Groundwater Monitoring Report

A February 2013 groundwater monitoring report for the fourth quarter 2012 by Malcolm Pirnie (Appendix I-10) describes monitoring activities over the prior 5-year period on the Leasehold portion of the project site. A request for No Further Action is made in the report. The report references a 2007 Groundwater Monitoring Plan which establishes nuisance conditions and site-specific environmental screening levels (ESL) as the water quality objectives. Fifteen quarterly groundwater monitoring events had been conducted at the time the 2013 report was submitted.

Fifteen groundwater samples were collected across the Leasehold portion of the project site and three samples were collected within the former excavation limits. One sample detected TPH-diesel at 290 µg/L within the former large excavation area. All other samples were below the detection or reporting limit.

2014 Revised Site Management Plan

A 2014 Site Management Plan (Appendix I-11) discussed the management of soil and groundwater in the immediate vicinity of the 2006 large excavation area on the Leasehold property. The plan noted that residual soils remain with TPH and polycyclic aromatic hydrocarbons (PAHs). The plan noted that the objective of the 2006 excavation was to remove soils impacted with TPH at concentrations greater than the site-specific remediation levels developed at that time. However, those site-specific remediation levels were higher than the Regional Water Quality Control Board (RWQCB) ESL and are therefore considered unacceptable for unrestricted land use. Therefore, the Site Management Plan lists site activity and use restrictions for the portion of the Leasehold property in the immediate vicinity of the former excavation area. The plan stated that monument markers would be placed around the former excavation area to note the area to not be disturbed. The plan notes restrictions for any future excavation and dewatering work in this area of the site. The plan also notes requirements for maintaining a soil cap over this area. Lastly, the plan notes that new buildings in this area shall include vapor intrusion mitigation measures. This restricted area and associated buffer are referred to as the SMP Area and Buffer on Figure 3.7-1.

2014 Asbestos Report

In March of 2014, Protech conducted a survey, sampling and analysis of building materials to characterize asbestos for demolition and confirmed its presence on the project site (Appendix I-8). Asbestos-containing materials (ACMs) were found in roofing material, flooring, and exterior and interior walls in the silo building, mill building, bulkhouse building, and warehouse/loading building. No suspect ACMs were identified in the outbuildings located south of the mill building.

3.7.3 Thresholds of Significance

The following criteria, included in Appendix G of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.), will be used to determine the significance of potential hazards and hazardous materials impacts. Impacts to hazards and hazardous materials would be significant if the proposed project would:

A) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;

B) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;

C) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;

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

E) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

3.7.4 Impact Discussion

A) Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

VMT and Orcem Project Analysis

Construction Impacts

<u>Hazardous Materials Use During Construction</u>

It is anticipated that construction of the proposed project would require the temporary use of hazardous materials, such as diesel fuels, lubricants, solvents, and asphalt during construction activities. The proposed project would be required to comply with all applicable requirements of the Solano County Department of Resource Management, Environmental Health Services Division, as well as federal, state, and local laws and regulations pertaining to the handling, storage, transport, disposal, and use of such materials. For example, if the amount of fuel stored on site exceeds 1,320 gallons, the applicant will be required to prepare and implement a Spill Prevention, Control, and Countermeasure plan. Furthermore, the best management practices for the purpose of stormwater pollution prevention discussed in Section 3.8, Hydrology and Water Quality (Criterion A), would include measures to prevent the release of hazardous materials used in construction activities. Adherence to the construction specifications and applicable regulations regarding hazardous materials and hazardous waste, including disposal, would reduce impacts during construction of the proposed project. However, impacts would be **significant (Impact 3.7-1)**, and mitigation is provided in Section 3.7.5.

<u>Dredging During Construction</u>

Based on the limited historic sediment sampling data readily available for Mare Island Strait (as discussed in Section 3.7.2, Setting), current sediment in the Mare Island Strait may have elevated concentration of metals contaminants. The proposed dredging activities would be required to adhere to San Francisco BCDC and the Dredged Material Management Office requirements, including obtaining a BCDC permit and submitting a sediment quality sampling plan. The dredging activities would also be required to adhere to applicable California Department of Fish and Wildlife requirements under Fish and Game Code

Sections 1601 and 1603. Transportation and/or disposal of the potentially contaminated dredged material as fill material could result in a **significant** impact **(Impact 3.7-2)**. The impacts related to reuse of dredged materials and on-site processing and reuse of demolition debris (riprap and Class II aggregate) for engineered fill are discussed in greater detail in Section 3.3.4 (which specifically addresses impacts to aquatic resources) and Section 3.8.4 (which discusses how such activities might violate water quality standards).

Hazardous Building Materials During Demolition

As described in Existing Conditions, ACMs were found in several buildings within the project site, which would be demolished during construction of the proposed project. ACMs were identified in roofing material, flooring, and exterior and interior walls in the silo building, mill building, bulkhouse building, and warehouse/loading building (see Appendix I-8). In addition to ACMs, the following hazardous materials may also be present in the buildings that would be demolished: lead-based paints, PCB-containing equipment, mercury-containing equipment, mold growth, and chemical supplies. The proposed project also includes recycling of some building materials for use as engineered fill material. Disposal and/or transport of these materials during construction could result in a **significant** impact **(Impact 3.7-3)**, and mitigation is provided in Section 3.7.5.

Hazardous Materials During On-Shore Excavation and Grading

Based on prior investigation and remediation reporting described in Existing Conditions, it is likely that residual concentrations of petroleum hydrocarbons, PAHs, fumigants, volatile organic compounds, and metals remain at the project site. It is possible that unknown features, such as additional USTs, underground pipelines, or other unknown impacts, are also present at the project site.

Based on the 2014 SMP for a portion of the Leasehold area (located in both the VMT and Orcem Sites), prior site remediation levels were found to be insufficient for unrestricted use by the County (Appendix I-11). Based on historical remediation activities (which placed a 1-foot cap of clean soils over a contaminated area on the VMT Site), groundwater monitoring data, and the County-approved 2007 exposure assessment, the area does not pose a significant human health or environmental risk under the restricted land use (which allows only industrial and certain commercial land uses and prohibits groundwater supply wells). However, there is a potential for construction workers installing foundations or underground utilities (which in the affected area of the VMT Site would be the storm drain system), to become exposed to residual contaminants.

The 2014 Site Management Plan (Appendix I-11) outlines existing activity and use restrictions for the site. It describes procedures to be followed when conducting subsurface construction activities below a depth of 1 foot in the SMP area, or below a depth of 5 feet in the buffer zone. The SMP area and buffer are shown on Figure 3.7-1, and identified on site by 1-foot by 1-foot flush-mounted concrete monuments with brass markers. The SMP requires excavations below these depths to comply with specific procedures for loading and transportation of soil; construction equipment decontamination; soil stockpile management; soil reuse, recycling, treatment, and/or disposal guidelines; restrictions on the reuse of impacted site soils; and requirements for handling shallow groundwater from construction dewatering activities. Vapor intrusion mitigation is required for buildings in a portion of the Leasehold property. The SMP also outlines recordkeeping, inspection procedures, and reporting requirements to ensure compliance with the SMP. Because the SMP is an attachment to the property's land use covenant, the procedures and requirements are mandatory and thus are considered to be part of the proposed project.

The SMP only covers the portion of the VMT Site shown in Figure 3.7-1 (labeled SMP Area and Buffer), and there is the potential for contaminated soils or groundwater to be encountered by workers during excavation and grading in other parts of the project site. Therefore, impacts would be **significant (Impact 3.7-4)**, and mitigation is provided in Section 3.7.5.

Operational Impacts

VMT Project Component

The VMT project component would primarily service dry bulk and break-bulk cargos. Liquid bulk cargos or large-scale container operations are not envisioned to be handled through the VMT Terminal. While the primary focus of VMT operations would be aggregates, the terminal would be designed to include both shipping and receiving of a wide range of products through the Phase 1 wharf and Phase 2 rock dike, including loading and unloading of larger vessels through the Phase 1 wharf, along with a combination of barge and other smaller vessels through the Phase 2 rock dike. With the exception of cargos that do not release fugitive dust or airborne/soluble toxic materials when handled in the open, all cargo received or shipped through the VMT Terminal will be handled through enclosed transport devices (for example, the granulated blast furnace slag (GBFS) material received and transported directly to the Orcem Site). In addition, dry soils will be wetted during loading operations, and any construction vehicles or equipment that may come in contact with potentially impacted materials shall be decontaminated prior to leaving the site. Please refer to Section 3.2, Air Quality, for an analysis of air quality impacts and a discussion of how such impacts would be minimized. The VMT terminal will include fueling stations for mobile equipment and associated spillage protection systems, which will require periodic replenishment.

The State of California's hazardous waste regulation, the RCRA, and other applicable waste management regulations have requirements and procedures for the handling of hazardous and regulated wastes. The regulations regarding disposal of wastes to land are overseen by the

California Department of Toxics Substances Control and the RWQCB. Generators of waste resulting from site activities shall be responsible for characterizing the waste according to federal regulations (41 CFR 261), California regulations (CCR Title 22), and local requirements. Non-hazardous wastes that contain site contaminants of concern may be recycled, at the discretion of the recycler, or disposed of at an accepting licensed disposal facility. Hazardous wastes, if encountered, must be disposed at a permitted facility in accordance with state and federal regulations. On-site treatment is not acceptable for impacted soils unless it is approved by the County or RWQCB, and appropriately permitted.

As such, impacts related to the potential transport, use, or disposal of hazardous materials during operation of the VMT project component would be **less than significant**.

Orcem Project Component

Once operational, the Orcem project component would produce ground granulated blast furnace slag (GGBFS) on site, via the following major steps:

1. Receive via several alternative transport modes, various raw materials, including, GBFS, clinker, Portland cement clinker, pozzolan, gypsum, and limestone.
2. Store the GBFS, clinker, Portland cement clinker, pozzolan, gypsum, and limestone on the site.
3. Process, by milling within a closed system, the GBFS granulate and gypsum into GGBFS powder, and all the materials into a variety of hydraulic cements.
4. Store the GGBFS and cement products within enclosed storage facilities on the site.
5. Distribute the GGBFS and cement from the enclosed storage facilities on the site for use in construction projects throughout California and neighboring states.

GBFS, the raw material used in the process, is the principal material which would be stored, used and processed on the Orcem Site. GBFS has a low solubility in water and has an inherent free moisture content, from 8% to 12%. The glassy nature of the granules and the moisture of the GBFS minimize the dust created in either handling or storage. It is nonflammable, nontoxic and nonexplosive. Laboratory analysis of a GBFS sample, undertaken by Weck Laboratories, California, is provided as Attachment A of the Orcem Hazards and Hazardous Materials Report (Appendix I-9).

The finished product GGBFS is finely ground GBFS, sometimes with minor additions to enhance performance. GGBFS, as a finely ground powder, is capable of emitting fugitive dust particles if not properly contained within closed processing, storage and loading facilities. Other materials which may be used on site include limestone, pozzolan rock, and gypsum. Materials safety data sheets (MSDS) for each of these materials are provided as attachments to the Orcem Hazards and Hazardous Materials Report (Appendix I-9).

- *Limestone,* a natural rock (composed mainly of calcium carbonate) which is mined and crushed for use as an aggregate in the construction industry, maybe be used on site in small quantities. Limestone is classified as nonhazardous substance. The MSDS notes that limestone may produce a nuisance dust, which does not have health impacts for workers provided it is kept below occupational exposure limits.
- *Pozzolan Rock* is a naturally occurring material derived from volcanic rock and ash deposits, used as an additive in small quantities to improve the performance of cement. Pozzolan is classified as nonhazardous substance. The MSDS for pozzolan notes that it contains crystalline silica, which may produce silicosis in susceptible persons. Crystalline silica is also listed as a human carcinogen.
- *Gypsum* is a natural material (composed of calcium sulphate) which is mined and processed for use in the construction industry. Gypsum is classified as nonhazardous substance. The MSDS notes that gypsum may produce a nuisance dust, which does not have health impacts for workers provided it is kept below occupational exposure limits.

The production plant may also process clinker only, depending on market and economic conditions. Portland cement clinker is a common construction material manufactured by blending materials including limestone, shale and clay in a kiln and processing at temperatures in excess of 1800° Fahrenheit (°F). Portland cement clinker is classified as a hazardous substance. The MSDS for Portland cement clinker notes that it contains crystalline silica, which may cause silicosis in susceptible persons. It also notes that crystalline silica is listed as a human carcinogen. Review of the analytical laboratory report for the Portland cement sample indicates the presence of hexavalent chromium in the sample at a concentration of 16 mg/kg (Appendix I-9). Hexavalent chromium is a human carcinogen. The hexavalent chromium content in cement varies based on the raw materials used, the grinding process, and the kiln conditions, among other factors (NIOSH 2013). Worker airborne and dermal exposure to hexavalent chromium shall be limited to levels below the California Occupational Safety and Health Administration (OSHA) permissible exposure limits PEL using engineering controls and monitoring. The project is designed to utilize engineering controls most likely to reduce employee exposure to airborne hexavalent chromium such as local exhaust ventilation, process enclosure, process modification, and improved general dilution ventilation (NIOSH 2013).

The proposed milling process, whether undertaken for GGBFS or portland cement clinker, would be carried out in a closed circuit system under negative pressure (no outlet to the exterior, except through high performance filters). Likewise, fully sealed finished product storage in silos would be provided. Facility operations will require permit from the Bay Area Air Quality Management

District (BAAQMD), as discussed in Section 3.2, as well as mitigation for air quality that would reduce the potential for fugitive emissions and toxic air contaminants (including hexavalent chromium) from the Orcem facility.

Lubricants, oils, and greases, common in any manufacturing or industrial facility, would also be stored and used on-site in small quantities. All liquids of this nature would be stored on spill pallets and would have associated drip trays to catch and retain any drips during use. These materials would be stored in very small quantities, in individual packaged containers received from suppliers. If the quantity of fuel/oil storage on the project site is greater than 55 gallons in one container during operation, a Hazardous Materials Business Plan (HMBP) must be prepared, pursuant to Chapter 6.95, Division 20 of the California Health and Safety Code. The completed HMBP would be submitted to the CUPA (i.e., the Solano County Department of Resource Management, Environmental Health Services Division) via the California Environmental Reporting System.

Compliance with laws and regulations governing hazardous waste (see Section 3.7.1), BAAQMD and BCDC permits, local requirements, and implementation of the mitigation measures in Section 3.7.6 would ensure the impacts of routine transport, use, or disposal of hazardous materials would be **less than significant**.

Off-Site Improvements

The proposed project includes two off-site improvements (public access improvements and removal of existing deteriorated docks) that would take place at the City of Vallejo Municipal Marina located approximately 2 miles north of the project site. The public access improvements would involve installation of a new self-propelled personal watercraft launch ramp just north of the access ramp to K Dock at the south end of the marina. The proposed launch would consist of a pre-cast articulated concrete mat, approximately 10 feet wide by 60 feet long over a geotextile fabric. Approximately eighty (80) 14-inch-diameter creosote timber piles and deteriorated dock facilities would be removed from the northern portion of the marina. Timber removed from the existing docks and the creosote timber piles would be separated based on recyclability. Recyclable and non-recyclable material would be sent to the closest appropriate facility. The proposed off-site impacts would therefore not create a significant hazard to the use, transport, or disposal of hazardous materials. Impacts would be **less than significant.**

B) Would the project 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?

VMT Analysis

As described earlier, the VMT project component would involve the construction of a new wharf structure and a dike along the shoreline. As discussed in Section 3.8, Hydrology and Water

Quality, the use of excavators, backhoes, and other mechanical means to physically grab onto and attempt to free derelict creosote pilings from the seafloor may result in the piling disintegrating into a multitude of wood fragments, exposing previously unweathered polycyclic aromatic hydrocarbons (PAH)-laden creosote to the marine environment. These construction-related effects would present a **significant impact** due to the potential release of hazardous materials into the environment (**Impact 3.7-5**) and mitigation is provided in Section 3.7.5.

It is unlikely that the proposed structures would pose any navigation hazard in the immediate project area because they: (1) would be located adjacent to the existing shoreline, in the same general vicinity of the existing wharf; and (2) would not extend into Mare Island Strait. Therefore, the limited number of large vessels traveling through Mare Island Strait would not be navigating through the area where the proposed VMT wharves would be constructed, which would further reduce the possibility for potential vessel collisions with the structures and corresponding releases of hazardous materials, such as oil and petroleum. In accordance with USACE requirements (33 CFR 66.01), a notice would be published in the Local Notice to Mariners notifying small pleasure craft of changes to navigational hazards caused by the VMT project component.

The VMT project component would primarily service dry bulk and break-bulk cargos. Liquid bulk cargos or large-scale container operations are not envisioned to be handled through the VMT Terminal. While the primary focus of VMT operations would be aggregates, the terminal would be designed to include both shipping and receiving of a wide range of products through the Phase 1 wharf and Phase 2 rock dike, including loading and unloading of vessels through the Phase 1 wharf, along with a combination of barge and other smaller vessels through the Phase 2 rock dike.

Operations at the VMT Site would include rail, cargo ship, truck traffic, and worker vehicles, which if involved in an accident could cause the release of fuels and/or commercial products (potentially containing hazardous materials) to the environment. Therefore, impacts would be **significant (Impact 3.7-6)**, and mitigation is provided in Section 3.7.5. The mitigation measures include the preparation of an Emergency Response Plan to ensure first responders are adequately trained, that local and regional emergency services are aware of the location and operational profile of the facility, and that spills or leaks are assessed and remediated.

Orcem Analysis

As described earlier, the proposed Orcem operations would involve the production of GGBFS. During Orcem operation, the only hazardous material that would be handled in unit quantities of more than small packaged units is portland cement clinker, which would be present in the form of uncrushed clinker and may be ground into powder form on site. Even if clinker were to leak or spill during handling, it would form a mound in the location in which it leaks and would be readily cleaned up by the site operations team.

However, operations at the Orcem Site would include truck traffic and worker vehicles, and industrial processes which if involved in an accident could cause the release of fuels and/or commercial products (potentially containing hazardous materials) to the environment. Therefore, impacts would be **significant (Impact 3.7-7)**, and mitigation is provided in Section 3.7.5.

Off-Site Improvements

As described earlier, the proposed project includes two off-site improvements that would take place at the City of Vallejo Municipal Marina located approximately 2 miles north of the project site. The public access improvements would involve installation of a new self-propelled personal watercraft launch ramp just north of the access ramp to K Dock at the south end of the marina. The project would also involve the removal of existing deteriorated dock improvements within the water area at the north end of the marina. Approximately eighty (80) 14-inch-diameter creosote timber piles and deteriorated dock facilities would be removed from this portion of the marina. Timber removed from the existing docks and the creosote timber piles would be separated based on recyclability. Recyclable and non-recyclable material would be sent to the closest appropriate facility.

The use of excavators, backhoes, and other mechanical means to physically grab onto and attempt to free the piling from the seafloor generally results in the piling disintegrating into wood fragments, exposing previously unweathered PAH-laden creosote to the marine environment. Prior to demolition of the deteriorated dock improvements, the work area would be secured with a temporary debris boom to prevent debris from entering the waters of the marina. The entire in-water work area would be surrounded by a silt curtain to control turbidity. The unused section of deteriorated walkway floats would be removed and transported to shore. Upon completion of the in-water work, the silt curtain would be removed and the site demobilized. The equipment proposed for removal of deteriorated dock facilities within the northerly mitigation site includes an excavator equipped with a hydraulic breaker, a debris boom, a silt curtain, and a skiff. All in-water construction activities would be required to comply with USACE, EPA, RWQCB, and BCDC regulations and provisions in issued permits including BMPs for avoiding or reducing potential impacts related to resuspended sediments. However impacts related to the potential release of PAH-laden creosote piling fragments would be **significant** without mitigation **(Impact 3.7-8)** and mitigation is provided in Section 3.7.5.

C) Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

VMT and Orcem Project Analysis

The nearest school to the project site, Grace Patterson Elementary School, is located approximately 0.3 mile southeast of the VMT Terminal Site and Orcem Site. The project would not result in any hazardous emissions or handling of hazardous materials within 0.25-mile of Grace Patterson Elementary or any other schools. **No impact** would occur as a result of the proposed project.

Off-Site Improvements

As described earlier, the proposed project includes two off-site improvements that would take place at the City of Vallejo Municipal Marina located approximately 2 miles north of the project site. The nearest school to the site of the proposed improvements is the private elementary Saint Vincent Ferrer School located approximately 0.75 mile south and east. **No impact** would occur as a result of the proposed project.

D) Would the project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

VMT and Orcem Project Analysis

Government Code Section 65962.5 requires the California Environmental Protection Agency to compile and update the hazardous waste and substances sites list (Cortese List). While the Cortese List is no longer maintained as a single list, the following databases provide information regarding sites identified as meeting the Cortese List requirements:

1. List of Hazardous Waste and Substances sites from the DTSC Envirostor database (Health and Safety Codes 25220, 25242, 25356, and 116395)
2. List of Leaking Underground Storage Tank (LUST) Sites by County and Fiscal Year from the State Water Resources Control Board GeoTracker database (Health and Safety Code 25295)
3. List of solid waste disposal sites identified by the Water Board with waste constituents above hazardous waste levels outside the waste management unit (Water Code Section 13273 subdivision (e) and California Code of Regulations Title 14 Section 18051))

4. List of "active" Cease and Desist Orders (CDO) and Cleanup and Abatement Orders (CAO) from the State Water Resources Control Board (Water Code Sections 13301 and 13304)
5. List of hazardous waste facilities subject to corrective action pursuant to Section 25187.5 of the Health and Safety Code, identified by DTSC.

Based on a review of the State Water Resources Control Board's on-line Geotracker database, the former General Mills flour mill plant is a LUST cleanup site. Therefore, the project site is included in the list compiled pursuant to Government Code Section 65962.5.

As discussed in the Existing Conditions, Section 3.7.2, various prior investigations have occurred at the project site to investigate, remediate, and manage contamination associated with former LUSTs and other site releases. Based on prior investigations, it is likely that residual concentrations of petroleum hydrocarbons, PAHs, fumigants, volatile organic compounds, and metals remain at the project site. These residual contaminants could present a **significant** impact **(Impact 3.7-9)** during construction and operation of the proposed project. Mitigation measures are provided in Section 3.7.5.

Off-Site Improvements

As described earlier, the proposed project includes two off-site improvements that would take place at the City of Vallejo Municipal Marina located approximately 2 miles north of the project site. These improvements would not occur on a site included in a list of hazardous materials site. Therefore, **no impact** would occur.

E) Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

VMT and Orcem Project Analysis

As described in Section 3.12 of this EIR, Public Services and Recreation, the proposed project is projected to have a significant impact on emergency access, based on the potential delays generated by train crossings at the grade crossings in Vallejo, American Canyon, and crossings further north. However, with implementation of mitigation measure MM-3.12-4 in Section 4.12, Transportation and Traffic, impacts to emergency access due to traffic would be reduced to **less than significant**.

The San Francisco Bay Harbor Safety Committee reviews and updates a Harbor Safety Plan each year. This plan provides mariners using the waters of the San Francisco Bay a guide to critical navigation issues that will enhance vessel safety and reduce degradation of critical resources. The VMT project component would not interfere with provisions of the plan. In addition, as described previously, in accordance with USACE requirements (33 CFR 66.01), a notice will be published in the Local Notice to Mariners notifying small pleasure craft of changes to navigational hazards in the bay caused by the VMT project component. Therefore, impacts would be **less than significant**.

Off-Site Improvements

As described earlier, the proposed project includes two off-site improvements that would take place at the City of Vallejo Municipal Marina located approximately 2 miles north of the project site. The proposed addition of a new personal water craft access ramp within the existing Municipal Marina and the removal of deteriorating dock structures would not impact or interfere with an adopted emergency response plan or emergency evacuation plan. Therefore, **no impact** would occur as a result of the off-site improvements.

3.7.5 Mitigation Measures

Mitigation for Impact 3.7-1: Construction of the proposed project would require the temporary use of hazardous materials, such as diesel fuels, lubricants, solvents, and asphalt. Although adherence to the construction specifications and applicable regulations regarding hazardous materials would reduce impacts during construction of the proposed project, impacts would be significant without proper mitigation.

MM-3.7-1a Hazardous materials shall not be disposed of or released onto the ground, the underlying groundwater, or any surface water. Totally enclosed containment shall be provided for all trash. All construction waste, including trash and litter, garbage, other solid waste, petroleum products, and other potentially hazardous materials, shall be removed to a waste facility permitted to treat, store, or dispose of such materials.

MM-3.7-1b A Hazardous Materials Management Plan shall be prepared to discuss hazardous materials management, handling, storage, disposal, and emergency response planning to be implemented during construction. Hazardous materials spill kits shall be maintained on site for small spills.

Mitigation for Impact 3.7-2: Since the VMT component of the project would require the transportation and/or disposal of potentially contaminated dredged material from Mare Island Strait, impacts would be significant without mitigation.

Refer to **MM-3.8-1** in Section 3.8, Hydrology and Water Quality.

Mitigation for Impact 3.7-3: Due to the potential presence of ACMs, lead-based paints, PCB-containing equipment, mercury-containing equipment, mold growth, and chemical supplies within the project site, project construction could result in a significant impact due to the transport and/or disposal of these materials.

Refer to **MM-3.8-2** in Section 3.8, Hydrology and Water Quality.

MM-3.7-2a An abatement work plan shall be prepared in compliance with local, state, and federal regulations for any necessary removal of such materials. The work plan shall include a monitoring plan to be conducted by a qualified consultant during abatement activities to ensure compliance with the work plan requirements and abatement contractor specifications. Demolition plans and contract specifications shall incorporate any necessary abatement measures for the removal of materials containing asbestos. The measures shall be consistent with the abatement work plan prepared for the project and conducted by a licensed lead/asbestos abatement contractor. Asbestos abatement shall be conducted in coordination with the Bay Area Air Quality Management District, in accordance with District Regulation 11-2-401.3.

MM-3.7-2b A California Department of Health Services (DHS)-certified lead inspector shall survey the buildings for the presence of lead-based paint. Additionally, a qualified environmental specialist shall inspect the site buildings for the presence of polychlorinated biphenyls (PCBs), mercury, and other hazardous building materials prior to demolition. If found, these materials shall be managed in accordance with the Metallic Discards Act and other state and federal guidelines and regulations. Demolition plans and contract specifications shall incorporate any necessary abatement measures in compliance with the Metallic Discards Act of 1991 (Public Resource Code Sections 42160–42185), particularly Section 42175, Materials Requiring Special Handling for the removal of mercury switches, PCB-containing ballasts, and refrigerants. Lead abatement shall be conducted in accordance with California DHS requirements.

MM-3.7-2c A Waste Management and Reuse Plan shall be prepared to discuss the types of wastes anticipated to be generated during construction and operation, the proposed waste handling procedures, proposed waste storage locations, inspection procedures, and proposed waste disposal. The Waste Management and Reuse Plan will also discuss waste minimization and the reuse of demolished site building materials on site. The plan shall discuss estimated quantities of on-site building materials to be reused, the proposed processing of such materials, the proposed disposition of such materials, and the proposed screening and testing procedures to be used to ensure the material reuse will not impact human health or the environment. Material screening shall include visual observation for the presence of oil-stained concrete. Oil-stained concrete shall be disposed of off site and excluded from on-site reuse.

Mitigation for Impacts 3.7-4 and 3.7-9: Due to the potential for contaminated soils or groundwater to be encountered by workers during excavation and grading in other parts of the project site, impacts during construction would be significant without mitigation.

MM-3.7-3 In the event that site grading activities will encounter evidence of contamination or other environmental concerns, a Hazardous Materials Contingency Plan shall be followed during excavation at the subject property. The plan shall (1) specify measures to be taken to protect worker and public health and safety and (2) specify measures to be taken to identify, manage and remediate wastes. The plan should include the following:

- Identification of the known former storage tank and soil contamination areas.
- Information on how to identify suspected contaminated soil.
- Worker health and safety monitoring procedures, including monitoring for organic vapors using a photoionization detector (PID) or other organic vapor analyzer and monitoring dust levels. Organic vapor action levels will be established based on Occupational Safety and Health Administration (OSHA) permissible exposure limits (PELs). Dust action levels will be established based on use of the known arsenic soil concentrations, the PEL, and a factor of safety.
- Procedures for temporary cessation of construction activity and evaluation of the level of environmental concern.
- Procedures for limiting access to the contaminated area to properly trained personnel.
- Procedures for notification and reporting, including internal management and local agencies (fire department, Department of Environmental Health, Air Pollution Control District, etc.), as needed.
- A worker health and safety plan for excavation of contaminated soil.
- Procedures for characterizing and managing excavated soils.
- Procedures for certification of completion of remediation.

Mitigation for Impact 3.7-5: The use of excavators, backhoes, and other mechanical means to physically grab onto and attempt to free derelict creosote pilings from the seafloor may result in the piling disintegrating into a multitude of wood fragments, exposing previously unweathered PAH-laden creosote to the marine environment, which would present a **significant impact** due to the potential release of hazardous materials into the environment.

Refer to **MM-3.3-3** in Section 3.3, Biological Resources.

Mitigation for Impacts 3.7-6 and 3.7-7: VMT and Orcem operations would include transportation of materials by rail, ship, and trucks, as well as industrial processes that could cause the release of hazardous materials in the event of an accident. Therefore, impacts would be **less than significant** without mitigation.

MM-3.7-4 **Emergency Response Plan.** Both the Orcem and VMT facilities shall prepare an emergency response plan for project operations which establishes responsibilities, procedures, and a chain of command to follow in the event of a fire, vehicle/truck collision, train derailment, or cargo ship incident. The plan shall include general notification requirements to local and regional agencies with emergency response capabilities of the location and operational profile of the project, including address, directions, lists of hazardous materials stored on site, and access information. Information must be sufficient in detail to allow quick recognition and access in the event of an emergency. The plan shall require coordination with local first responders and emergency planning agencies (e.g., Water Emergency Transportation Authority (WETA), U.S. Army Corps of Engineers (USACE), fire department, medical facilities, City/County emergency operations center, and County hazardous materials teams) in the event of an emergency situation. The plan shall outline responsibilities and notification requirements for each type of accident or upset condition that may occur on site. The plan shall designate staff persons responsible for addressing and immediately responding to hazardous materials leaks or spills, and shall establish training and record keeping requirements to ensure such teams are qualified and trained in the California Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response Standard (HAZWOPER). The plan shall include procedures for the assessment and cleanup of any on-site spills or leaks resulting from emergency or upset conditions.

Mitigation for Impact 3.7-8: The removal of the deteriorated docks located at the northern end of the City of Vallejo Municipal Marina could result in the release of PAH in the water, which would constitute a **significant impact**.

Refer to **MM-3.3-3** in Section 3.3, Biological Resources.

3.7.6 Level of Significance After Mitigation

Impact 3.7-1: Implementation of mitigation measures MM-3.7-1a and MM-3.7-1b would reduce impacts related to temporary use of hazardous materials, such as diesel fuels, lubricants, solvents, and asphalt during construction to a **less-than-significant** level.

Impact 3.7-2: Implementation of mitigation measure MM-3.8-1 would reduce impacts related to the transportation and/or disposal of potentially contaminated dredged material from Mare Island Strait during construction of the VMT component of the project to a **less-than-significant** level.

Impact 3.7-3: Implementation of mitigation measures MM-3.7-2a through MM-3.7-2c, and MM-3.8-2, would reduce impacts related to the transport and/or disposal of ACMs, lead-based paints, PCB-containing equipment, mercury-containing equipment, mold growth, and chemical supplies within the project site during project construction to a **less-than-significant** level.

Impacts 3.7-4 and 3.7-9: Implementation of mitigation measure MM-3.7-3 would reduce impacts related to contaminated soils or groundwater encountered by workers during excavation and grading in other parts of the project site to **less-than-significant** levels.

Impact 3.7-5: Implementation of MM-3.3-3 would reduce impacts related to potential hazards due to the removal of creosote pilings to a **less-than-significant** level.

Impacts 3.7-6 and 3.7-7: Implementation of mitigation measure MM-3.7-4, Impacts 3.7-6 and 3.7-7 would reduce impacts related to the release of hazardous materials in the event of an accident during transportation of materials by rail, ship, or truck, or industrial operations associated with VMT and Orcem operations to **less-than-significant** levels.

Impact 3.7-8: Implementation of MM-3.3-3 would reduce impacts related to potential hazards due to the removal of creosote pilings to a **less-than-significant** level.

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SOURCE: ESRI 2014, Northgate Environmental Management, Inc, Kennedy/Jenks Consultants 2014, Malcolm Pirnie 2006

FIGURE 3.7-1

Former Chemical Storage and Remediation Areas

VALLEJO MARINE TERMINAL AND ORCEM PROJECT DRAFT EIR

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3.8 HYDROLOGY AND WATER QUALITY

This section analyzes the potential impacts of the Vallejo Marine Terminal (VMT) and Orcem project (proposed project) with respect to hydrology and water quality and recommends mitigation measures where necessary to reduce or avoid significant impacts. The primary information sources used to support this analysis include:

- **Appendix J-1**: Meridian Associates Inc. 2014. *Stormwater Control Plan for 780 & 790 Derr Street, Vallejo, CA*. Prepared for Vallejo Marine Terminal. Job No. 13-05-01. March 27, 2014.
- **Appendix J-2**: KPFF Consulting Engineers. 2014. *Ecocem/Orcem Hydrology and Water Quality Narrative for Section 4 of the Project's Environmental Impact Report (EIR)*. March 11, 2014.
- **Appendix J-3**: KPFF Consulting Engineers. 2015. *Stormwater Management & Treatment Facilities Design Summary for Orcem Project.* January 16, 2015.

Additional information from public agency information sources—such as the State Water Resources Control Board (SWRCB), the San Francisco Bay Regional Water Quality Control Board (RWQCB), the U.S. Geological Survey (USGS), and the Federal Emergency Management Agency (FEMA)—was gathered where necessary to supplement the analysis. All figures referenced in this section are provided at the end of the section.

3.8.1 Regulatory Setting

Federal

The Clean Water Act

The Clean Water Act (CWA) (33 U.S.C. 1251 et seq.), as amended by the Water Quality Act of 1987, is the major federal legislation governing water quality. The objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." Important sections of the act are as follows:

- Sections 303 and 304 provide for water quality standards, criteria, and guidelines.
- Section 401 (Water Quality Certification) requires an applicant for any federal permit that proposes an activity which may result in a discharge to waters of the United States, to obtain certification from the state that the discharge will comply with other provisions of the act.
- Section 402 establishes the National Pollutant Discharge Elimination System (NPDES), a permitting system for the discharge of any pollutant (except for dredged or fill material) into waters of the United States. This permit program is administered by the State Water

Resources Control Board (SWRCB). The various stormwater programs (e.g., for construction activities, industrial activities and municipal systems) administered by the SWRCB (and the nine Regional Water Quality Control Boards [RWQCBs]) are carried out under the authority of this section of the CWA.

- Section 404 establishes a permit program for the discharge of dredged or fill material into waters of the United States. This permit program is jointly administered by the U.S. Army Corps of Engineers (USACE) and the U.S. Environmental Protection Agency (EPA).

Federal Antidegradation Policy

The federal antidegradation policy is designed to protect water quality and water resources. The policy directs states to adopt a statewide policy that includes the following primary provisions: (1) existing instream uses and the water quality necessary to protect those uses shall be maintained and protected; (2) where existing water quality is better than necessary to support fishing and swimming conditions, that quality shall be maintained and protected unless the state finds that allowing lower water quality is necessary for important local economic or social development; and (3) where high-quality waters constitute an outstanding national resource, such as waters of national and state parks, wildlife refuges, and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected.

Federal Emergency Management Agency

FEMA oversees floodplains and administers the National Flood Insurance Program adopted under the National Flood Insurance Act of 1968. The program makes federally subsidized flood insurance available to property owners within communities that participate in the program. Areas of special flood hazard (i.e., subject to inundation by a 100-year flood) are identified by FEMA through regulatory flood maps titled Flood Insurance Rate Maps. The National Flood Insurance Program mandates that development cannot occur within the regulatory floodplain (typically the 100-year floodplain) if that development results in more than 1 foot increase in flood elevation.

State

Porter–Cologne Water Quality Control Act

The Porter–Cologne Water Quality Control Act (California Water Code Section 13000 et seq.) provides the basis for water quality regulation within California. The act requires a “Report of Waste Discharge” for any discharge of waste (liquid, solid, or otherwise) to land or surface waters that may impair a beneficial use of surface or groundwater of the state.

State Water Resources Control Board and Regional Water Quality Control Board

The SWRCB administers water rights, water pollution control, and water quality functions throughout the state, while the RWQCBs conduct planning, permitting, and enforcement activities. The proposed project area lies within the jurisdiction of the San Francisco Bay RWQCB.

The San Francisco Bay RWQCB uses planning, permitting, and enforcement authorities to meet this responsibility, and has adopted the fourth edition of the Water Quality Control Plan (Basin Plan) for the San Francisco Bay Basin (San Francisco Bay RWQCB 2011) to implement plans, policies, and provisions for water quality management. The Basin Plan was prepared in compliance with the federal CWA and the state Porter–Cologne Water Quality Control Act. The Basin Plan establishes beneficial uses for major surface waters and their tributaries, water quality objectives that are intended to protect the beneficial uses, and implementation programs to meet stated objectives.

State and federal laws mandate the protection of designated beneficial uses of water bodies. State law defines beneficial uses as “domestic; municipal; agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves” (Water Code Section 13050[f]). The Basin Plan contains specific numeric and narrative water quality objectives applicable to ambient surface and groundwater resources and for a number of physical parameters, chemical inorganic and organic constituents, biological factors, and toxic priority trace metal and organic compounds. Water quality objectives for toxic pollutants in the Basin Plan complement the federal water quality standards adopted in the California Toxics Rule in May 2000.

NPDES Program – Construction Activity

The NPDES program regulates municipal and industrial stormwater discharges under the requirements of the CWA. California is authorized to implement a state industrial stormwater discharge permitting program, with the SWRCB and San Francisco Bay RWQCB as the permitting agencies.

The City must comply with the requirements of the NPDES permit for Discharges of Storm Water Runoff associated with Construction Activity (Order No. 2009-0009-DWQ, as amended by 2010-0014-DWQ and 2012-006-DWQ). This permit (i.e., the Construction General Permit) regulates discharges from construction sites that disturb 1 acre or more of total land area. By law, all stormwater discharges associated with construction activity where clearing, grading, and excavation results in soil disturbance must comply with the provisions of this NPDES permit. The permitting process requires the development and implementation of an effective Storm Water Pollution Prevention Plan (SWPPP). The project applicant must submit a Notice of Intent to the San Francisco Bay RWQCB to be covered by an NPDES permit and prepare the SWPPP prior to the beginning of construction.

The SWPPP must include best management practices (BMPs) to reduce pollutants and any more stringent controls necessary to meet water quality standards. A SWPPP describes the site, erosion and sediment controls, means of waste disposal, implementation of local plans, control of post-construction sediment and erosion control measures and maintenance responsibilities, and non-stormwater management control. Dischargers are also required to inspect construction sites before and after storms to identify stormwater discharge from construction activity, and to identify and implement controls where necessary. Dischargers must also comply with water quality objectives as defined Basin Plan. If Basin Plan objectives are exceeded, corrective measures would be required.

Implementation of the SWPPP starts with the commencement of construction and continues through completion of the project. Upon completion of the project, the applicant must submit a Notice of Termination to the San Francisco Bay RWQCB to indicate that construction is completed.

NPDES Program – Industrial Activity

In California, cement manufacturing (40 CFR Part 411) occurs under the General Industrial Permit (GIP), issued by the SWRCB and implemented and enforced by the nine RWQCBs. The GIP requires the implementation of management measures that will achieve the performance standard of best available technology economically achievable and best conventional pollutant control technology. The current GIP (97-03-DWQ) will expire on June 30, 2015, and will be replaced by the new GIP (2014-0057-DWQ).

The GIP requires stormwater dischargers to eliminate unauthorized non-stormwater discharges; develop and implement SWPPPs; implement BMPs; conduct monitoring; compare monitoring results to numeric action levels; perform appropriate exceedance response actions when numeric action levels are exceeded; and certify and submit all permit registration documents. Changes under the new GIP compared to the GIP issued in 1997 are that stormwater dischargers are required to implement minimum BMPs; electronically file all permit registration documents via the SWRCB's Storm Water Multiple Application and Report Tracking System; comply with new training expectations and roles for qualified industrial stormwater practitioners; sample to detect exceedance of annual and instantaneous numeric action levels; develop and implement exceedance response actions if annual or instantaneous numeric action levels are exceeded; monitor for parameters listed under CWA Section 303(d); design treatment control BMPs for flow- and volume-based criteria; and understand new criteria, sampling protocols, and sampling frequency for qualifying storm events. The new general order also defines design storm standards for treatment control BMPs, qualifying storm events, and sampling protocols to follow during a design storm event.

Statewide General Waste Discharge Requirements for Discharges to Land with a Low Threat to Water Quality, Water Quality Order No. 2003-0003-DWQ

Among other types of discharges, this general order applies to small/temporary construction-related dewatering discharges to land (i.e., discharges that would evaporate or infiltrate into the ground and would not flow into a surface water body). General waste discharge requirements (WDRs) require dischargers to comply with all applicable Basin Plan provisions, including any prohibitions and water quality objectives governing the discharge. As part of the standard provisions in the order, the discharger is required to develop a discharge management plan incorporating contingency measures, should sampling results show violation of water quality standards. In no case shall the discharge continue to impair beneficial uses or violate water quality standards or cause a possible nuisance condition. A Negative Declaration in compliance with the California Environmental Quality Act (CEQA) has been adopted for these General WDRs. The environmental impacts from new discharges authorized by these General WDRs have been found to be less than significant.

State Nondegradation Policy

In 1968, as required under the federal antidegradation policy described previously, the SWRCB adopted a nondegradation policy aimed at maintaining high quality for waters in California. The nondegradation policy states that the disposal of wastes into state waters shall be regulated to achieve the highest water quality consistent with maximum benefit to the people of the state and to promote the peace, health, safety, and welfare of the people of the state. The policy provides as follows:

> Where the existing quality of water is better than required under existing water quality control plans, such quality would be maintained until it has been demonstrated that any change would be consistent with maximum benefit to the people of the state and would not unreasonably affect present and anticipated beneficial uses of such water.
>
> Any activity which produces waste or increases the volume or concentration of waste and which discharges to existing high-quality waters would be required to meet waste discharge requirements which would ensure (1) pollution or nuisance would not occur, and (2) the highest water quality consistent with the maximum benefit to the people of the state would be maintained.

California Toxics Rule

In May 2000, the SWRCB adopted and the California Environmental Protection Agency approved the California Toxics Rule, which establishes numeric water quality criteria for approximately 130 priority pollutant trace metals and organic compounds. The SWRCB subsequently adopted its State Implementation Policy of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries. The State Implementation Policy outlines procedures for NPDES permitting for toxic pollutant objectives that have been adopted in basin plans and in the California Toxics Rule.

Local

Municipal Stormwater Management Requirements

Pursuant to Section 402 of the CWA and the Porter–Cologne Water Quality Control Act, municipal stormwater discharges in the City of Vallejo (City) are regulated under the San Francisco Bay Region Municipal Regional Stormwater NPDES Permit, Order No. R2-2009-0074, NPDES Permit No. CAS612008, adopted October 14, 2009 (Municipal Regional Permit, or MRP). The most relevant requirement that pertains to the project is Provision C.3.

MRP Provision C.3 addresses *post-construction* stormwater management requirements for new development and redevelopment projects. Currently, the City of Vallejo requires project applicants to install hydrodynamic devices, or other BMPs, to remove pollutants such as floating liquids and solids, trash and debris, and coarse sediment from stormwater runoff, and to show the locations of such controls on plans submitted with the building permit application. In addition, the City requires implementation of Low Impact Development (LID) strategies, preventative source controls, and additional stormwater treatment measures to minimize the discharge of pollutants in stormwater runoff and non-stormwater discharge of certain industrial projects, as well as prevention of increase in runoff flows. The MRP requires that LID methods shall be the primary mechanism for implementing such controls. Because the project replaces more than 50% (nearly 100%) of the impervious surface of a previously existing development that was not subject to Provision C.3, all impervious surfaces must be included in the stormwater treatment system design.

The required incorporation of stormwater treatment systems designed per the following hydraulic sizing criteria (Appendix J-1):

- Volume Hydraulic Design Basis – Treatment systems whose primary mode of action depends on volume capacity shall be designed to treat stormwater runoff equal to: (a) the maximized stormwater capture volume for the area, on the basis of historical rainfall records, determined using the formula and volume capture coefficients set forth in Urban Runoff Quality Management, Water Environment Federation Manual of Practice No. 23/American Society of Civil Engineers Manual of Practice No. 87, (1998), pages 175–178 (e.g., approximately the 85th percentile 24-hour storm runoff event); or (b) the volume of annual runoff required to achieve 80% or more capture, determined in accordance with the methodology set forth in Section 5 of the California Stormwater

Quality Association's Stormwater Best Management Practice Handbook, New Development and Redevelopment (2003), using local rainfall data;

- Flow Hydraulic Design Basis – Treatment systems whose primary mode of action depends on flow capacity shall be sized to treat: (a) 10% of the 50-year peak flow rate; (b) the flow of runoff produced by a rain event equal to at least two times the 85th percentile hourly rainfall intensity for the applicable area, based on historical records of hourly rainfall depths; or (c) the flow of runoff resulting from a rain event equal to at least 0.2 inches per hour intensity; or
- Combination Flow and Volume Design Basis – Treatment systems that use a combination of flow and volume capacity shall be sized to treat at least 80% of the total runoff over the life of the project, using local rainfall data.

Effective December 1, 2011, projects must treat 100% of runoff (based on the selected calculation described above) with LID treatment measures that include harvesting and reuse, infiltration, evapotranspiration, or biotreatment (biotreatment may only be used if the other options are infeasible; MRP permittees, working collaboratively or individually, shall submit a report to the RWQCB on the criteria and procedures that will be used to determine when certain LID measures are infeasible). Biotreatment areas shall be designed to have a long-term infiltration rate of 5 to 10 inches per hour. Furthermore, MRP permittees implementing biotreatment LID measures, working collaboratively or individually, shall submit for RWQCB approval, a proposed set of model biotreatment soil media specifications and soil infiltration testing methods.

The City also requires development projects to incorporate the following source control and site design measures:

- Minimize stormwater pollutants of concern through measures that may include plumbing dumpster drips from covered trash, food waste, and compactor enclosures to the sanitary sewer;
- Properly design covers, drains, and storage precautions for outdoor material storage areas and loading docks;
- Properly designed trash storage areas;
- Minimize stormwater runoff by implementing one or more site design measures, which include directing roof runoff into cisterns or rain barrels for reuse, or directing roof runoff to vegetated areas.

The City also has a performance standard for hydromodification management; however, these standards do not apply to the proposed project because it is mapped as draining to a continuously hardened surface (Geosyntec 2013).

Vallejo Municipal Code – Water Efficient Landscaping Requirements

Section 16.71.055 of the Vallejo Municipal Code (Title 16, Zoning; 16.71, Water Efficient Landscaping Requirements; 16.71.055 Stormwater Management) encourages implementation of stormwater BMPs into the landscape and grading design plans to minimize runoff and to increase on-site retention and infiltration.

Vallejo Municipal Code – Excavation, Grading, and Filling

Chapter 12.40 of the Vallejo Municipal Code (Ordinance 400 N.C.(2d) section 1 (part), 1977) establishes rules and regulations for excavation, grading, and filling activities intended to preserve and enhance the natural beauty of the land, streams, and shorelines, and to reduce or eliminate the hazards of earthslides, mud flows, rock falls, undue settlement, erosion, siltation, and flooding. To obtain a grading permit, plans and specifications prepared by a licensed engineer must be submitted to the city engineer/director of public works for review and approval. Plans and specification, among many things, must show:

- A vicinity sketch or other data adequately indicating the site location;
- Property lines of the property on which the work is to be performed;
- Location of any buildings or structures within 50 feet of the proposed work;
- Accurate contours showing the topography of the existing ground;
- Elevations, dimensions, location, extent, and the slopes of all proposed grading shown by contours and/or other means; and
- Details of all drainage devices, walls, or other protective devices to be constructed in connection with, or as a part of, the proposed work.

In addition, the application must also contain the following:

- Erosion control methods and details, including schedule for installation. Erosion control plans for large-scale projects (50 acres or 200 lots, whichever is less) shall be prepared by a hydrologist specializing in erosion control.
- A map showing the drainage area and estimated runoff of the work and adjacent areas.
- A soils investigation report, including data regarding the nature, distribution, and strength of existing soils, conclusions, and recommendations for grading procedures and design criteria.
- A geological report, including an adequate description of the geology of the site and conclusions and recommendations regarding the effect of geologic conditions on the proposed work.

No permit shall be granted until all of the required data has been submitted for the application; the city engineer/director of public works has approved the plans; and all required fees have been paid.

3.8.2 Existing Conditions

Climate

Typical of the western portions of Solano County in the vicinity of the Napa River and San Pablo Bay, Vallejo has a Mediterranean climate with cool summers (Geosyntec 2013). Average annual precipitation in the City is approximately 20 to 26 inches according to the Solano County Water Agency isohyetal map, is derived from frontal storms originating over the Pacific Ocean (Geosyntec 2013). A vast majority of this rain falls between October and May.

Watershed Description

The project site is on the shore of the Mare Island Strait (also referred to as the tidal section of the Napa River) and is backed by hillsides. According to the USGS National Hydrography Dataset, there are no rivers or creeks flowing into, through or near the project site. Drainage maps prepared for the City of Vallejo indicate the project is situated within an area draining through “continuously hardened conveyances” directly to Mare Island Strait and into San Pablo Bay, at its confluence with Carquinez Strait (Geosyntec 2013). This means that stormwater runoff in the vicinity enters storm drain systems instead of creeks or stream channels. According to the Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) (San Francisco RWQCB 2011), beneficial uses of the San Pablo Bay include the following: municipal and domestic supply; agricultural supply, industrial service supply, water contact recreation, non-contact water recreation, commercial and sport fishing, shellfish harvesting, estuarine habitat, fish migration, preservation of rare and endangered species, fish spawning, wildlife habitat, and navigation.

Topography, Stormwater Runoff, and Drainage

The site is the former General Mills plant fronting the Mare Island Strait at the end of Derr Avenue, and is bounded by undeveloped, vegetated slopes. To the southeast (beyond the slope) are residential homes and a school (Grace Patterson Elementary). The site topography ranges from approximately 145 feet above mean sea level (amsl) at the top of the slope at the southeastern boundary of the site, approximately one-quarter mile from the school, to 18 feet amsl at the northeast limit of the operations area (see Appendix J-1). From there, the ground slopes southwesterly to the strait at 11 feet amsl, with surface slopes ranging from 1% to 7%. At the shoreline, the ground locally has steeper slopes (10% to 60%) over short distances as the land enters the water surface, which has an elevation of approximately 4.2 feet amsl at low tide (Appendix J-1).

The project site has an existing stormwater drainage system consisting of a series of earthen and lined ditches, drop inlets, and underground pipe conveyance system (Appendix J-2). A 30-inch storm drain culvert discharges site's runoff directly into Mare Island Strait northwest of the site (Appendix J-2).

Flooding, Dam Inundation, and Coastal Hazards

Based on the FEMA Flood Insurance Rate Map (Panel 0630E for Solano County California), the Orcem Site is not located within a Special Flood Hazard Area subject to a 1% annual chance of flooding (often referred to as a 100-year flood). However, as shown in Figure 3.8-1, the majority of the VMT Site is within a Special Flood Hazard Area (Zone AE; at or below 9 feet amsl).

The project site is not located within a dam failure inundation hazard area, as determined by the California Office of Emergency Services and mapped by the Association of Bay Area Governments (ABAG 2014). In addition, a tsunami inundation map for the project area, prepared as part of a statewide multi-agency effort, shows that the Orcem Site is outside the zone of tsunami inundation (CalEMA 2009a). The VMT Site is within a tsunami inundation zone, but the extent of tsunami inundation is less than the anticipated extent of the 100-year flood.

Groundwater Basin and Groundwater Quality

The project site is located within the Napa-Sonoma Volcanic Highlands groundwater source area. The Basin Plan does not currently provide beneficial uses of the groundwater and indicates that the beneficial uses will be provided at a later date; in the interim, groundwater beneficial uses are determined on a site-by-site basis. Local groundwater is not used for water supply by the City of Vallejo (City of Vallejo 2006). Groundwater quality in the project area was characterized as exceeding the EPA's Specific Environmental Screening Levels for arsenic and metal concentrations in analyzed samples; overall, the site's groundwater was determined to be unsuitable for a potential source of drinking water (Appendix I-3). The groundwater was encountered at the project site at depths ranging from approximately 3.8 to 5.9 feet below ground surface; groundwater levels are expected to vary by season and by location within the site. According to a groundwater monitoring report and tidal survey conducted by Malcolm Pirnie (Appendix I-1), groundwater generally flows towards the west of the site.

Surface Water Quality

The quality of surface water in the vicinity of the project is affected by past and current land uses in the watershed, as well as local geology. Surface water quality is regulated by the SWRCB and San Francisco Bay RWQCB. Table 3.8-1 lists the beneficial uses of the water bodies relevant to the proposed project (because stormwater runoff would enter the Mare Island Strait, which discharges to the Carquinez Strait, San Pablo Bay, and the Central San Francisco Bay).

Table 3.8-1
Existing Beneficial Uses of Relevant Water Bodies

Category	Beneficial Use	Mare Island Strait	Carquinez Strait	San Pablo Bay	San Francisco Bay (Central)
Human Consumptive Uses	Agricultural Supply (AGR)				
	Municipal and Domestic Supply (MUN)				
	Freshwater Replenishment (FRSH)				
	Groundwater Recharge (GWR)				
	Industrial Service Supply (IND)		E	E	E
	Industrial Process Supply (PROC)				E
	Commercial and Sport Fishing (COMM)	E	E	E	E
	Shellfish Harvesting (SHELL)			E	E
Aquatic Life Uses	Cold Water Habitat (COLD)				
	Estuarine Habitat (EST)	E	E	E	E
	Marine Habitat (MAR)				
	Fish Migration (MIGR)	E	E	E	E
	Preservation of Rare and Endangered Species (RARE)	E	E	E	E
	Fish Spawning (SPWN)		E	E	E
	Warm Freshwater Habitat (WARM)				
Wildlife Uses	Wildlife Habitat (WILD)	E	E	E	E
Recreational Uses	Water Contact Recreation (REC1)	E	E	E	E
	Noncontact Water Recreation (REC2)	E	E	E	E
	Navigation (NAV)		E	E	E

Source: San Francisco Bay RWQCB 2011.
E = Existing beneficial use;

The CWA Section 303(d) Impairments in Northern San Francisco Bay-Delta are listed in Table 3.8-2. Under Section 303(d) of the CWA, the State of California is required to develop a list of water-quality limited (i.e., impaired) waters that do not meet water quality standards and objectives. Being “water quality limited” means that a water body is “not reasonably expected to attain or maintain water quality standards” without additional regulation. The law requires that the EPA develop total maximum daily loads (TMDLs) for each impaired water body in the nation, which specifies the maximum amount of a pollutant that a water body can receive and still meet water quality standards. A total maximum daily load may also include a plan for bringing an impaired water body back within standards. None of the water quality impairments listed in Table 3.8-2 have approved TMDLs, with the exception of mercury.

Table 3.8-2
CWA Section 303(d) Impairments in Northern San Francisco Bay-Delta

Water Bodies	Pollutant/Stressor	Potential Sources	TMDL Status	Year
Carquinez Strait; San Pablo Bay; and San Francisco Bay (Central)	Chlordane	Nonpoint Source	Scheduled	2013
	DDT	Nonpoint Source	Scheduled	2013
	Dieldrin	Nonpoint Source	Scheduled	2013
	Dioxin Compounds	Atmospheric Deposition	Scheduled	2019
	Furan Compounds	Atmospheric Deposition	Scheduled	2019
	Invasive Species	Ballast Water	Scheduled	2019
	Mercury	Atmospheric Deposition; Industrial Point Sources; Natural Sources; Nonpoint Sources; Resource Extraction	Approved	2008
	PCBs	Unknown Nonpoint Source	Scheduled	2008
	Selenium	Industrial Point Sources	Scheduled	2010
San Francisco Bay (Central)	Trash	Illegal dumping, Urban runoff/storm sewers	Scheduled	2021

Source: SWRCB 2014.
TMDL = total maximum daily load; DDT = dichlorodiphenyltrichloroethane; PCB = polychlorinated biphenyl

The Bay Regional Monitoring Program (RMP) provides water quality regulators and policy-makers with information they need to manage the Bay effectively. The program is an innovative collaborative effort between the San Francisco Estuary Institute, the San Francisco Bay RWQCB, and the regulated discharger community. Table 3.8-3 lists selected monitoring results for constituents of concern from a station along the Mare Island Strait, located about a mile northeast of the project site.

Table 3.8-3
Mare Island Strait Water Quality Monitoring Results

Medium	Pollutant/Stressor	Date Range	No. of Samples	Average Value	Unit
Water	Mercury, dissolved	1993 – 2001	23	0.002	µg/L
Water	Methylmercury, dissolved	2000 – 2001	2	0.0087	ng/L
Water	DDT (sum), dissolved	1995 – 1997	9	1.78	pg/L
Water	PCBs (sum of 40)	1993 – 2001	21	138.04	pg/L
Water	Selenium, dissolved	1993 – 2001	25	0.159	pg/L
Sediment	Mercury	1993 – 2001	13	0.33	mg/kg
Sediment	Methylmercury	2000 – 2001	3	0.1528	µg/kg
Sediment	DDT (sum)	1993 – 2001	19	4.81	µg/kg
Sediment	PCBs (sum of 40)	1993 – 2001	18	5.26	µg/kg
Sediment	Selenium	1993 – 2012	18	0.518	mg/kg

Source: SFEI 2014.

3.8.3 Thresholds of Significance

The following criteria, included in Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.), will be used to determine the significance of potential hydrology and water quality impacts. Impacts to hydrology and water quality would be significant if the proposed project would:

A) Violate any water quality standards or waste discharge requirements;

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

C) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site;

D) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;

E) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;

F) Otherwise substantially degrade water quality;

G) Place within a 100-year flood hazard area structures which would impede or redirect flood flows;

H) 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; or

I) Inundation by seiche, tsunami, or mudflow.

This analysis assumes that construction and design of proposed facilities would implement standard BMPs for the control of stormwater and prevention of pollutant discharges, as required under required NPDES permits (construction and/or industrial), Waste Discharge Requirements, and the regional municipal stormwater permit (see Section 3.8.1). This analysis also assumes that the Stormwater Control Plans developed by Meridian and Associates Inc. (2014, Appendix J-1) and KPFF Consulting Engineers (2015, Appendix J-3), refined as necessary according to final designs, would be implemented as part of the VMT and Orcem project components and incorporated into their final designs.

3.8.4 Impact Discussion

A) Would the project violate any water quality standards or waste discharge requirements?

VMT Analysis

Construction Impacts

VMT construction activities would include existing on-site structure demolition, grading (both cut and fill), vegetation removal, and new building construction, as well as other on-site improvements (parking areas, landscaping, and driveways). Construction period activities could generate stormwater runoff that could cause or contribute to a violation of water quality standards or waste discharge requirements, provide substantial additional sources of polluted runoff, or otherwise substantially degrade the water quality of Mare Island and/or San Pablo Bay. In areas of active construction, soil erosion may result in discharges of sediment-laden stormwater runoff into the water bodies, if not properly controlled. Additional sediment input to the shoreline from construction of the VMT project component could contribute to degradation of downstream water quality and impairment of the beneficial uses identified in Section 3.8.1. Sediment can also be a carrier for other pollutants, such as heavy metals, nutrients, pathogens, oil and grease, fuels and other petroleum products. In addition to sediment, other pollutants associated with the various phases of construction, such as trash, paint, solvents, sanitary waste from portable restrooms, and concrete curing compounds, can discharge into and impair receiving waters if released during construction.

As part of VMT permitting and approval, the applicants will be required to develop and implement a SWPPP in accordance with SWRCB and San Francisco Bay RWQCB requirements (as described in Section 3.8.1). The SWPPP must specify the location, type, and maintenance requirements for BMPs necessary to prevent stormwater runoff from carrying construction-related pollutants into nearby receiving waters (in this case, the Bay-Delta). BMPs must be implemented to address potential release of fuels, oil, and/or lubricants from construction vehicles and equipment (e.g., drip pans, secondary containment, washing stations); release of sediment from material stockpiles and other construction-related excavations (e.g., sediment barriers, soil binders); and other construction-related activities with the potential to adversely affect water quality. The number, type, location, and maintenance requirements of BMPs to be implemented as part of the SWPPP depend on site-specific risk factors such as soil erosivity factors, construction season/duration, and receiving water sensitivity.

SWPPPs must be developed and implemented by a Construction General Permit Qualified SWPPP Developer (QSD)/Qualified SWPPP Practitioner (QSP). The QSD/QSP is tasked with determining the receiving water risks (including beneficial uses and CWA Section 303d impairments), monitoring site activities that could pose risks to water quality, and developing a comprehensive strategy to control construction-related pollutant loads in site runoff. Minimum standard BMPs include erosion and sediment controls; site management/ housekeeping/waste management; management of non-stormwater discharges; runon and runoff controls; and BMP inspection, maintenance, and repair activities. A rain event action plan must also be prepared by the QSD/QSP to outline the procedures to prepare the construction site for rain events and minimize the potential release of construction-related contaminants. The following are the types of BMPs that are typically included in a construction SWPPP (subject to review and approval by the RWQCB).

Erosion Control BMPs

- *Scheduling*. To reduce the potential for erosion and sediment discharge, construction shall be scheduled to minimize ground disturbance during the rainy season. The project applicant shall:
  - Sequence construction activities to minimize the amount of time that soils remain disturbed.
  - Stabilize all disturbed soils as soon as possible following the completion of ground-disturbing work.
  - Install erosion and sediment control BMPs prior to the start of any ground-disturbing activities.
- *Preservation of Existing Vegetation*. Where feasible, existing vegetation shall be preserved to provide erosion control.
- *Stabilize Soils*. Hydroseeding, geotextile fabrics and mats, mulch, or soil binders shall be used, as appropriate, to reduce erosion on exposed soil surfaces.
- *Earth Dikes, Drainage Swales and Slope Drains*. Earth dikes, drainage swales, or slope drains shall be constructed to divert runoff away from exposed soils and stabilized areas, and redirect the runoff to a desired location, such as a sediment basin.
- *Outlet Protection and Velocity Dissipation Devices*. Rock, concrete rubble, or grouted riprap shall be installed at culvert and pipe outlets to drainage conveyances, to prevent scour of the soil caused by concentrated high-velocity flows.

Sediment Control BMPs

- *Silt Fence/Fiber Roll*. Silt fences or fiber rolls shall be installed around the perimeter of the areas affected by construction, at the toe of slopes, around storm drain inlets, and at outfall areas, to prevent off-site sedimentation.

- *Street Sweeping and Vacuuming*. Areas with visible sediment tracking shall be swept or vacuumed daily to prevent the discharge of sediment into the stormwater drainage system or creeks.
- *Storm Drain Inlet Protection*. Storm drains shall be protected using a filter fabric fence, gravel bag barrier, or other methods, to allow sediments to be filtered or settle out before runoff enters drain inlets.
- *Check Dams*. Barriers shall be constructed of rock, gravel bags, sand bags, or fiber rolls across a constructed swale or drainage ditch, to reduce the effective slope of the channel. This reduces the velocity of runoff, which allows sediment to settle and reduces erosion.
- *Sediment Traps*. Sediment traps shall be constructed where sediment-laden runoff may enter the stormwater drainage systems or creeks. Sediment traps are appropriate for drainage areas less than 5 acres.
- *Sediment Basins*. If used on site, sediment basins shall be designed according to the method provided in the California Stormwater Quality Association Stormwater BMP Handbook – Construction. Sediment basins are appropriate for drainage areas of 5 acres or greater.

<u>Wind Erosion Control BMPs</u>

- *Dust Control*. Potable water shall be applied using water trucks to alleviate nuisance caused by dust. Water application rates shall be minimized to prevent erosion and runoff.
- *Stockpile Management*. Silt fences shall be used around the perimeter of stockpiles, and stockpiles shall be covered to prevent wind dispersal of sediment.

<u>Tracking Control BMPs</u>

- *Stabilized Construction Entrance/Exit*. Construction site entrances and exits shall be graded and stabilized to reduce the tracking of mud and dirt onto public roads by construction vehicles.
- *Stabilized Construction Roadway*. Access roads, parking areas, and other on-site vehicle transportation routes shall be stabilized immediately after grading is completed, and frequently maintained to prevent erosion and to control dust.
- *Tire Wash*. A tire washing facility shall be installed at stabilized construction access points to allow for tire washing when vehicles exit the site to prevent tracking of dirt and mud onto public roads.

Non-stormwater Control BMPs

- *Dewatering*. The SWPPP shall include a dewatering plan for non-contaminated groundwater specifying methods of water collection, transport, treatment, and discharge. The discharger shall consult with the RWQCB regarding any required permit (other than the Construction General Permit) or Basin Plan conditions prior to initial dewatering activities to land, storm drains, or receiving waters. Water produced by dewatering shall be impounded in holding tanks, sediment basins, or other holding facilities to settle the solids and provide other treatment as necessary prior to discharge to receiving waters. Discharges of water produced by dewatering shall be controlled to prevent erosion.
- *Illicit Connection/Discharge Detection and Reporting*. Contractors shall regularly inspect the site for evidence of illicit connections, illegal dumping, or discharges. Such illicit activities shall immediately be reported to the Vallejo Sanitation and Flood Control District (VSFCD).
- *Vehicle and Equipment Cleaning*. Construction equipment shall be washed regularly in a designated stabilized area on site or off site. Steam cleaning will not be performed on site. Phosphate-free, biodegradable soaps shall be used for on-site activities. Wash water from on-site activities shall be contained and infiltrated to avoid discharges to drain inlets and creeks.
- *Vehicle and Equipment Fueling and Maintenance*. Vehicles and equipment shall be inspected daily for leaks. Perform vehicle maintenance and fueling off site whenever possible. If maintenance and fueling must take place on site, designated areas shall be located at least 50 feet away from storm drain inlets, drainage courses, and receiving waters. Fueling areas shall be protected with berms and dikes to prevent runon, runoff, and to contain spills. Fueling shall be performed on level grade. Nozzles shall be equipped with automatic shutoffs to control drips. Stored fuel shall be enclosed or covered. Drip pans shall be used for all vehicle and equipment maintenance activities. Spill kits shall be available in maintenance and fueling areas, and spills shall be removed with absorbent materials and not washed down with water. If spills or leaks occur, contaminated soil and cleanup materials shall be properly disposed.
- *Paving and Grinding Operations*. Proper practices shall be implemented to prevent run-on and runoff, and to properly dispose of waste. Paving and grinding activities shall be avoided during the rainy season, when feasible.

Waste Management and Materials Pollution Control BMPs

- *Material Delivery and Storage and Use*. Materials such as detergents, concrete compounds, petroleum products, and hazardous materials shall be stored in a designated area away from vehicular traffic, drain inlets, and creeks. The materials shall be stored on pallets with secondary containment. Spill clean-up materials, material safety data sheets, a material inventory, and emergency contact numbers shall be maintained in the storage area.

- *Spill Prevention and Control*. Proper procedures shall be implemented to contain and clean up spills and prevent material discharges into the storm drain system.
- *Waste Management*. Solid waste shall be collected in designated areas and stored in watertight containers located in a covered area or with secondary containment. Waste shall be removed from the site regularly. Hazardous wastes shall be stored and disposed in accordance with applicable regulatory requirements.
- *Sanitary/Septic Waste Management*. Portable toilets shall be located at least 50 feet away from drain inlets and water bodies and away from paved areas.
- *Stockpile Management*. Stockpiles shall be surrounded by sediment controls, covered, and located at least 50 feet from concentrated flows of stormwater, inlets, and creeks.
- *Concrete Waste Management*. Concrete washout shall be performed off site or in a designated area at least 50 feet away from storm drain inlets or creeks. A temporary pit or bermed area shall be constructed where the waste can be discharged and allowed to set for proper disposal.
- *Training*. Construction site personnel shall receive training on implementing all BMPs included in the SWPPP. A Qualified SWPPP Practitioner shall perform all BMP inspection/maintenance/repair and site-monitoring activities.

Normally, the standard requirements contained in a SWPPP are sufficient to address a project's potential to violate water quality standards or waste discharge requirements, particularly when construction activities are land-based. In addition to stormwater runoff, construction activities can generate fugitive dust, which if not properly controlled, can be deposited in nearby waters. Note that this potential impact is addressed in Section 3.2, Air Quality — actions to mitigate adverse effects on air quality would likewise mitigate potential adverse effects on water quality from atmospheric deposition.

However, due to the general type and magnitude of in-water construction activities proposed on the VMT Site, as well as the applicant's proposal to reuse dredged sediments and to process on-site concrete for reuse as engineered backfill, implementation of a SWPPP alone may not be adequate to reduce the potential for project construction to violate water quality standards in the Mare Island Strait. Beneficial use of dredge material on site would be sought by the applicant, although any material unfit for reuse would be deposited at the Carquinez disposal site, or other approved location. Phase 2 would include approximately 115,000 cubic yards of solid fill. In order to backfill the area behind the Phase II dike, the applicant proposes to reuse dredged material mixed with Class 2 aggregate processed from on-site concrete building demolition as engineered fill placed behind the dike and allowed to dry over time. Dredging of approximately 46,515 cubic yards would also be required, pursuant to a USACE permit, as part of Phase 2 to establish a berthing depth of 25 feet to 38 feet below mean lower low water (MLLW). The MLLW is the average of the lower low water height of each tidal day observed over the National Tidal Datum Epoch. For stations with shorter series, comparison of simultaneous observations with a control tide station is made in order to derive the equivalent datum of the National Tidal Datum Epoch (NOAA 2015).

As discussed in Section 3.8.2, the applicable receiving waters (i.e., the Napa River, Carquinez Strait, San Pablo Bay, and San Francisco Bay) have a number of water quality impairments, including impairments for mercury and selenium, which in-water dredging and fill activities may affect. There are also numerous aquatic special-status species with the potential to occur in the area (discussed at length in Section 3.3). Dredge and fill activities could potentially remobilize pollutants absorbed onto fine sediments such as Bay mud and silt that would otherwise have remained trapped beneath the floor of the Bay. The re-suspension of dredged sediments may increase contaminant bioavailability in the water column. Furthermore, on-site materials, such as concrete foundations, if reused as riprap or processed as engineered aggregate, could introduce residual contaminants left over from former industrial uses into Bay-Delta waters. For example, use of excavators, backhoes, and other mechanical means to physically grab onto and attempt to free derelict creosote pilings from the seafloor may result in the piling disintegrating into a multitude of wood fragments, exposing previously un-weathered polycyclic aromatic hydrocarbons (PAH)-laden creosote to the marine environment. These construction-related effects would present a **potentially significant** impact with respect to water quality (**Impact 3.8-1**) and mitigation is provided in Section 3.8.5.

Operational Impacts

VMT would construct impervious surfaces such as roofs, driveways, and parking lots, upon which pollutants such as raw and finish material spills, metals, dust/sediment, oil and grease could accumulate and come into contact with rain and stormwater runoff, which would discharge into the downstream water bodies. Pollutants could also be generated from the loading, delivery, and trash pick-up areas. In addition, industry specific higher levels of alkalinity (pH10 and above) and fine particles in materials handled by the proposed facility may contaminate stormwater runoff. If not properly controlled, the discharge of polluted stormwater runoff could adversely affect water quality and the beneficial uses of receiving waters.

Provision C.3 of the regional municipal stormwater permit addresses post-construction stormwater management requirements for new development and redevelopment projects. Currently, the City of Vallejo requires project applicants to install hydrodynamic devices or incorporate other BMPs to remove pollutants, such as floating liquids and solids, trash and debris, and coarse sediment, from stormwater runoff and to show the locations of such controls on plans submitted with the building permit application. In addition, the City requires implementation of LID strategies, preventative source controls, and additional stormwater treatment measures to minimize the discharge of pollutants in stormwater runoff and non-stormwater discharge of certain industrial projects, as well as prevention of an increase in runoff flows.

Appendix J-1 describes how the applicant intends to comply with NPDES-related stormwater permitting requirements, including measures to reduce development and minimize impervious area, measures to limit directly connected impervious areas, and specifics on the location and design of vegetated swales and bio-basins. Figure 3.8-2 includes a site plan showing the anticipated flow directions on site, the location of proposed stormwater drainage pipes, and the location and size of vegetated swales and bio basin (including a cross section). According to Appendix J-1, the proposed project would result in a decrease in impervious surface coverage and a reduction in the amount of water discharged into the Mare Island Strait compared to existing conditions. This is also shown in Table 3.8-4. Importantly, the Phase I wharf and Phase II dike would be constructed in a manner that directs stormwater flow inland towards on-site storm drains and away from the tidal shoreline. Appendix J-1 and Figure 3.8-2 show that all stormwater on site would be directed to stormwater pipes, and eventually to vegetated swales and a bio-basin for retention and treatment through infiltration. The bio-basin has been designed so that direct discharges to the shoreline would only occur during prolonged and intense storms (i.e., greater than a 10-year storm), when the volume of the basin reaches capacity. At all other times stormwater would be treated through infiltration through a grassy basin designed to have a minimum infiltration rate of 5 inches per hour. Under existing conditions, stormwater runoff is not detained or treated prior to discharge.

Table 3.8-4
VMT Pre-Development and Post-Development Impervious Surfaces

Parameter	Pre-Development Condition	Post-Development Condition	Change
Area	8.8 acres	10.9 acres	+24%
Impervious (building, roads and paved lots)	3.1 acres (35%)	2.7 acres (25%)	-15%
Semi Pervious (gravel and dock areas)	4.4 acres (50%)	6.6 acres (60%)	+50%
Landscape (incl. bio-basin and swales)	1.3 acres (15%)	1.6 acres (15%)	+23%
Weighted Impermeability Factor	**0.63**	**0.60**	**-5%**

Source: Appendix J-1.

The stormwater system design described above is specific to the VMT project component and would adequately address the potential for stormwater runoff to adversely affect water quality. In addition to stormwater runoff, operational activities could generate fugitive emissions, which if not properly controlled, could be deposited in nearby waters. Note that this potential impact is addressed in Section 3.2, Air Quality—actions to mitigate adverse effects on air quality would likewise mitigate potential adverse effects on water quality from atmospheric deposition. Besides Provision C3 of the regional municipal stormwater permit, VMT is also subject to the newly adopted GIP (SWRCB Order No. 2014-0057-DWQ), as described in Section 3.8.1.

Because the drainage system has been adequately designed to handle runoff in a manner that would not violate water quality objectives, and because a SWPPP would be prepared for the operational phase of the project in compliance with NPDES permitting requirements (GIP 2014-0057-DWQ), the operational impacts of the VMT project component would be **less than significant**.

Orcem Analysis

Construction Impacts

The analysis of construction-related impacts of the Orcem project component is generally the same as provided above for VMT, except that there would be no in-water construction activities (which for VMT results in a potentially significant impact). The construction SWPPP would adequately address the potential for degradation of water quality from stormwater runoff on the construction site. Therefore the construction-related impacts of the Orcem project component would be **less than significant**.

Operational Impacts

Orcem would construct impervious surfaces such as roofs, driveways, parking lots, and material storage facilities. Pollutants such as raw and finish material spills, metals, dust/sediment, oil, and grease could accumulate and come into contact with rain and stormwater runoff, which would discharge into the downstream waterbodies. In addition, pollutants related to the planned industrial activities on the site could produce industry-specific higher levels of alkalinity (pH10 and above), and fine particles including heavy metals may contaminate stormwater.

Provision C.3 of the regional municipal stormwater permit addresses post-construction stormwater management requirements for new development and redevelopment projects. Currently, the City of Vallejo requires project applicants to install hydrodynamic devices or incorporate other BMPs to remove pollutants, such as floating liquids and solids, trash and debris, and coarse sediment, from stormwater runoff and to show the locations of such controls on plans submitted with the building permit application. In addition, the City requires implementation of LID strategies, preventative source controls, and additional stormwater treatment measures to minimize the discharge of pollutants in stormwater runoff and non-stormwater discharge of certain industrial projects, as well as prevention of increase in runoff flows.

Appendix J-2 describes how the applicant intends to comply with NPDES-related stormwater permitting requirements. According to Appendix J-2, the project would result in an insignificant increase in the peak flowrate of water discharge off site. A portion of this increase would be mitigated by the addition of rainwater harvesting tanks, with stormwater reused to dampen material piles and limit fugitive dust. In addition, all stormwater that falls on site will be directed through a series of treatment facilities to control pH and reduce turbidity, sediment, heavy metals, and other targeted pollutants. Figure 3.8-3 includes a site plan showing the anticipated flow directions on site, the location of proposed stormwater drainage pipes, and the location and size of stormwater control BMPs.

The stormwater system design described previously is specific to the Orcem project component and would adequately address the potential for stormwater runoff to adversely affect water quality. In addition to stormwater runoff, operational activities could generate fugitive emissions, which if not properly controlled, could be deposited in nearby waters. Note that this potential impact is addressed in Section 3.2, Air Quality—actions to mitigate adverse effects on air quality would likewise mitigate potential adverse effects on water quality from atmospheric deposition. Besides Provision C3 of the regional municipal stormwater permit, VMT is also subject to the newly adopted GIP (SWRCB Order No. 2014-0057-DWQ), as described in Section 3.8.1.

Because the drainage system has been adequately designed to handle runoff in a manner that would not violate water quality objectives, and because a SWPPP would be prepared for the operational phase of the project in compliance with NPDES permitting requirements (GIP 2014-0057-DWQ), the operational impacts of the Orcem project component would be **less than significant**.

Off-Site Improvements

The proposed project includes two off-site improvements that would take place at the City of Vallejo Municipal Marina located approximately 2 miles north of the project site (public access improvements and removal of existing deteriorated docks). The public access improvements would involve installation of a new self-propelled personal watercraft launch ramp just north of the access ramp to K Dock at the south end of the marina. The proposed launch would consist of a pre-cast articulated concrete mat, approximately 10 feet wide by 60 feet long over a geotextile fabric. Installation of the launch ramp would occur within the existing marina. The project would also involve the removal of existing deteriorated dock improvements within the water area at the north end of the marina. Approximately eighty (80) 14-inch-diameter creosote timber piles and deteriorated dock facilities would be removed from this portion of the marina. Timber removed from the existing docks and the creosote timber piles would be separated based on recyclability. Recyclable and non-recyclable material would be sent to the closest appropriate facility.

As described previously and in Section 3.3, Biological Resources, the removal of decaying creosote pilings would result in resuspended contaminated sediment and release of toxic piling fragments into the water column and exposing fish and invertebrate taxa which can be fatal and/or harmful to marine invertebrates, fish, and marine mammals. Use of excavators, backhoes, and other mechanical means to physically grab onto and attempt to free the piling from the seafloor generally results in the piling disintegrating into wood fragments, exposing previously unweathered PAH-laden creosote to the marine environment.

All in-water construction activities would be required to comply with USACE, EPA, RWQCB, and BCDC regulations and provisions in issued permits including BMPs for avoiding or reducing potential impacts related to resuspended sediments. However, impacts related to the potential release of PAH-laden creosote piling fragments would remain **significant (Impact 3.8-2),** and mitigation is provided in Section 3.8.5.

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

VMT and Orcem Project Analysis

Construction Impacts

The project would not use groundwater as a source of construction-related water supply (e.g., dust control, foundation preparations, worker needs). Although groundwater is not expected to affect project construction, dewatering during the construction period could be required. However, the dewatering would only result in a temporary and highly localized effect on the uppermost water-bearing zones related to near-surface excavations. This water-bearing zone is shallow, highly saline, and not accessed by adjacent property owners as a source of water supply. Therefore, the impacts of project construction with respect to groundwater would be **less than significant**.

Operational Impacts

The project would not use the groundwater for water supply. In the project operational phase, water supply would be provided by the City of Vallejo municipal water system. According to the City's Urban Water Management Plan, its supplies are derived solely from lakes, diversions, retail purchases and other surface water rights; none of the supply comes from groundwater (City of Vallejo 2006). Therefore, project operation would neither directly or indirectly affect groundwater supplies or lower the local groundwater table. Furthermore, as shown in Table 3.8-4, the weighted impermeability factor of the site would not substantially change. Because the project would include vegetated swales and promote stormwater infiltration over runoff, it would not interfere substantially with groundwater recharge. Therefore, the impacts of project operation with respect to groundwater would be **less than significant**.

Off-Site Improvements

The proposed project includes two off-site improvements that would take place at the City of Vallejo Municipal Marina located approximately 2 miles north of the project site (public access improvements and removal of existing deteriorated docks). Implementation of the proposed off-site improvements would not result in the use of groundwater or interfere with groundwater recharge. **No impact** would occur.

C) Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?

VMT Analysis

Construction and Operational Impacts

A new stormwater drainage system compliant with mandatory NPDES requirements is proposed to replace/abandon the existing non- compliant system. According to Appendix J-1, the VMT project component would result in a decrease in impervious surface coverage and a reduction in the amount of water discharged into the Mare Island Strait compared to existing conditions.

A 10-year storm event is expected to produce runoff of 8.2 cubic feet per second (cfs) at its peak (Appendix J-1). The proposed bio-basin has been sized for a capacity of 13.0 cfs (without consideration for infiltration). In the pre-development condition, sheet runoff flows directly to the banks of the Mare Island Strait. In the post-development condition, all on-site runoff is directed to the vegetated swales, storm drain system, and bio-basin for detention and filtration (see Figure 3.8-2). In the event that a storm occurs that is larger than the capacity of the stormwater drainage system (approximately a 10-year storm), stormwater runoff would be released overland from the project site and adjacent property and into Mare Island Straight. The Phase 1 wharf and Phase 2 dike, along with the new area of engineered fill would not substantially change the course of the Mare Island Strait, because the proposed area of fill would be located on the shallow tidal flat and would not encroach upon the deep-water channel.

The VMT project component would change drainage patterns, but would do so in a manner that better handles stormwater runoff compared to existing conditions. The SWPPP discussed under criterion A discusses how the proposed project would minimize erosion or siltation. Therefore, the impacts with respect to alteration of drainage patterns would be **less than significant**.

Orcem Analysis

Construction and Operational Impacts

The Orcem project component would not significantly alter site drainage patterns. Runoff from the site would discharge into the stormwater drainage system, and locations of surface conveyance gutters and drain inlets would be modified to accommodate the grading and drainage for the new site design. The change in drainage patterns would not result in substantial erosion or siltation on site or off site. Project BMPs would prevent substantial erosion and siltation for the construction (e.g., erosion control requirements for earth-moving activities) and post-construction phases (e.g., stormwater runoff treatment before it discharges into the stormwater drainage system). In addition, the Orcem project component would comply with the City's requirement to submit a Grading and Erosion Control Plan, which would minimize erosion and siltation during construction. As described under criterion A, because the proposed Orcem drainage system has been adequately designed to handle runoff in a manner that would not violate water quality objectives, and because a SWPPP would be prepared for the operational phase of the project in compliance with NPDES permitting requirements (GIP 2014-0057-DWQ), the operational impacts of the Orcem project component would be **less than significant**.

Off-Site Improvements

As described earlier, the proposed project includes two off-site improvements associated with the VMT component of the project that would take place at the City of Vallejo Municipal Marina located approximately 2 miles north of the project site (public access improvements and removal of existing deteriorated docks). The installation of the ramp would involve the construction of a cast-in-place concrete apron that would provide the transition to the articulated concrete mat. The proposed cast-in-place and prefabricated improvements would replace primarily riprap and gravel surfaces and would result in a small area of cover. Removal deteriorated dock facilities would not result in changes to drainage patterns at the Municipal Marina. Since proposed off-site improvements would not significantly alter drainage patterns or result in siltation, impacts would be **less than significant.**

D) Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

VMT and Orcem Project Analysis

As discussed under threshold C, the project would change drainage patterns, but would do so in a manner the better handles stormwater runoff compared to existing conditions.

The proposed project would allow for overland release of surface runoff in excess of design storm event, and/or in case that flooding occurs during a smaller storm resulting from debris clogging in the downstream stormwater drainage system. In the existing condition, overland release of such flows is conveyed through the adjacent property to the west and into Mare Island Strait. There would be no change in the drainage pattern for overland release of flood water with implementation of the proposed project. Furthermore, there would be no habitable structures, nor any bulky structures with significant cross-sectional area, within the 100-year flood plain on the VMT Site. Therefore, the proposed project impacts on flooding as a result of changes in drainage patterns would be **less than significant**.

Off-Site Improvements

As described earlier, the proposed project includes two off-site improvements that would take place at the City of Vallejo Municipal Marina located approximately 2 miles north of the project site (public access improvements and removal of existing deteriorated docks). The public access ramp and dock removal improvements would not substantially alter existing drainage patterns through the alteration of a stream or river course or increase surface runoff in a way that could result in flooding on or off site. Impacts would be **less than significant.**

E) Would the project create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

VMT and Orcem Project Analysis

The existing 30-inch discharge culvert and the entire site’s storm drain system of unknown capacity would be abandoned or removed. Existing outfalls may be reused and/or upgraded as necessary, subject to current standards. According to Appendix J-2 and Appendix J-3, the system appears outdated and non-compliant with the current NPDES requirements described in Section 3.8.1. The Orcem project component would include appropriately sized storm drain systems with both volume- and flow-based design treatment systems (retaining media/sand filters), as well as rainwater harvesting/reuse LID tanks, which would decrease peak discharge rates compared with the existing system conditions. The potential for the project to provide additional sources of polluted runoff is discussed above under criterion A. Therefore, implementation of the proposed project would not exceed capacity of the existing or planned stormwater drainage system, and the impacts would be **less than significant**.

Off-Site Improvements

As described earlier, the VMT component of the proposed project includes two off-site improvements that would take place at the City of Vallejo Municipal Marina located approximately 2 miles north of the project site (public access improvements and removal of existing deteriorated docks). Removal of the deteriorating dock structures would not create or contribute any new sources of runoff. The proposed launch ramp would constitute a small surface area, the majority of which would be located below the surface of the Bay, and would not contribute surface runoff to any stormwater drainage system. Impacts would be **less than significant**.

F) Would the project otherwise substantially degrade water quality?

VMT and Orcem Project Analysis

Water quality issues associated with the project, including potential degradation of water quality, have been comprehensively addressed under criteria A–E. The proposed project would not otherwise degrade water quality, and **no impact** would occur.

Off-Site Improvements

The potential impact of the proposed off-site improvements to water quality is comprehensively addressed under thresholds A–E. The off-site improvements would not otherwise degrade water quality. Therefore, **no impact** would occur.

G) Would the project place within a 100-year flood hazard area structures which would impede or redirect flood flows?

VMT and Orcem Project Analysis

As indicated in Figure 3.8-1, the 100-year floodplain is limited to areas of the VMT Site where no permanent habitable structures are proposed. Although the project would place fill within the Mare Island Strait, it would not expose habitable structures to 100-year flood flows. Therefore, impacts would be **less than significant**.

Off-Site Improvements

As described earlier, the proposed project includes two off-site improvements that would take place at the City of Vallejo Municipal Marina located approximately 2 miles north of the project site (public access improvements and removal of existing deteriorated docks). The installation of the proposed personal watercraft ramp and removal of deteriorating dock structures would not impede or redirect flood flows. Impacts would be **less than significant**.

H) Would the project 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?

VMT and Orcem Project Analysis

As indicated under threshold G and depicted on Figure 3.8-1, the 100-year floodplain is limited to areas of the VMT Site where no permanent habitable structures are proposed. Although the project would place fill within the Mare Island Strait, it would not place people or the public at risk because it would consist of loading/unloading areas. Furthermore, the fill would be placed in the shallow tidal area and would not encroach upon the strait's deep-water channel. Impacts would therefore be **less than significant**.

Off-Site Improvements

The proposed project includes two off-site improvements that would take place at the City of Vallejo Municipal Marina located approximately 2 miles north of the project site (public access improvements and removal of existing deteriorated docks). The proposed public launch ramp would be located partially in the water, and any potential flooding could reduce the area available for launching boats. However, given the proposed use of the ramp as a watercraft launching facility, potential flooding would not expose people or structures to significant risk. Similarly, the removal of the existing docks would not expose people or structures to risk from flooding. The proposed off-site improvements would therefore not expose people or structures to risk related to flooding including the failure of a levee or dam. Impacts would be **less than significant**.

I) Would the project be at risk for inundation by seiche, tsunami, or mudflow?

VMT and Orcem Project Analysis

As discussed in Section 3.8.2, the extent of inundation from a tsunami is expected to be less than that of a 100-year flood. The site would not be subject to seiche because is it not next to an enclosed body of water (e.g., lake or pond). Mudflow is not expected to be an issue on the site due to the character of soil and rock slopes adjacent to the site; the potential for landslides and rockfalls are addressed in Section 3.5, Geology and Soils. The impact is therefore **less than significant**.

Off-Site Improvements

The proposed project includes two off-site improvements that would take place at the City of Vallejo Municipal Marina located approximately 2 miles north of the project site (public access improvements and removal of existing deteriorated docks). The site would not be subject to seiche because is it not next to an enclosed body of water (e.g., lake or pond). The Municipal Marina is located within a Tsunami Inundation Area and would be at risk of inundation in the event of a tsunami (CalEMA 2009b). However, since the proposed off-site improvements would be located partially under water and would be used for water access, the risks associated with tsunami would not be significant. Mudflow is not expected to be an issue on the site due to the character of soil and rock slopes adjacent to the site. Impacts would therefore be **less than significant**.

3.8.5 Mitigation Measures

Mitigation for Impact 3.8-1: Construction of the VMT component of the project would result in a significant impact due to potential impacts on marine water quality from material dredging, removal of creosote pilings, reuse of materials from on-site demolition activities, and use of Class II aggregate for riprap.

MM-3.8-1 **Dredged Material Management Plan.** Prior to both Phase 1 and Phase 2 of the VMT project component, the applicant shall develop a dredged material management plan to outline procedures necessary to evaluate the suitability of dredged materials for either on-site beneficial reuse or in-bay disposal at the Carquinez disposal or other approved site. The purpose of the plan shall be to ensure that dredged materials are handled in a manner that is consistent with the San Francisco Bay Long-Term Management Strategy for Dredging developed cooperatively by the U.S. Environmental Protection Agency (EPA), U.S. Army Corps of Engineers (USACE), the San Francisco Regional Water Quality Control Board (RWQCB), and the Bay Conservation and Development Commission (BCDC). The plan shall include screening and testing guidelines necessary to ensure dredged materials may be reused on-site without resulting in potentially adverse impacts on water quality and aquatic biota.

The dredged material management plan shall be prepared and implemented by a qualified professional geochemist or water quality expert with relevant Bay-Delta project experience. In consultation with San Francisco Bay RWQCB and BCDC staff, and in consideration of the applicable water quality objectives and known water quality impairments within receiving waters, the plan shall outline the type and frequency of testing that would be required as materials are dredged out of the Bay. The plan shall develop site-specific thresholds that would indicate the material is suitable for on-site reuse using input from the San Francisco Bay RWQCB and the following document: *Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines*. Testing protocols from *Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. – Testing Manual (Inland Testing Manual)* shall also be incorporated into the plan where applicable.

The USACE, the San Francisco Bay RWQCB, and the BCDC shall have review and approval authority over the plan. During dredging operations, the applicant shall submit monthly reports to each agency describing the volume and destination (i.e., on-site, in-bay, or ocean) of dredged materials, with testing results justifying the decision.

MM-3.8-2 **Riprap and Aggregate Sourcing.** Prior to construction of wharf and dike improvements, the applicant shall disclose to the U.S. Army Corps of Engineers (USACE), the San Francisco Bay Regional Water Quality Control Board (RWQCB), and the Bay Conservation and Development Commission (BCDC) the source and volume of the Class II aggregate and riprap to be used in construction of the rock dike and backfill materials. For materials proposed to be reused from on-site demolition activities, the applicant shall demonstrate to the satisfaction of the agencies that such reuse would not result in release or leaching of contaminants into the water column. The applicant shall describe screening and testing procedures to be used to ensure that rock and aggregate materials do not contain legacy contaminants that could violate water quality objectives or result in substantial adverse impacts on aquatic biota when placed along the shoreline. All materials to be used in the construction of the riprap dike and shoreline backfill shall be subject to approval by the San Francisco Bay RWQCB, and the BCDC.

Refer to **MM-3.3-3** and **MM-3.3-4** in Section 3.3, Biological Resources.

Mitigation for Impact 3.8-2: The removal of the deteriorated docks located at the northern end of the City of Vallejo Municipal Marina could result in significant impacts to water quality related to removal of creosote pilings.

Refer to **MM-3.3-3** in Section 3.3, Biological Resources.

3.8.6 Level of Significance After Mitigation

Impact 3.8-1: With implementation of mitigation measures MM-3.8-1, MM-3.8-2, MM-3.3-3, and MM-3.3-4, Impact 3.8-1 would be reduced to a **less-than-significant** level. Implementation of MM-3.8-1 and MM-3.8-2 would ensure that dredged materials as well as on-site concrete (associated with existing buildings) would be tested prior to on-site reuse as engineered fill, and would minimize the potential for mobilization of impurities and/or organic or inorganic contaminants in stormwater runoff or leaching into marine waters. Furthermore, measures to minimize impacts to aquatic life in the intertidal zone would include a creosote piling removal plan (MM-3.3-3), and an in-water construction/deconstruction pollution prevention plan (MM-3.3-4). MM-3.3-3 and MM-3.3-4 together would minimize the potential for in-water construction activities to adversely affect water quality by training workers, recovering debris, and ensuring the proper placement and use of containment booms.

Impact 3.8-2: Implementation of MM-3.3-3 (Section 3.3, Biological Resources) would require a creosote piling removal plan, which would ensure that impacts related to removal of the creosote piles at the City's Municipal Marina would be reduced to a **less-than-significant** level.

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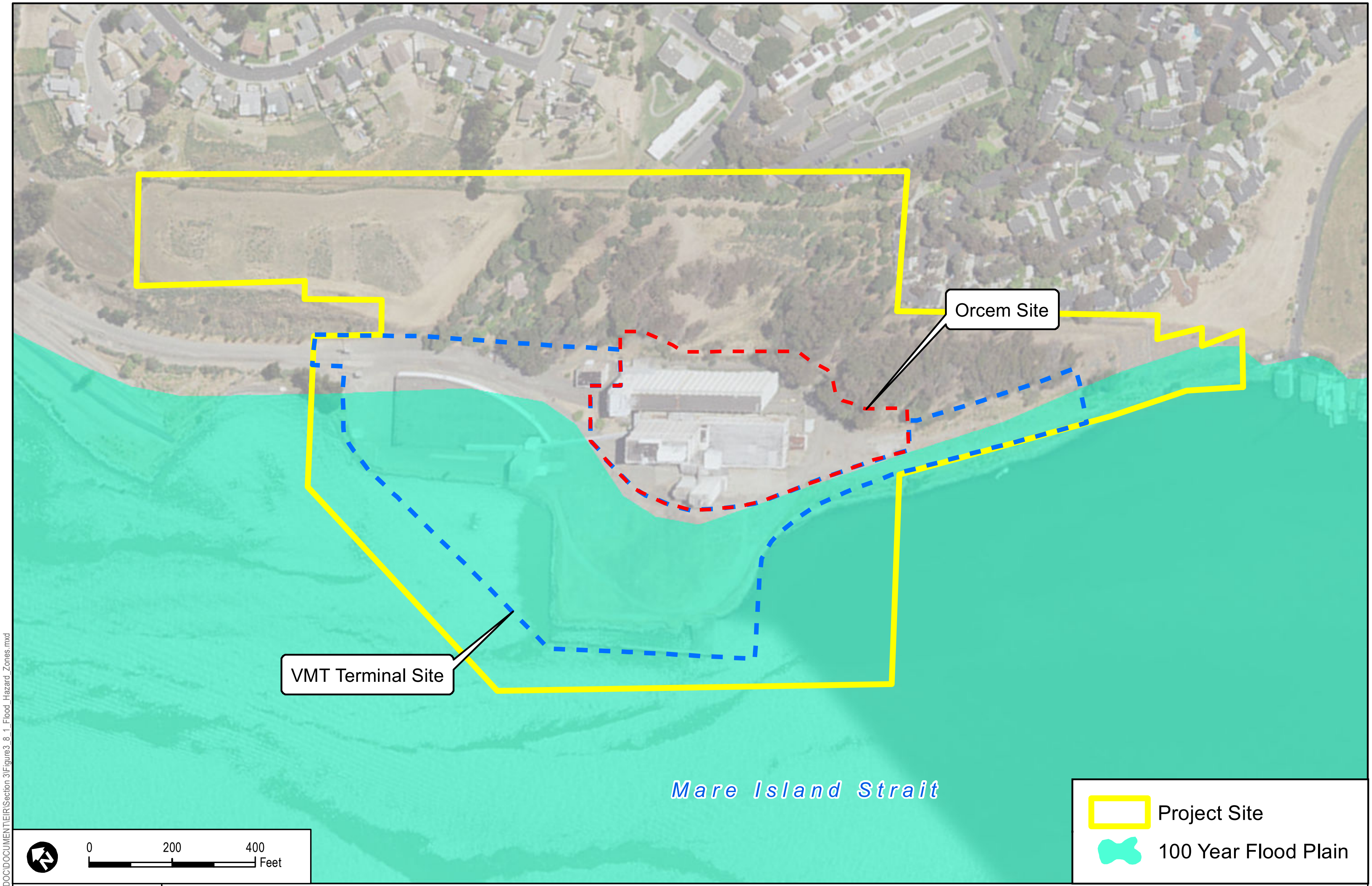

DUDEK

8301

SOURCE: Bing 2014, FEMA 2014

VALLEJO MARINE TERMINAL AND ORCEM PROJECT DRAFT EIR

FIGURE 3.8-1

Flood Hazard Zones

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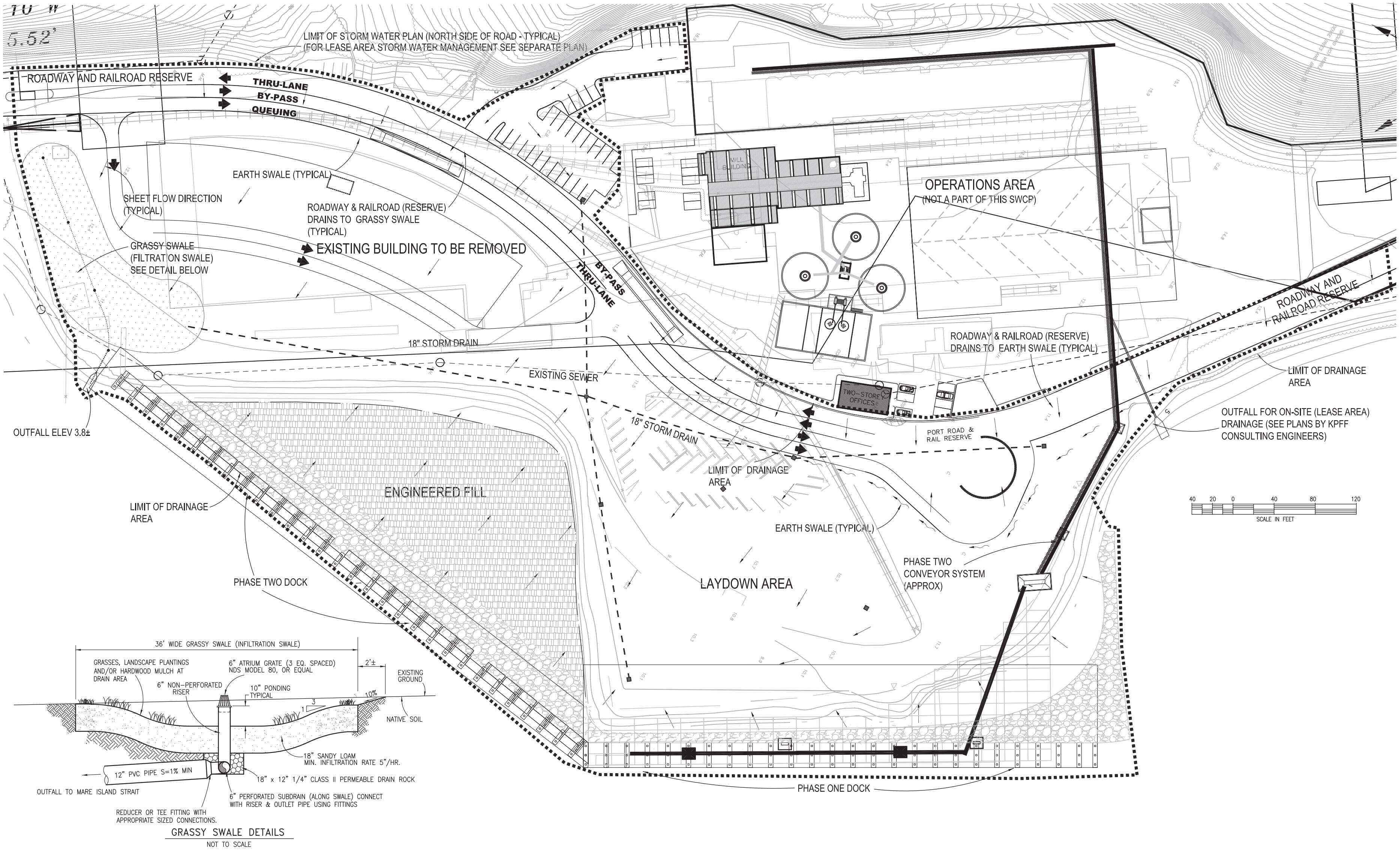

SOURCE: Meridian Associates, Inc. 2014

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FIGURE 3.8-2

VTM Preliminary Stormwater Management Plan

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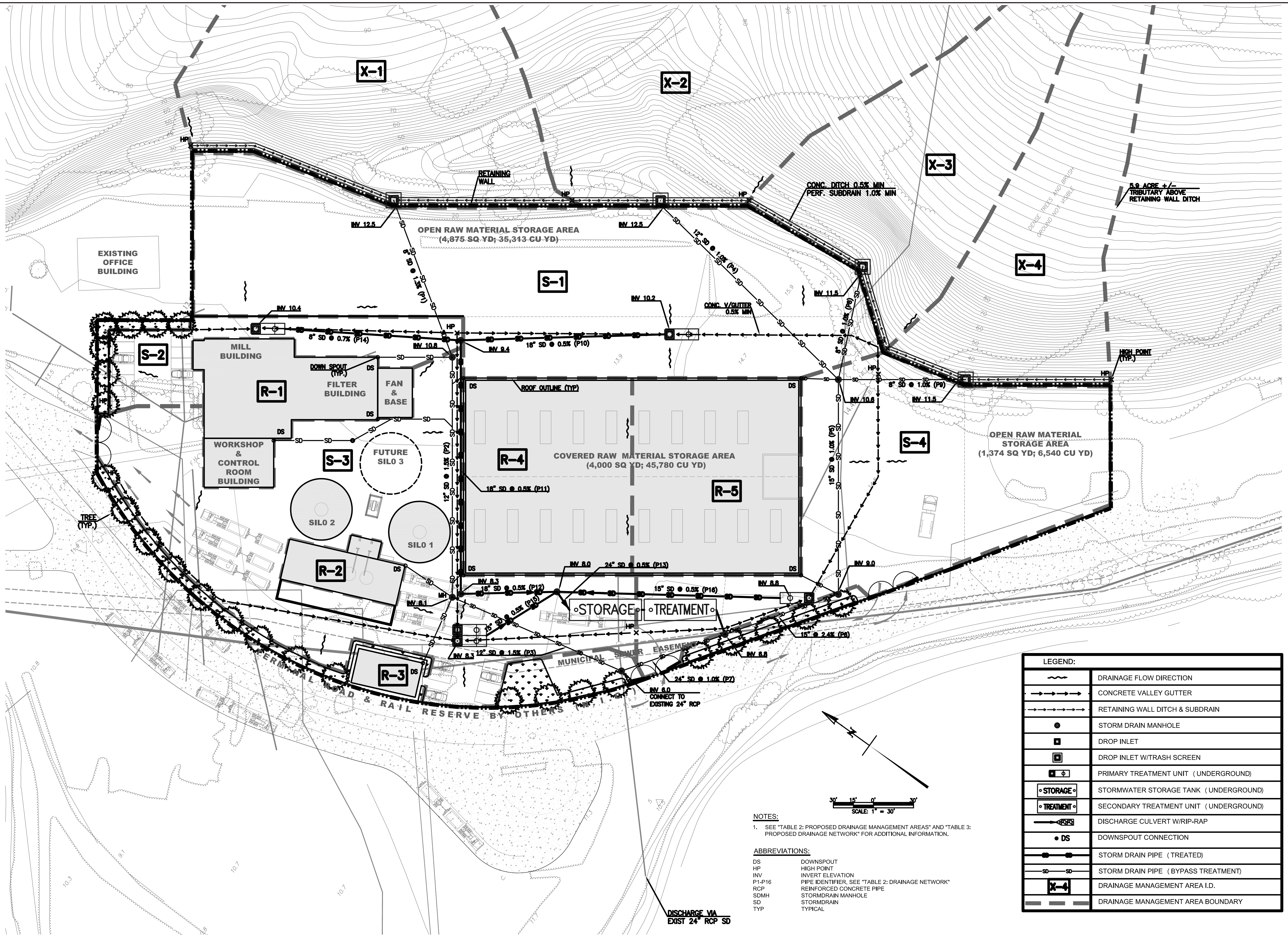

NOTES:

1. SEE "TABLE 2: PROPOSED DRAINAGE MANAGEMENT AREAS" AND "TABLE 3: PROPOSED DRAINAGE NETWORK" FOR ADDITIONAL INFORMATION.

ABBREVIATIONS:

DS	DOWNSPOUT
HP	HIGH POINT
INV	INVERT ELEVATION
P1-P16	PIPE IDENTIFIER, SEE "TABLE 2: DRAINAGE NETWORK"
RCP	REINFORCED CONCRETE PIPE
SDMH	STORMDRAIN MANHOLE
SD	STORMDRAIN
TYP	TYPICAL

LEGEND:

~	DRAINAGE FLOW DIRECTION
→→	CONCRETE VALLEY GUTTER
→→→	RETAINING WALL DITCH & SUBDRAIN
●	STORMDRAIN MANHOLE
▣	DROP INLET
▣	DROP INLET W/TRASH SCREEN
▣ ◈	PRIMARY TREATMENT UNIT (UNDERGROUND)
○STORAGE○	STORMWATER STORAGE TANK (UNDERGROUND)
○TREATMENT○	SECONDARY TREATMENT UNIT (UNDERGROUND)
→	DISCHARGE CULVERT W/RIP-RAP
● DS	DOWNSPOUT CONNECTION
—SD—	STORM DRAIN PIPE (TREATED)
—SD—	STORM DRAIN PIPE (BYPASS TREATMENT)
X-4	DRAINAGE MANAGEMENT AREA I.D.
— —	DRAINAGE MANAGEMENT AREA BOUNDARY

SOURCE: KPFF CONSULTING ENGINEERS 2015

FIGURE 3.8-3

ORCEM Drainage Plan

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3.9 LAND USE AND PLANNING

This section analyzes the potential impacts of the Vallejo Marine Terminal (VMT) and Orcem project (proposed project) with respect to land and water uses and recommends mitigation measures where necessary to reduce or avoid significant impacts.

3.9.1 Regulatory Setting

Federal

There are no federal land use and planning regulations applicable to the proposed project.

State

San Francisco Bay Conservation and Development Commission

The San Francisco Bay Conservation and Development Commission (BCDC) is a state agency that was created as a temporary agency by the McAteer-Petris Act in 1965. In 1969, the McAteer-Petris Act was amended to make BCDC a permanent agency. BCDC regulates filling, dredging, and changes in use in San Francisco Bay. In addition, BCDC regulates new development within 100 feet of the shoreline to ensure the provision of public access to and along the Bay. BCDC is also responsible for ensuring that shoreline property suitable for regional high-priority water-oriented uses, such as ports, water-related industry, water-oriented recreation, airports, and wildlife areas, is reserved for these purposes (BCDC 2014). BCDC planning documents applicable to the project site are described below.

San Francisco Bay Plan

The San Francisco Bay Plan (Bay Plan), which was prepared by BCDC between 1965 and 1969 and most recently amended in 2012, guides the protection and use of the Bay and its shoreline. BCDC has permit jurisdiction over shoreline areas subject to tidal action up to the mean high tide line and including all sloughs, tidelands, submerged lands, and marshlands lying between the mean high tide and 5 feet above mean sea level for the nine Bay Area counties with Bay frontage, and the land lying between the Bay shoreline and a line drawn parallel to, and 100 feet from, the Bay shoreline, known as the 100-foot shoreline band. The Bay Plan provides policy direction for BCDC's permit authority regarding the placement of fill; extraction of materials; determining substantial changes in use of land, water, or structures within its jurisdiction; protection of the Bay habitat and shoreline; and maximizing public access to the Bay (BCDC 2012).

Part II of the Bay Plan includes the following overarching objectives (BCDC 2012):

- Objective 1: Protect the Bay as a great natural resource for the benefit of present and future generations.
- Objective 2: Develop the Bay and its shoreline to their highest potential with a minimum of Bay filling.

Parts III and IV of the Bay Plan contain findings and policies pertaining to the natural resources of the Bay and development of the Bay and shoreline, respectively. The specific policies applicable to the proposed project are discussed in detail in Section 3.9.4, Impact Discussion.

The project site is included on Bay Plan Map 2: Carquinez Strait, within the Vallejo Water-Related Industrial Area (6), which is designated "Water-Related Industry" (BCDC 2012). Bay Plan Policies for Area 6 indicate that "some fill may be needed" within this area in order to fully accommodate the planned and desired land uses, and to create commercially viable use of the shoreline. Mare Island Strait is identified as a "Certain Waterway" on the Bay Plan, which provides navigable water access to the designated "Vallejo Water-Related Industrial Area" including the project site.

Shoreline Spaces: Public Access Design Guidelines for the San Francisco Bay

The BCDC Public Access Design Guidelines provide guidance for site planning and design of public access areas associated with development projects along the shoreline of the San Francisco Bay. The Public Access Design Guidelines is an advisory document based on the Bay Plan policies and is intended to facilitate the design of projects that are consistent with BCDC's policies regarding public access. The following seven public access objectives are provided to help achieve the goal of providing "maximum feasible public access, consistent with the project" (BCDC 2005):

1. Make public access PUBLIC.
2. Make public access USABLE.
3. Provide, maintain and enhance VISUAL ACCESS to the Bay and shoreline.
4. Maintain and enhance the VISUAL QUALITY of the Bay, shoreline and adjacent developments.
5. Provide CONNECTIONS to and CONTINUITY along the shoreline.
6. Take advantage of the BAY SETTING.
7. Ensure that public access is COMPATIBLE WITH WILDLIFE through siting, design and management strategies.

Bay Area Seaport Plan

The San Francisco Bay Area Seaport Plan is a joint regional policy document of BCDC and the Metropolitan Transportation Commission (MTC) that was adopted in 1996 and last amended in 2012. It is the maritime element of MTC's Regional Transportation Plan and provides more detailed policy direction that extends from the Bay Plan's Port policies. The Seaport Plan contains policies for existing and future waterfront areas reserved for cargo terminals and port-priority uses, based on economic forecasts and projected future needs of Bay Area ports (BCDC and MTC 2012).

California Local Agency Formation Commission

The legislature has charged the Local Agency Formation Commission (LAFCO) with carrying out changes in governmental organization to promote specified legislative policies codified in the Cortese-Knox-Hertzberg Local Government Reorganization Act of 2000. The Cortese-Knox-Hertzberg Act commences with Section 56000 of the Government Code, specifically sections 56001, 56300, 56301, 56375, 56377, and 56668. These sections contain the following major policy elements:

1. Orderly Growth. LAFCO is charged with encouraging orderly growth and development. Providing housing for persons and families of all incomes is an important factor in promoting orderly development.
2. Logical Boundaries. LAFCO is responsible for encouraging the logical formation and determination of boundaries.
3. Efficient Services. LAFCO must exercise its authority to ensure that affected populations receive adequate, efficient, and effective governmental services.
4. Preserve Agricultural and Open Spaces. LAFCO is required to exercise its authority to guide development away from open space and prime agricultural land uses unless such actions would not promote planned, orderly, and efficient development.

The proposed project includes a request to annex the 5.25-acre portion of the project area that is outside the City limits. The proposed boundary change would require approval from Solano County LAFCO. This portion of the project site has historically been a part of the former General Mills site and is within the fenced area of the site.

Local

Plan Bay Area

Plan Bay Area, a long-range land use and transportation strategy for the San Francisco Bay Area, was approved by the Association of Bay Area Governments (ABAG) and MTC on July 18, 2013. ABAG is the regional planning agency for the 9 counties and 101 cities and towns within the San Francisco Bay region. The plan includes the region’s first Sustainable Communities Strategy and the 2040 Regional Transportation Plan. The plan provides a strategy for meeting 80% of the region’s future housing needs in Priority Development Areas (PDAs), which are defined as neighborhoods that offer a wide variety of housing options within walking distance of transit and amenities such as grocery stores, community centers, and restaurants. Identified by cities and towns across the region, the PDAs range from regional centers such as downtown San Jose to suburban centers such as Walnut Creek’s west downtown area, and smaller town centers such as the Suisun City Waterfront. The plan funds mixed-income housing production and locally-led planning in PDAs.

City of Vallejo General Plan

The Vallejo General Plan, adopted in July 1999, establishes the goals and policies guiding land use and development within the City’s Planning Area, which includes lands within the City limits and lands outside the City limits but within the City’s Sphere of Influence (SOI). The entire project site is located within the City’s Planning Area, including 5.25 acres that are located outside the City limits in the City’s SOI. The portion of the project site within the City limits is designated “Employment” and the portion of the project site located outside the City limits is designated “Open Space-Community Park” (City of Vallejo 1999).

The following goals and policies are applicable to the proposed project.

Waterfront Development Goal: To have a waterfront devoted exclusively to water oriented uses, including industrial, residential, commercial and open space uses, which permit public access.

- *Policy 1:* BCDC’s Public Access Design Guidelines should be used in reviewing all development proposals. In areas hazardous to public safety or incompatible with public use, in-lieu access at another nearby location may be provided.
- *Policy 3:* The following public access to and along public waterways, streams and rivers is required where feasible:
  a. Access to the water every 1,500 feet;
  b. Accessway to be a minimum of 50 feet wide;

c. Access along the~~:~~ water to be a minimum of-200 feet in width;

d. Planned Developments and commercial and industrial areas may vary provided they are within the intent and purpose of this provision.

Industrial Development Goal 2: To have a higher percentage of residents working in the Vallejo area.

- *Policy 1:* Review large vacant acreages for potential development; existing industrially zoned areas should not be rezoned unless the zoning is inappropriate.

Industrial Development Goal 3: To insure compatibility between industrial land uses and uses of a lesser intensity.

- *Policy 1:* Where possible, natural buffers, e.g., railroad tracks, major street, or abrupt topographic changes should be used to delineate industrial areas.

Industrial Development Goal 4: To maximize the potential of industrially zoned lands for the fostering of new and innovative industrial development.

- *Policy 1:* Use the Planned Development approach in those areas where industrial uses will be compatible with accessory residential and/or commercial uses.

Circulation and Transportation, Compatibility with Adjoining Land Uses Goal: To have a street and highway system that services all land uses with a minimum adverse impact.

- *Policy 3:* All truck traffic and regional bus service should be restricted to peripheral major streets and north-south, east-west arterial and collector streets having the least number of residences and schools. Only small trucks servicing the neighborhood centers should be allowed on other streets. Where possible, unloading facilities should be provided off alleys rather than streets.

Public Facilities and Other Services, Other Services Goal: To provide an efficient and financially sound system of urban services to protect the health, safety and general welfare of Vallejo area residents.

- Policy 5: Prior to annexation to the City, a Specific Area Plan and Environmental Impact Report should be conducted. A cost/revenue impact study should be undertaken to determine the cost of providing public services.

Air Quality Goal 1:

- Policy 2: Balance jobs and housing in future development to provide Vallejo residents the opportunity to work within Vallejo, and reduce long distance commuting both to and from Vallejo. Jobs and housing should be balanced both in numbers and in salary range/housing cost.

Air Quality Goal 2: To reduce the air quality impact associated with future development in Vallejo.

- *Policy 3:* Require air quality mitigation for new development not amenable to TSM [Transportation Systems Management] methods. Retail commercial and residential development, in particular, do not lend themselves to trip reduction through TSM. As part of the environmental review process these types of uses should be required to provide air quality mitigation by providing funding for off-site improvements to improve air quality. Examples of such improvements are pedestrian/bicycle amenities, transit support, transit amenities such as bus shelters, or additional park-and-ride lots.
- *Policy 4:* Use project siting to reduce air pollution exposure of sensitive receptors. Locate air pollution sources away from residential areas and other sensitive receptors. Include buffer zones within residential and sensitive receptor site plans to separate these uses from freeways, arterials, point sources and potential sources of odors.

Fish and Wildlife Resources Goal: To protect valuable fish and wildlife habitats.

- *Policy 5:* Recognize areas valuable for marine life productions, particularly the Napa Marshes and Carquinez Strait, and work with the California Department of Fish and Game and Bay Conservation and Development Commission in insuring the protection of these areas from incompatible uses.

Noise Goal: To provide for a more pleasing acoustic environment for the city by controlling noise levels in a manner that is acceptable to the residents, reasonable for commercial and industrial land uses, and practical to enforce.

- *Policy 2:* Roadways should be kept in good repair and new surface material should be evaluated in terms of noise generation.

Floodplain Hazards Goal: To protect life, property, and public well being from seismic, floodplain, and other environmental hazards and to reduce or avoid adverse economic, social, and physical impacts caused by existing environmental conditions.

- *Policy 3:* Evaluate all new developments to determine how peak runoff can be delayed using such measures as detention or retention basins, permanent greenbelt areas, temporary underground storage, permeable paving and roof top ponding.

City of Vallejo Zoning Code

The portion of the project site within the City limits is zoned "Intensive Use," while the 5.25-acre portion of the project site located outside the City limits does not have a City zoning designation. The Intensive Use zoning district is Vallejo's heaviest industrial district and currently applies to the balance of the project site. As detailed in Chapter 16.34 of the City's Zoning Code, "General Industrial Uses" are "Permitted Uses" (Section 16.34.020.C.2), whereas "Heavy Industrial Uses" are permitted upon the issuance of a major use permit (Section 16.34.040.B.1). Code Section 16.06.530 (Article V) classifies "General Industrial Uses" as consisting of "industrial plants engaged in manufacturing, compounding, processing, assembling, packaging, treatment or fabrication of materials and products." It classifies "Heavy Industrial Uses" as "all other plants" or any such plant which "involves the compounding of radioactive materials, petroleum refining or manufacturing of explosives."

Solano County General Plan and Zoning Ordinance

The Solano County General Plan, adopted in 2008, is a long-range guide for land use in the unincorporated areas in the county, including land outside of Vallejo's city limits but within the City's SOI. The City's SOI includes incorporated city lands and unincorporated county lands that may be considered for future annexation by the City. The City's SOI is regulated by the Solano County LAFCO, which determines the unincorporated land that would be best and most likely be served by city agencies, and which may be annexed to the City.

The 5.25-acre portion of the project site located outside the Vallejo city limits is designated "Park and Recreation" in the Solano County General Plan (County of Solano 2008). The County zoning designations for the 5.25-acre portion of the site are RTC-6 (Residential Traditional Community 6,000 square feet) and CR (Commercial Recreation) (County of Solano 2014). As described above, this vacant portion of the site is proposed to be annexed to the City as part of the proposed project. Once property is annexed into the City, future development would be subject to the standards prescribed by the City's General Plan, Municipal Code, and other City regulations.

3.9.2 Existing Conditions

The project site contains the former General Mills deep-water terminal and buildings associated with the former General Mills plant. The General Mills plant closed in 2004, and the project site has since remained vacant. Table 3.9-1 below identifies the former General Mills buildings and equipment located on the project site, together with their approximate sizes and year of construction. The existing structures listed in Table 3.9-1 vary in height from one to eight stories, and in footprint size up to approximately 42,500 square feet, comprising a total of approximately 211,460 square feet of floor area. The location of these structures is shown on Figure 2-1 of this EIR.

Table 3.9-1
Existing General Mills Structures

Figure 2-1 Reference	Structure	Type	Footprint (square feet)	Floor Area (square feet)	Year Built
1	Grain Silos & Elevator	Equipment	17,700	17,700	1917
2	Flour Mill	Building	35,000	134,000	1917
3	Old Bulkhouse	Building	1,200	1,200	1957
4	New Bulkhouse	Building	1,100	1,100	1985
5	Welding Shop	Building	400	400	1985
6	Pipe Storage	Building	600	600	1985
7	Forklift Repair	Building	300	300	1985
8	Mill Run Canopy (structure removed in 2012)	Building	0	0	1986
9	Administrative Bldg.	Building	2,100	4,200	1917
10	Garage	Building	1,910	1,910	1918
11	Warehouse	Building	42,500	42,500	1947
12	Bakery Bulkhouse	Building	4,700	4,700	1992
13	Manager’s House	Building	985	1,970	1901–1919
14	Manager’s Garage	Building	380	380	1950s
15	Barn	Building	500	500	1901–1919
16	Dock (Wharf)	Structure	0	0	1901–1919

The project site is bounded by the Mare Island Strait to the west, a steep hillside to the east, rail lines and existing industrial uses to the north, and undeveloped areas to the south. Residential uses are located east and southeast from the site. The residential uses include the Bay Village Townhouses to the southeast, Harbor Park Apartments and single-family residences to the northeast, and single-family homes to the south along the water front (the Sandy Beach community), just outside the City boundary.

3.9.3 Thresholds of Significance

The following criteria, included in Appendix G of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.), will be used to determine the significance of potential land use and planning impacts. Impacts to land use and planning would be significant if the proposed project would:

A) Physically divide an established community;

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

3.9.4 Impact Discussion

A) Would the project physically divide an established community?

VMT and Orcem Project Analysis

The proposed project would be developed on the site of the former General Mills deep-water terminal and processing plant. The site has been vacant since 2004 when General Mills closed the plant. As described in the Existing Conditions section, the project site is bounded by the Mare Island Strait to the west, a steep hillside to the east, rail lines and existing industrial uses to the north, undeveloped areas to the south, and residential uses to the east and southeast. Access to the project site is provided from Derr Avenue, which extends south from Lemon Street and dead-ends at the project site. The surrounding communities are separated from the project site by water, steep hillsides, and distance.

Construction of the proposed project would involve demolition of existing structures and construction of new structures, both in the water and on land. Construction of these facilities would not physically divide any established communities since it would occur within the 39.1-acre project site, which has been vacant since 2004. Similarly, operation of the proposed project would occur primarily on site. Operations would involve transport of materials by truck, train, and/or ocean-going vessels. The trucks and trains would travel through surrounding communities on existing routes and would not require new routes to be added that could potentially divide a community. For these reasons, construction and operations the proposed project would not physically divide an established community, and **no impact** would occur.

Off-Site Improvements

The proposed project includes two off-site improvements that would take place at the City of Vallejo Municipal Marina located approximately 2 miles north of the project site: public access improvements and removal of existing deteriorated docks. The public access improvements would involve installation of a new self-propelled personal watercraft launch ramp just north of the access ramp to K Dock at the south end of the marina. The proposed launch would consist of a pre-cast articulated concrete mat, approximately 10 feet wide by 60 feet long over a geotextile fabric. Installation of the launch ramp would occur within the existing marina. The project would also involve the removal of existing deteriorated dock improvements within the water area at the north end of the marina. Approximately eighty (80) 14-inch-diameter creosote timber piles and deteriorated dock facilities would be removed from this portion of the marina. The personal watercraft launch ramp improvements would be located within the existing Municipal Marina and would be consistent with the Marina Master Plan. The removal of deteriorating docks would enhance the existing marina by ameliorating an existing issue. Neither action would divide an existing community. Impacts would be **less than significant**.

B) Would the project 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, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

VMT and Orcem Project Analysis

The proposed project is subject to several land use plans, policies, and regulations, including the Bay Plan, the City of Vallejo General Plan, and the City of Vallejo Zoning Ordinance. Table 3.9-2 lists the individual policies of plans determined to be applicable to the various components of the proposed project. A consistency determination is also provided for each applicable policy and regulation.

Table 3.9-2
Consistency of the Proposed Project with Relevant Goals, Objectives, and Policies

Goals, Objectives, and Policies	Analysis	Consistency
The Bay Plan		
Fish, Other Aquatic Organisms, and Wildlife		
Policy 1. To assure the benefits of fish, other aquatic organisms and wildlife for future generations, to the greatest extent feasible, the Bay's tidal marshes, tidal flats, and subtidal habitat should be conserved, restored and increased.	**VMT:** The VMT component of the project would involve the removal of a deteriorated timber wharf and construction of a modern deep-water terminal, including wharf improvements, which would impact subtidal habitat in the project area. As described in Section 3.3, Biological Resources, based on the small area affected, the loss of subtidal and intertidal habitat due to expansion of the wharf would not be significantly detrimental to the bay marine community. Following the deposition of fine sand-mud sediments due to dredging, recovery would begin almost immediately, and the benthic community inhabiting those sediments would be expected to recover to pre-dredging composition and abundances within a few months to less than 2 years. **Orcem:** The Orcem component of the project would not involve any changes to the Bay's tidal marshes, tidal flats, and subtidal habitat.	Consistent
Policy 2. Specific habitats that are needed to conserve, increase or prevent the extinction of any native species, species threatened or endangered, species that the California Department of Fish and Game has determined are candidates for listing as endangered or threatened under the California Endangered Species Act, or any species that provides substantial public benefits, should be protected, whether in the Bay or behind dikes.	**VMT:** The VMT component of the project would involve the removal of a deteriorated timber wharf and construction of a modern deep-water terminal, including wharf improvements, which would impact subtidal habitat in the project area. As described in Section 3.3, Biological Resources, the proposed wharf and dike construction and public access improvements would result in the permanent loss of approximately 2.74 acres of potential foraging habitat for sensitive fish species due to in-bay fill and shoreline modification for dike and wharf construction and the temporary degradation of an additional 12.1 acres due primarily to dredging; however, the substrate at the site is not considered to be of high quality as a foraging habitat and the incidence of sensitive fish species at the site is low. **Orcem:** The Orcem component of the project would not involve any changes to habitats within the Bay.	Consistent

Table 3.9-2
Consistency of the Proposed Project with Relevant Goals, Objectives, and Policies

Goals, Objectives, and Policies	Analysis	Consistency
Water Quality		
Policy 1. Bay water pollution should be prevented to the greatest extent feasible. The Bay's tidal marshes, tidal flats, and water surface area and volume should be conserved and, whenever possible, restored and increased to protect and improve water quality. Fresh water inflow into the Bay should be maintained at a level adequate to protect Bay resources and beneficial uses.	**VMT:** As described in Section 3.8, Hydrology and Water Quality, construction of the VMT facilities could result in significant impacts to water quality. However, these impacts would be subject to appropriate mitigation measures as described in Section 3.3 and Section 3.8, which would ensure impacts remain less than significant. Once operational, VMT would be subject to the Stormwater Control Plan, which has been designed to reduce stormwater runoff and minimize Bay water pollution; therefore, impacts would be less than significant. **Orcem:** As described in Section 3.8, Hydrology and Water Quality, the Orcem project component would not result in any significant impacts to water quality during construction with implementation of a construction SWPPP. Once operational, Orcem would be subject to the Stormwater Control Plan, which has been designed to reduce stormwater runoff and minimize Bay water pollution; therefore, impacts would be less than significant.	Consistent
Policy 3. New projects should be sited, designed, constructed and maintained to prevent or, if prevention is infeasible, to minimize the discharge of pollutants into the Bay by: (a) controlling pollutant sources at the project site; (b) using construction materials that contain non-polluting materials; and (c) applying appropriate, accepted and effective best management practices, especially where water dispersion is poor and near shellfish beds and other significant biotic resources.	**VMT and Orcem:** Refer to response to Water Quality Policy 1, above.	Consistent
Policy 6. To protect the Bay and its tributaries from the water quality impacts of nonpoint source pollution, new development should be sited and designed consistent with standards in municipal stormwater permits and state and regional stormwater management guidelines, where applicable, and with the protection of Bay resources. To offset impacts from increased impervious areas and land disturbances, vegetated swales, permeable pavement materials, preservation of existing trees and vegetation, planting native vegetation and other appropriate measures should be evaluated and implemented where appropriate.	**VMT and Orcem:** Refer to response to Water Quality Policy 1, above.	Consistent

Table 3.9-2
Consistency of the Proposed Project with Relevant Goals, Objectives, and Policies

Goals, Objectives, and Policies	Analysis	Consistency
Policy 7. Whenever practicable, native vegetation buffer areas should be provided as part of a project to control pollutants from entering the Bay, and vegetation should be substituted for rock riprap, concrete, or other hard surface shoreline and bank erosion control methods where appropriate and practicable.	**VMT:** As described in Section 3.8, Hydrology and Water Quality, the VMT project component provides for the construction of vegetated swales, a storm drain system, and bio-basin for detention and filtration (see Figure 3.8-2) with the capacity to handle up to 100-year storm volumes. **Orcem:** As described in Section 3.8, Hydrology and Water Quality, the Orcem project component would utilize a drainage system with stormwater catchment and treatment tanks in-lieu of vegetated swales within the limited available space on-site.	Consistent
Water Surface Area and Volume		
Policy 1. The surface area of the Bay and the total volume of water should be kept as large as possible in order to maximize active oxygen interchange, vigorous circulation, and effective tidal action. Filling and diking that reduce surface area and water volume should therefore be allowed only for purposes providing substantial public benefits and only if there is no reasonable alternative.	**VMT:** A small area of fill and a new rock dike would be required in order to achieve necessary design parameters for marine logistics on the VMT Site. The proposed solid fill areas, approximately 106,040 square feet in total for Phases 1 and 2, would be used as back area for the loading and unloading of cargo and as a lay-down area for marine construction materials. The proposed fill would allow for the reuse of an existing wharf area for modern cargo loading and unloading, which would provide a substantial public benefit by increasing the capacity for cargo shipping in the City of Vallejo. **Orcem:** The Orcem project component would not involve any filling or diking of the Bay.	Consistent
Policy 2. Water circulation in the Bay should be maintained, and improved as much as possible. Any proposed fills, dikes, or piers should be thoroughly evaluated to determine their effects upon water circulation and then modified as necessary to improve circulation or at least to minimize any harmful effects.	**VMT:** As described above, the VMT project component would require a small amount of fill and would involve the construction of a new wharf structure and rock dike in the Bay. The proposed Phase 1 wharf structure would replace an existing deteriorated wharf that was previously used by General Mills. The impacts of the proposed fill, Phase 2 rock dike, and Phase 1 wharf structure are analyzed throughout this Environmental Impact Report (EIR), and mitigation is provided to reduce or avoid impacts to the extent practicable. **Orcem:** The Orcem project component would not involve any filling or diking of the Bay.	Consistent

Table 3.9-2
Consistency of the Proposed Project with Relevant Goals, Objectives, and Policies

Goals, Objectives, and Policies	Analysis	Consistency
Tidal Marshes and Tidal Flats		
Policy 1. Tidal marshes and tidal flats should be conserved to the fullest possible extent. Filling, diking, and dredging projects that would substantially harm tidal marshes or tidal flats should be allowed only for purposes that provide substantial public benefits and only if there is no feasible alternative.	**VMT:** As described above, a small area of fill and a rock dike would be required in order to achieve necessary design parameters for marine logistics on the VMT Site. The proposed fill would allow for the reuse of an existing wharf area and the rock dike would expand the existing area for modern cargo loading and unloading, which would provide a substantial public benefit by increasing the capacity for cargo shipping in the City of Vallejo. There is no feasible alternative site on the Bay that could accommodate the proposed VMT facilities. **Orcem:** The Orcem project component would not involve any filling or diking of tidal marshes or tidal flats.	Consistent
Policy 2. Any proposed filling, diking, or dredging project should be thoroughly evaluated to determine the effect of the project on tidal marshes and tidal flats, and designed to minimize, and if feasible, avoid any harmful effects.	**VMT:** As described previously, the VMT project component would require a small amount filling, diking, and dredging. The impacts of the proposed fill, diking, and dredging are analyzed throughout this EIR, and mitigation is provided to reduce or avoid impacts to the extent practicable. **Orcem:** The Orcem project component would not involve any filling or diking of tidal marshes or tidal flats.	Consistent
Policy 3. Projects should be sited and designed to avoid, or if avoidance is infeasible, minimize adverse impacts on any transition zone present between tidal and upland habitats. Where a transition zone does not exist and it is feasible and ecologically appropriate, shoreline projects should be designed to provide a transition zone between tidal and upland habitats.	**VMT:** The VMT project component would involve development within the transition zone between tidal and upland habitats; however, the VMT project component would minimize adverse impacts on the transition zone by redeveloping a site that has previously been disturbed and developed. In addition, impacts to the transition zone would be avoided and minimized to the maximum extent feasible. **Orcem:** The Orcem project component would not involve any impacts on a transition zone between tidal and upland habitats.	Consistent
Subtidal Areas		
Policy 1. Any proposed filling or dredging project in a subtidal area should be thoroughly evaluated to determine the local and Bay-wide effects of the project on: (a) the possible introduction or spread of invasive species; (b) tidal hydrology and	**VMT:** The VMT project component would involve the removal of a deteriorated timber wharf and construction of a modern deep-water terminal and rock dike, which would require filling and dredging. As described in	Consistent

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Consistency of the Proposed Project with Relevant Goals, Objectives, and Policies

Goals, Objectives, and Policies	Analysis	Consistency
sediment movement; (c) fish, other aquatic organisms and wildlife; (d) aquatic plants; and (e) the Bay's bathymetry. Projects in subtidal areas should be designed to minimize and, if feasible, avoid any harmful effects.	Section 3.3, Biological Resources, sediment deposition from dredging for the VMT project would result in the temporary degradation of approximately 12.1 acres of benthic habitat and the permanent loss of approximately 2.74 acres of subtidal soft substrate. However, impacts would remain less than significant. Ongoing dredging activities for maintenance would be required on a periodic basis an estimated average for 5 days every 4 years, and would be subject to a U.S. Army Corps of Engineers (USACE) permit. **Orcem:** The Orcem project component would not involve any filling or dredging.	
Policy 2. Subtidal areas that are scarce in the Bay or have an abundance and diversity of fish, other aquatic organisms and wildlife (e.g., eelgrass beds, sandy deep water or underwater pinnacles) should be conserved. Filling, changes in use, and dredging projects in these areas should therefore be allowed only if: (a) there is no feasible alternative; and (b) the project provides substantial public benefits.	**VMT:** The VMT project component would involve the removal of a deteriorated timber wharf and construction of a modern deep-water terminal, which would require filling and dredging. As described in Section 3.3, Biological Resources, the low intertidal and subtidal area of the Napa River identified to be affected by the wharf and dike construction, consists predominantly of a tidal mudflat that does not support any eelgrass, widgeon grass, or other submerged aquatic vegetation and provides only low quality foraging habitat for fish species. **Orcem:** The Orcem project component would not involve any filling or dredging.	Consistent
Climate Change		
Policy 2. When planning shoreline areas or designing larger shoreline projects, a risk assessment should be prepared by a qualified engineer and should be based on the estimated 100-year flood elevation that takes into account the best estimates of future sea level rise and current flood protection and planned flood protection that will be funded and constructed when needed to provide protection for the proposed project or shoreline area. A range of sea level rise projections for mid-century and end of century based on the best scientific data available should be used in the risk assessment. Inundation maps used for the risk assessment should be prepared under the direction of a qualified engineer. The risk assessment should identify all types of potential flooding, degrees of uncertainty, consequences of defense failure, and risks to existing habitat from proposed flood protection devices.	**VMT and Orcem:** As described in Section 3.6, Greenhouse Gas Emissions, of this EIR, a sea level rise (SLR) assessment was prepared for the proposed project by Moffatt & Nichol. The proposed project would be designed to be resilient to SLR as projected up to 2088 in the California Climate Action Team's State of California SLR Guidance Document.	Consistent

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Consistency of the Proposed Project with Relevant Goals, Objectives, and Policies

Goals, Objectives, and Policies	Analysis	Consistency
Policy 3. To protect public safety and ecosystem services, within areas that a risk assessment determines are vulnerable to future shoreline flooding that threatens public safety, all projects—other than repairs of existing facilities, small projects that do not increase risks to public safety, interim projects and infill projects within existing urbanized areas—should be designed to be resilient to a mid-century sea level rise projection. If it is likely the project will remain in place longer than mid-century, an adaptive management plan should be developed to address the long-term impacts that will arise based on a risk assessment using the best available science-based projection for sea level rise at the end of the century.	**VMT and Orcem:** The potential for sea level rise and associated risks has been evaluated in Section 3.6, Greenhouse Gas Emissions, of this EIR. Based on the SLR predictions in the California Climate Action Team's State of California SLR Guidance Document, the proposed project would be resilient to sea level rise as projected up to 2088.	Consistent
Safety of Fills		
Policy 2. Even if the Bay Plan indicates that a fill may be permissible, no fill or building should be constructed if hazards cannot be overcome adequately for the intended use in accordance with the criteria prescribed by the Engineering Criteria Review Board.	**VMT:** As described in Section 3.5, Geology and Soils, the VMT project component would involve fill; however, a design-level geotechnical study would be prepared and compliance with all recommendations contained in the study would ensure that hazards related to use of fill would be minimized. **Orcem:** The Orcem project component would not involve any fill of the Bay.	Consistent
Policy 3. To provide vitally needed information on the effects of earthquakes on all kinds of soils, installation of strong-motion seismographs should be required on all future major land fills. In addition, the Commission encourages installation of strong-motion seismographs in other developments on problem soils, and in other areas recommended by the U.S. Geological Survey, for purposes of data comparison and evaluation.	**VMT:** The VMT project component would involve approximately 288,507 square feet in total of Bay-Delta waters surface area fill (Phases 1 and 2), involving a total volume of 56,580 cubic yards of engineered fill; however, this is not considered a major fill. **Orcem:** The Orcem project component would not include any major fills.	Consistent
Policy 4. Adequate measures should be provided to prevent damage from sea level rise and storm activity that may occur on fill or near the shoreline over the expected life of a project. The Commission may approve fill that is needed to provide flood protection for existing projects and uses. New projects on fill or near the shoreline should either be set back from the edge of the shore so that the project will not be subject to dynamic wave energy, be built so the bottom floor level of structures will be above a 100-year flood elevation that takes future sea level rise into account for the expected life of the project, be specifically designed to tolerate periodic flooding, or	**VMT and Orcem:** The potential for sea level rise and associated risks has been evaluated in Section 3.6, Greenhouse Gas Emissions, of this EIR. The structures associated with the proposed project most vulnerable to storm activity and SLR would be the proposed Phase 1 wharf. The wharf would be constructed to accommodate a 100-year event based on SLR predictions in the California Climate Action Team's State of California SLR Guidance Document.	Consistent

Table 3.9-2
Consistency of the Proposed Project with Relevant Goals, Objectives, and Policies

Goals, Objectives, and Policies	Analysis	Consistency
employ other effective means of addressing the impacts of future sea level rise and storm activity. Rights-of-way for levees or other structures protecting inland areas from tidal flooding should be sufficiently wide on the upland side to allow for future levee widening to support additional levee height so that no fill for levee widening is placed in the Bay.		
Dredging		
Policy 1. Dredging and dredged material disposal should be conducted in an environmentally and economically sound manner. Dredgers should reduce disposal in the Bay and certain waterways over time to achieve the LTMS [Long-Term Management Strategy] goal of limiting in-Bay disposal volumes to a maximum of one million cubic yards per year. The LTMS agencies should implement a system of disposal allotments to individual dredgers to achieve this goal only if voluntary efforts are not effective in reaching the LTMS goal. In making its decision regarding disposal allocations, the Commission should confer with the LTMS agencies and consider the need for the dredging and the dredging projects, environmental impacts, regional economic impacts, efforts by the dredging community to implement and fund alternatives to in-Bay disposal, and other relevant factors. Small dredgers should be exempted from allotments, but all dredgers should comply with policies 2 through 12.	**VMT:** On the water side of the proposed VMT wharf, the channel would be dredged to a depth of -38.0 feet mean lower low water (MLLW) (approximately 89,800 cubic yards for Phase 1, and 46,500 cubic yards for Phase 2 subject to a permit from the USACE. This depth would subsequently be maintained through a USACE Section 10 Maintenance Permit. Beneficial use of dredge material would be sought on site, and any material unfit for reuse would be deposited at the Carquinez disposal site. **Orcem:** The Orcem project component would not involve any dredging.	Consistent
Policy 3. Dredged materials should, if feasible, be reused or disposed outside the Bay and certain waterways. Except when reused in an approved fill project, dredged material should not be disposed in the Bay and certain waterways unless disposal outside these areas is infeasible and the Commission finds: (a) the volume to be disposed is consistent with applicable dredger disposal allocations and disposal site limits adopted by the Commission by regulation; (b) disposal would be at a site designated by the Commission; (c) the quality of the material disposed of is consistent with the advice of the San Francisco Bay Regional Water Quality Control Board and the inter-agency Dredged Material Management Office (DMMO); and (d) the period of disposal is consistent with the advice of the California Department of Fish and Game, the U.S. Fish and Wildlife Service and the National Marine Fisheries Service.	**VMT:** As described above, the VMT project component would require dredging subject to a permit from USACE. This depth would subsequently be maintained through a USACE Section 10 Maintenance Permit. Beneficial use of dredge material would be sought on-site, and any material unfit for reuse would be deposited at the Carquinez disposal site. **Orcem:** The Orcem project component would not involve any dredging.	Consistent

Table 3.9-2
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Policy 4. If an applicant proposes to dispose dredged material in tidal areas of the Bay and certain waterways that exceeds either disposal site limits or any disposal allocation that the Commission has adopted by regulation, the applicant must demonstrate that the potential for adverse environmental impact is insignificant and that non-tidal and ocean disposal is infeasible because there are no alternative sites available or likely to be available in a reasonable period, or because the cost of disposal at alternate sites is prohibitive. In making its decision whether to authorize such in-Bay disposal, the Commission should confer with the LTMS agencies and consider the factors listed in Policy 1.	**VMT:** As described above, the VMT project component would require dredging subject to a permit from USACE. Beneficial use of dredge material would be sought on site, and any material unfit for reuse would be deposited at the Carquinez disposal site. **Orcem:** The Orcem project component would not involve any dredging.	Consistent
Policy 6. Dredged materials disposed in the Bay and certain waterways should be carefully managed to ensure that the specific location, volumes, physical nature of the material, and timing of disposal do not create navigational hazards, adversely affect Bay sedimentation, currents or natural resources, or foreclose the use of the site for projects critical to the economy of the Bay Area.	**VMT:** As described above, the VMT project component would require dredging subject to a permit from USACE. Beneficial use of dredge material would be sought on site, and any material unfit for reuse would be deposited at the Carquinez disposal site. **Orcem:** The Orcem project component would not involve any dredging.	Consistent
Policy 7. All proposed channels, berths, turning basins, and other dredging projects should be carefully designed so as not to undermine the stability of any adjacent dikes, fills or fish and wildlife habitats.	**VMT:** As described above, the VMT project component would require dredging subject to a permit from USACE. As described in Section 3.8 of this EIR, Hydrology and Water Quality, the Phase 1 wharf and Phase 2 rock dike and the new area of engineered fill would not substantially change the course of the Mare Island Strait. As described in Section 3.3, Biological Resources, with adherence to established BMPs, work windows, and mitigation measures, the proposed dredging activities would not result in a significant detrimental effect on fish or marine wildlife habitat. **Orcem:** The Orcem project component would not involve any dredging.	Consistent
Policy 9. To protect underground fresh water reservoirs (aquifers): (a) all proposals for dredging or construction work that could penetrate the mud "cover" should be reviewed by the San Francisco Bay Regional Water Quality Control Board and the State Department of Water Resources; and (b) dredging or construction work should not be permitted that might reasonably be expected to damage an underground water reservoir. Applicants for permission to dredge should provide additional data on	**VMT:** As described above, the VMT project component would require dredging subject to a permit from USACE. Approval would also be sought from the San Francisco Bay Regional Water Quality Control Board and the State Department of Water Resources. As described in Section 3.8 of this EIR, Hydrology and Water Quality dewatering during the construction period for both projects could be required. However, the	Consistent

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Consistency of the Proposed Project with Relevant Goals, Objectives, and Policies

Goals, Objectives, and Policies	Analysis	Consistency
groundwater conditions in the area of construction to the extent necessary and reasonable in relation to the proposed project.	dewatering would only result in a temporary and highly localized effect on the uppermost water-bearing zones related to near-surface excavations which are not accessed by adjacent property owners as a source of water supply. **Orcem:** The Orcem project component would not involve any dredging.	
Water-Related Industry		
Policy 1. Sites designated for both water-related industry and port uses in the Bay Plan should be reserved for those industries and port uses that require navigable, deep water for receiving materials or shipping products by water in order to gain a significant transportation cost advantage.	**VMT and Orcem:** The proposed project consists of marine terminal uses that require navigable, deep water for shipping and receiving materials and cargo. The project would ensure the continuation of such uses in a location historically used for water-related industry.	Consistent
Policy 2. Linked industries, water-using industries, and industries which gain only limited economic benefits by fronting on navigable water, should be located in adjacent upland areas. However, pipeline corridors serving such facilities may be permitted within water-related industrial priority use areas, provided pipeline construction and use does not conflict with present or future water-transportation use of the site.	**VMT:** The VMT project component consists of marine terminal uses that require navigable, deep water for shipping and receiving materials and cargo. These uses require access to navigable waters and would not be feasible in upland areas. **Orcem:** The proposed Orcem facilities would be developed in the upland area adjacent to the proposed marine terminal. The Orcem component is dependent on proximity to the water and use of the VMT Phase 1 Terminal for import of its primary raw material, granulated blast furnace slag (GBFS).	Consistent
Policy 4. Water-related industry and port sites should be planned and managed so as to avoid wasteful use of the limited supply of waterfront land. The following principles should be followed to the maximum extent feasible in planning for water-related industry and port use: a. Extensive use of the shoreline for storage of raw materials, fuel, products, or waste should not be permitted on a long-term basis. If required, such storage areas should generally either be at right angles to the main direction of the shoreline or be as far inland as feasible, so other use of the shoreline may be made possible. b. Where large acreages are available, site planning should strive to provide access to the shoreline for all future plants and port facilities that might locate in the same area. (As a general rule, therefore, the longest	**VMT and Orcem:** The proposed project has been planned to take advantage of an existing industrial site and marine facilities that were historically used by General Mills. a. The shoreline areas of the project site would be used for a modern deep-water terminal, including a wharf, rock dike, and laydown area. Storage areas and other structures would be located in the upland areas, in the general location of the existing structures on the site. b. The VMT project component has been designed to maximize the ability of the marine terminal to expand in the future, while also minimizing environmental impacts. c. The project does not involve any waste treatment ponds.	Consistent

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Goals, Objectives, and Policies	Analysis	Consistency
dimension of plant sites should be at right angles to the shoreline.) Marine terminals should also be shared as much as possible among industries and port uses. c. Waste treatment ponds for water-related industry and port uses should occupy as little land as possible, be above the highest recorded level of tidal action, and be as far removed from the shoreline as possible. d. Any new highways, railroads, or rapid transit lines in existing or future water-related industrial and port areas should be located sufficiently far away from the waterfront so as not to interfere with industrial use of the waterfront. New access roads to waterfront industrial and port areas should be approximately at right angles to the shoreline, topography permitting.	d. The project does not propose any new highways, railroads, or rapid transit lines; however, it would upgrade the existing roads and railroads within and adjacent to the site to enable the use of these existing facilities.	
Policy 5. Water-related industry and port uses should be planned so as to make the sites attractive (as well as economically important) uses of the shoreline. The following criteria should be employed to the maximum extent possible: a. Air and water pollution should be minimized through strict compliance with all relevant laws, policies and standards. Mitigation, consistent with the Commission's policy concerning mitigation, should be provided for all unavoidable adverse environmental impacts. b. When bayfront hills are used for water-related industries, terracing should generally be required and leveling of the hills should not be permitted. c. Important Bay overlook points, and historic areas and structures that may be located in water-related industrial and port areas, should be preserved and incorporated into the site design, if at all feasible. In addition, shoreline not actually used for shipping facilities should be used for some type of public access or recreation, to the maximum extent feasible. Public areas need not be directly accessible by private automobiles with attendant parking lots and driveways; access may be provided by hiking paths or by forms of public transit such as elephant trains or aerial tramways. d. d. Regulations, tax arrangements, or other devices should be drawn in a manner that encourages industries and port uses to meet the foregoing objectives.	**VMT and Orcem:** The proposed project has been planned to take advantage of an existing industrial site and marine facilities that were historically used by General Mills. a. Air and water pollution associated with the proposed project are discussed in Sections 3.2 and 3.7 of this EIR, respectively. As described in these sections, the proposed project has been designed to minimize air and water pollution in compliance with applicable laws and regulations. b. The site does not include any bayfront hills that would be impacted by the project. c. As described in Section 3.4, Cultural Resources, the project site does include historic buildings and structures, some of which would be demolished, and others which would be reused as feasible. In addition, public access to the site would be restricted due to Department of Homeland Security regulations for the security of active marine terminals. Public access to the shoreline would continue to be provided to the north and south of the project site. In addition, VMT would install a new self-propelled personal watercraft launch just north of the access ramp to K Dock at the south end of the City of Vallejo Municipal Marina. This public access improvement would be completed by VMT in lieu of providing direct public access to	Consistent

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Goals, Objectives, and Policies	Analysis	Consistency
	the waterfront within the project site. d. Not applicable.	
	Ports	
Policy 1. Port planning and development should be governed by the policies of the Seaport Plan and other applicable policies of the Bay Plan. The Seaport Plan provides for: a. Expansion and/or redevelopment of port facilities at Benicia, Oakland, Redwood City, Richmond, and San Francisco, and development of new port facilities at Selby; b. Further deepening of ship channels needed to accommodate expected growth in ship size and improved terminal productivity; c. The maintenance of up-to-date cargo forecasts and existing cargo handling capability estimates to guide the permitting of port terminals; and d. Development of port facilities with the least potential adverse environmental impacts while still providing for reasonable terminal development.	**VMT:** The VMT project component would redevelop the existing marine terminal facilities on the former General Mills site in order to provide additional capacity for importing and exporting cargo and other materials. The VMT project component would minimize adverse environmental impacts by reusing an existing site and performing minimal dredging and filling needed to achieve necessary design parameters for marine logistics. **Orcem:** The Orcem project component does not propose to expand or redevelop port facilities; it would utilize the VMT Phase 1 Terminal by providing an enclosed conveyor to transport imported raw materials from the terminal to the Orcem Site.	Consistent
Policy 2. Some filling and dredging will be required to provide for necessary port expansion, but any permitted fill or dredging should be in accord with the Seaport Plan.	**VMT:** As described above, the VMT project component would require some filling and dredging in order to achieve necessary design parameters for marine logistics. The proposed filling and dredging would be in accordance with the Seaport Plan. **Orcem:** The Orcem project component would not involve any filling or dredging of Bay-Delta waters.	Consistent
Policy 3. Port priority use areas should be protected for marine terminals and directly-related ancillary activities such as container freight stations, transit sheds and other temporary storage, ship repairing, support transportation uses including trucking and railroad yards, freight forwarders, government offices related to the port activity, chandlers, and marine services. Other uses, especially public access and public and commercial recreational development, should also be permissible uses provided they do not significantly impair the efficient utilization of the port area.	**VMT and Orcem:** The proposed project is not located in a Port priority use area; however, it would re-establish marine-related industrial uses on the former General Mills site. Due to the nature of the planned operations on the site, including shipping, the site would be a Department of Homeland Security-controlled site, and no public access would be permitted. In addition, VMT would install a new self-propelled personal watercraft launch just north of the access ramp to K Dock at the south end of the City of Vallejo Municipal Marina. This public access improvement would be completed by VMT in lieu of providing direct public access to the waterfront within the project site.	Consistent

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Goals, Objectives, and Policies	Analysis	Consistency
Public Access		
Policy 1. A proposed fill project should increase public access to the Bay to the maximum extent feasible, in accordance with the policies for Public Access to the Bay.	**VMT:** As described above, a small area of fill would be required in both phases of the VMT project component in order to achieve necessary design parameters for marine logistics. Due to the nature of the planned operations on the site, including shipping, the site would be a Department of Homeland Security-controlled site, and no public access would be permitted. The project site has been historically used for similar industrial uses and has been closed to the public. Implementation of the proposed project would therefore not change existing public access to the site. Public access to the waterfront in this area would continue to be provided adjacent to the project site along Derr Avenue to the north and Sandy Beach Road to the south. In addition, VMT would install a new self-propelled personal watercraft launch just north of the access ramp to K Dock at the south end of the City of Vallejo Municipal Marina. This public access improvement would be completed by VMT in lieu of providing direct public access to the waterfront within the project site. **Orcem:** The Orcem project component would not involve any Bay-Delta waters fill.	Consistent
Policy 2. In addition to the public access to the Bay provided by waterfront parks, beaches, marinas, and fishing piers, maximum feasible access to and along the waterfront and on any permitted fills should be provided in and through every new development in the Bay or on the shoreline, whether it be for housing, industry, port, airport, public facility, wildlife area, or other use, except in cases where public access would be clearly inconsistent with the project because of public safety considerations or significant use conflicts, including unavoidable, significant adverse effects on Bay natural resources. In these cases, in lieu access at another location preferably near the project should be provided.	**VMT and Orcem:** As described above, the project site would be a Department of Homeland Security-controlled site, and no public access would be permitted. Public access to the waterfront in this area would continue to be provided adjacent to the project site along Derr Avenue to the north and Sandy Beach Road to the south. In addition, in-lieu access would be provided as described in response to Public Access Goal 1 above.	Consistent
Policy 9. Access to and along the waterfront should be provided by walkways, trails, or other appropriate means and connect to the nearest public thoroughfare where convenient parking or public transportation may be available. Diverse and interesting public access experiences should be provided which would encourage users to remain in the designated access areas to avoid or minimize potential adverse effects on wildlife and their habitat.	**VMT and Orcem:** As described above, the project site would be a Department of Homeland Security-controlled site, and no public access would be permitted. Public access to the waterfront in this area would continue to be provided adjacent to the project site along Derr Avenue to the north and Sandy Beach Road to the south. In addition, in-lieu access would be provided, as described in response to Public Access Goal 1 above.	Consistent

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Goals, Objectives, and Policies	Analysis	Consistency
Appearance, Design and Scenic Views		
Policy 1. To enhance the visual quality of development around the Bay and to take maximum advantage of the attractive setting it provides, the shores of the Bay should be developed in accordance with the Public Access Design Guidelines.	**VMT and Orcem:** The Public Access Design Guidelines have been considered in the design of the proposed project; however, as described previously, the project site would be a Department of Homeland Security-controlled site, and no public access would be permitted. Public access to the waterfront in this area would continue to be provided adjacent to the project site along Derr Avenue to the north and Sandy Beach Road to the south.	Consistent
Policy 2. All bayfront development should be designed to enhance the pleasure of the user or viewer of the Bay. Maximum efforts should be made to provide, enhance, or preserve views of the Bay and shoreline, especially from public areas, from the Bay itself, and from the opposite shore. To this end, planning of waterfront development should include participation by professionals who are knowledgeable of the Commission's concerns, such as landscape architects, urban designers, or architects, working in conjunction with engineers and professionals in other fields.	**VMT and Orcem:** The proposed organization of land uses and grouping of structures would result in a well-composed urban design. The project designs take into consideration the existing characteristics of the site and surrounding area, as well as the functional requirements of the project components.	Consistent
Policy 3. In some areas, a small amount of fill may be allowed if the fill is necessary—and is the minimum absolutely required—to develop the project in accordance with the Commission's design recommendations.	**VMT:** As described above, a small area of fill would be required in both phases of the VMT project component in order to achieve necessary design parameters for marine logistics. **Orcem:** The Orcem project component would not involve any Bay-Delta waters fill.	Consistent
Policy 4. Structures and facilities that do not take advantage of or visually complement the Bay should be located and designed so as not to impact visually on the Bay and shoreline. In particular, parking areas should be located away from the shoreline. However, some small parking areas for fishing access and Bay viewing may be allowed in exposed locations.	**VMT and Orcem:** The proposed project would reuse existing buildings on the site to the maximum extent practicable and would maintain the site as an industrial facility as it has been used historically. As described in Section 3.1, Aesthetics, the proposed structures and facilities would replace existing buildings of similar scale and style and replace some badly deteriorating structures with modern facilities. The proposed structures and facilities would be located generally in the same location as the existing buildings on the site and would not substantially alter the views of the Bay. Proposed parking would be located along the eastern hillside, away from the shoreline.	Consistent

Table 3.9-2
Consistency of the Proposed Project with Relevant Goals, Objectives, and Policies

Goals, Objectives, and Policies	Analysis	Consistency
Policy 5. To enhance the maritime atmosphere of the Bay Area, ports should be designed, whenever feasible, to permit public access and viewing of port activities by means of (a)‑view points (e.g., piers, platforms, or towers), restaurants, etc., that would not interfere with port operations, and (b)‑openings between buildings and other site designs that permit views from nearby roads.	**VMT and Orcem:** As described above, the project site would be a Department of Homeland Security-controlled site, and no public access would be permitted. Public access to the waterfront in this area would continue to be provided adjacent to the project site along Derr Avenue to the north and Sandy Beach Road to the south. In addition, in-lieu access would be provided, as described in response to Public Access Goal 1 above.	Consistent
Policy 14. Views of the Bay from vista points and from roads should be maintained by appropriate arrangements and heights of all developments and landscaping between the view areas and the water. In this regard, particular attention should be given to all waterfront locations, areas below vista points, and areas along roads that provide good views of the Bay for travelers, particularly areas below roads coming over ridges and providing a "first view" of the Bay (shown in Bay Plan Map No. 8, Natural Resources of the Bay).	**VMT and Orcem:** As described in Section 3.1, Aesthetics, the proposed project would result in minor changes to views from public viewpoints surrounding the site. The proposed construction would primarily replace existing buildings of similar scale and style and would include landscaping to help screen the facilities from surrounding areas. The proposed development would not significantly detract from any scenic vistas.	Consistent
Fills in Accord with the Bay Plan		
Policy 1. Fills in accord with the Bay Plan. A proposed project should be approved if the filling is the minimum necessary to achieve its purpose, and if it meets one of the following three conditions: a. The filling is in accord with the Bay Plan policies as to the Bay-related purposes for which filling may be needed (i.e., ports, water-related industry, and water-related recreation) and is shown on the Bay Plan maps as likely to be needed; or b. The filling is in accord with Bay Plan policies as to purposes for which some fill may be needed if there is no other alternative (i.e., airports, roads, and utility routes); or c. The filling is in accord with the Bay Plan policies as to minor fills for improving shoreline appearance or public access.	**VMT:** As described above, a small area of fill would be required in both phases of the VMT project component in order to achieve necessary design parameters for marine logistics. The proposed fill would allow for the reuse of an existing wharf area for modern cargo loading and unloading, which would provide a substantial public benefit by increasing the capacity for cargo shipping in the City of Vallejo. **Orcem:** The Orcem project component would not involve any Bay-Delta waters fill.	Consistent

Table 3.9-2
Consistency of the Proposed Project with Relevant Goals, Objectives, and Policies

Goals, Objectives, and Policies	Analysis	Consistency
Vallejo General Plan		
Waterfront Development Goal: To have a waterfront devoted exclusively to water oriented uses, including industrial, residential, commercial and open space uses, which permit public access.	**VMT and Orcem:** The proposed project includes water-oriented industrial uses that are reliant on water for transportation of materials. Due to the nature of the planned operations on the site, including shipping, the site would be a Department of Homeland Security-controlled site, and no public access would be permitted. The project site has been historically used for similar industrial uses and has been closed to the public. Implementation of the proposed project would therefore not change existing public access to the site. Public access to the waterfront in this area would continue to be provided adjacent to the project site along Derr Avenue to the north and Sandy Beach Road to the south. In addition, VMT would install a new self-propelled personal watercraft launch just north of the access ramp to K Dock at the south end of the City of Vallejo Municipal Marina. This public access improvement would be completed by VMT in lieu of providing direct public access to the waterfront within the project site.	Consistent
Policy 1: BCDC's Public Access Design Guidelines should be used in reviewing all development proposals. In areas hazardous to public safety or incompatible with public use, in-lieu access at another nearby location may be provided.	**VMT and Orcem:** The BCDC Public Access Design Guidelines have been considered in the design of the proposed project. However, as described previously, due to the nature of the planned operations on the site, no public access would be permitted. Public access to Mare Island Strait would continue to be provided adjacent to the project site along Derr Avenue to the north and Sandy Beach Road to the south. In addition, in-lieu access would be provided via the installation of a new self-propelled personal watercraft launch, as described above.	Consistent
Policy 3: The following public access to and along public waterways, streams and rivers is required where feasible: a. Access to the water every 1,500 feet; b. Accessway to be a minimum of 50 feet wide; c. Access along the: water to be a minimum of-200 feet in width; a. Planned Developments and commercial and industrial areas may vary provided they are within the intent and purpose of this provision.	**VMT and Orcem:** The proposed project is located on Mare Island Strait, which is a public waterway; however, as described above, no public access would be permitted. Public access to Mare Island Strait would continue to be provided adjacent to the project site along Derr Avenue to the north and Sandy Beach Road to the south. The project site has been historically used for similar industrial uses and has been closed to the public. Implementation of the proposed project would therefore not change existing public access to the site. In addition, in-lieu access would be provided via the installation of a new self-propelled personal watercraft launch, as described above.	Consistent

Table 3.9-2
Consistency of the Proposed Project with Relevant Goals, Objectives, and Policies

Goals, Objectives, and Policies	Analysis	Consistency
Industrial Development Goal 3: To insure compatibility between industrial land uses and uses of a lesser intensity.	**VMT and Orcem:** The proposed project is located in an area that has been historically used for industrial uses and is assigned an industrial land use designation. The project site is bound by steep hillsides, Mare Island Straits, and railroad tracks, which all serve as natural buffers from the surrounding uses of lesser intensity.	Consistent
Policy 1: Where possible, natural buffers, e.g., railroad tracks, major street, or abrupt topographic changes should be used to delineate industrial areas.	**VMT and Orcem:** The proposed project is located in an area that has been historically used for industrial uses and is assigned an industrial land use designation. The project site is bound by steep hillsides, Mare Island Straits, and railroad tracks, which all serve as natural buffers from the surrounding areas.	Consistent
Industrial Development Goal 4: To maximize the potential of industrially zoned lands for the fostering of new and innovative industrial development.	**VMT and Orcem:** The proposed project would redevelop the industrially zoned project site with a viable marine terminal and manufacturing facility for ground granulated blast furnace slag (GGBFS) and other cement products. Use of the project site would be maximized by locating both the VMT and Orcem components of the project on one site.	Consistent
Policy 1: Use the Planned Development approach in those areas where industrial uses will be compatible with accessory residential and/or commercial uses.	**VMT and Orcem:** The proposed project would involve shipping and industrial operations that would not be compatible with accessory residential uses; however, VMT proposes to allow for future commercial office use of remaining existing buildings on the site, including the Administration Building. Any future uses on the site would be required to be compatible with the VMT and Orcem uses.	Consistent
Circulation and Transportation, Compatibility with Adjoining Land Uses Goal: To have a street and highway system that services all land uses with a minimum adverse impact.	**VMT and Orcem:** As described in Section 3.12, Transportation and Traffic, the project site is currently accessible via the existing street and highway network surrounding the site. The proposed project would utilize this system and would implement mitigation measures, specified in Section 4.12, to minimize adverse impacts to the street and highway system.	Consistent
Policy 3: All truck traffic and regional bus service should be restricted to peripheral major streets and north-south, east-west arterial and collector streets having the least number of residences and schools. Only small trucks servicing the neighborhood centers should be allowed on other streets. Where possible, unloading facilities should be provided off alleys rather than streets.	**VMT and Orcem:** As described in Section 3.12, Transportation and Traffic, it is expected that trucks accessing the site would use primarily the Curtola Parkway–Lemon Street route for trips to/from I-780 and I-80 East, and the Sonoma Boulevard route for trips to/from I-80 West. Loading and unloading of the trucks would occur on the project site.	Consistent

Table 3.9-2

Consistency of the Proposed Project with Relevant Goals, Objectives, and Policies

Goals, Objectives, and Policies	Analysis	Consistency
Public Facilities and Other Services, Other Services Goal: To provide an efficient and financially sound system of urban services to protect the health, safety and general welfare of Vallejo area residents.	**VMT and Orcem:** As described in Section 3.11, Public Services and Recreation, the proposed project would be served by the existing urban services provided by the City of Vallejo.	Consistent
Policy 5: Prior to annexation to the City, a Specific Area Plan and Environmental Impact Report should be conducted. A cost/revenue impact study should be undertaken to determine the cost of providing public services.	**VMT and Orcem:** The proposed project includes annexation of the 5.25-acre portion of the project site that is currently located outside the City of Vallejo, but within the City's Sphere of Influence. The annexation is considered throughout this EIR.	Consistent
*Air Quality Goal 1:*To improve Vallejo's air quality.	**VMT and Orcem:** As described in Section 3.2, Air Quality, the proposed project would result in significant air quality impacts, some of which would remain significant an unavoidable after mitigation. However, feasible mitigation measures would be implemented to reduce air quality impacts to the maximum extent practicable.	Consistent
Policy 2: Balance jobs and housing in future development to provide Vallejo residents the opportunity to work within Vallejo, and reduce long distance commuting both to and from Vallejo. Jobs and housing should be balanced both in numbers and in salary range/housing cost.	**VMT and Orcem:** As described in Section 5.4, Growth Inducement, the proposed project is expected to generate temporary construction job, as well as full time jobs during operation. These jobs could potentially be filled by local Vallejo residents who currently commute to manufacturing and transportation and warehousing jobs outside of Vallejo. Although the project does not propose any new housing, the increase in local jobs would help reduce the number of residents commuting outside the City for similar jobs.	Consistent
Air Quality Goal 2: To reduce the air quality impact associated with future development in Vallejo.	**VMT and Orcem:** As described in Section 3.2, Air Quality, the proposed project would result in significant air quality impacts, some of which would remain significant an unavoidable after mitigation. However, feasible mitigation measures would be implemented to reduce air quality impacts to the maximum extent practicable.	Consistent
Policy 3: Require air quality mitigation for new development not amenable to TSM methods. Retail commercial and residential development, in particular, do not lend themselves to trip reduction through TSM. As part of the environmental review process these types of uses should be required to provide air quality mitigation by providing funding for off-site improvements to improve air quality. Examples of such improvements are pedestrian/bicycle amenities, transit support, transit amenities such as bus shelters, or additional park-and-ride lots.	**VMT and Orcem:** Once operational, the VMT component of the project would employee up to 40 individuals, and the Orcem component of the project would employ up to 40 individuals. The City's Transportation Systems Management (TSM) Ordinance (Municipal Code Chapter 8.70) requires TSM measures to be implemented for "Major Employers" (employers who employ 100 or more employees). Since VMT and Orcem would not employ 100 or more employees, they would be considered "Minor Employers". The VMT and Orcem project components would be	Consistent

Table 3.9-2

Consistency of the Proposed Project with Relevant Goals, Objectives, and Policies

Goals, Objectives, and Policies	Analysis	Consistency
	required to comply with the requirements for minor employers as specified in Section 8.70.050 of the City's Municipal Code.	
Policy 4: Use project siting to reduce air pollution exposure of sensitive receptors. Locate air pollution sources away from residential areas and other sensitive receptors. Include buffer zones within residential and sensitive receptor site plans to separate these uses from freeways, arterials, point sources and potential sources of odors.	**VMT and Orcem:** The proposed project is a site dependent use and is located on the site of a previous marine terminal. Siting for the proposed project is constrained by physical site suitability characteristics and access to transportation. Site layout would be planned to minimize air pollution exposure to the maximum extent feasible.	Consistent
Fish and Wildlife Resources Goal: To protect valuable fish and wildlife habitats.	**VMT:** As described in Section 3.3, Biological Resources, the proposed wharf and dike improvements would affect marine benthic and intertidal hard-substrate habitat, however all impacts would be either less than significant or would be mitigated to a less-than-significant level. **Orcem:** The Orcem Plant would redevelop an existing industrial facility and would comply with all mitigation measures identified in Section 3.3, Biological resources to reduce impacts to wildlife habitat to below a level of significance.	Consistent
Policy 5: Recognize areas valuable for marine life productions, particularly the Napa Marshes and Carquinez Strait, and work with the California Department of Fish and Game and Bay Conservation and Development Commission in insuring the protection of these areas from incompatible uses.	**VMT:** The VMT project component would permanently impact approximately 2.74 acres of subtidal soft substrate habitat considered to be of low quality for fish foraging, and create approximately 600 linear feet of new intertidal hard substrate supportive of sessile marine fauna. Impacts would be less than significant. **Orcem:** The Orcem project component would not result in development in or use of marine or estuarine habitat.	Consistent
Noise Goal: To provide for a more pleasing acoustic environment for the city by controlling noise levels in a manner that is acceptable to the residents, reasonable for commercial and industrial land uses, and practical to enforce.	**VMT and Orcem:** As described in Section 3.10, Noise, the proposed project would result in significant noise impacts after mitigation since the City cannot guarantee that the California Northern Railroad will implement the measures needed to reduce noise associated with the proposed rail operations. The noise levels generated by proposed rail operations would be reasonable for industrial land uses and be reduced to the maximum extent practicable by the applicants and the applicants would be committed to working with the railroad to reduce noise levels as feasible.	Consistent

Table 3.9-2
Consistency of the Proposed Project with Relevant Goals, Objectives, and Policies

Goals, Objectives, and Policies	Analysis	Consistency
Policy 2: Roadways should be kept in good repair and new surface material should be evaluated in terms of noise generation.	**VMT and Orcem:** As described in Section 3.12, Transportation and Traffic, implementation of MM-3.12-1 would ensure that any damage to streets caused by construction equipment would be repaired by the project applicant. In addition, MM-3.12-4a and MM-3.12-5 would require improvements to Lemon Street to ensure the roadway is maintained during project operations. As described in Section 3.10, Noise, implementation of MM-3.10-3a would ensure that roadway noise from construction vehicles would remain less than significant.	Consistent
Floodplain Hazards Goal: To protect life, property, and public well being from seismic, floodplain, and other environmental hazards and to reduce or avoid adverse economic, social, and physical impacts caused by existing environmental conditions.	**VMT and Orcem:** As descibred in Section 3.5, Geology and Soils, and Section 3.8, Hydrology and Water Quality, implementation of required mitigation measures would ensure that the proposed project would not result in any significant impacts related to seismic, floodplain, or other environmental hazards.	Consistent
Policy 3: Evaluate all new developments to determine how peak runoff can be delayed using such measures as detention or retention basins, permanent greenbelt areas, temporary underground storage, permeable paving and roof top ponding.	**VMT and Orcem:** As described in Section 3.8, Hydrology and Water Quality, both VMT and Orcem would be subject to their respective Stormwater Control Plans, which have been designed to reduce stormwater runoff and minimize Bay water pollution.	Consistent

General Plan and Zoning Designations

The portion of the project site within the City limits is designated “Employment” and is zoned “Intensive Use.” The proposed use of the site by VMT and Orcem is consistent with the City’s existing General Plan and zoning designations for the majority of the site. Both the VMT and Orcem project components are classified as “General Industrial Uses,” which are permitted in the “Intensive Use” zoning district.

The proposed Orcem Plant would adjoin residential land uses to the east and southeast. However, all equipment and operational areas on the Orcem Site would be located more than 300 feet from the nearest residential zoning district boundary. Therefore, the Orcem component of the project would be allowed to operate on a 24-hour basis without application of the provisions of Chapter 16.57 – Limitations of Permitted Uses of the Zoning Code. Section 16.57.030(A)(1) states that all late night business operations (considered as businesses that operate between the hours of 12:00 midnight and 6:00 a.m.) that are within 300 feet of a residential use or zoning district shall require a Major Use Permit. The provisions of Section 16.57.030(A)(1) would be applicable to small portions of the VMT Site located south of the Orcem Plant where a maintenance shed is proposed, and east of the entry road where the Manager’s House is located.

The 5.25-acre portion of the project site outside the City limits is designated “Open Space-Community Park” in the City’s General Plan, but is not assigned a City zoning designation since it is currently in the jurisdiction of Solano County. The 5.25 acres are currently vacant, are within the existing fenced boundary of the project site, and have historically been a part of the former General Mills site. VMT would construct a small maintenance shed on this portion of the project site. The Solano County land use designation for this portion of the site is “Park and Recreation,” and the zoning designations are RTC-6 (Residential Traditional Community 6,000 square feet) and CR (Commercial Recreation). Since the proposed project includes annexation of this portion of the site, once the annexation is approved the project would be subject to the standards prescribed by the City’s General Plan, Municipal Code, and other City regulations. The applicants propose to change the land use designation of the 5.25-acre portion of the site from “Open Space – Community Park” to “Employment” consistent with the remainder of the site. The steep terrain associated with most of the 5.25-acre portion of the site does not provide a setting conducive for a recreational park, and the proposed designation would be more appropriate given the historical use of this area and the industrial nature of the proposed uses. In addition, this portion of the site would be pre-zoned “Intensive Use” consistent with the remainder of the site. With approval of the proposed annexation, General Plan amendment, and pre-zoning, the proposed project would be consistent with the existing General Plan and zoning designations of the entire project site.

For the reasons described above, the proposed project would not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project. Therefore, impacts would be **less than significant**.

Off-Site Improvements

The proposed project includes two off-site improvements that would take place at the City of Vallejo Municipal Marina located approximately 2 miles north of the project site: public access improvements and removal of existing deteriorated docks. The public access improvements would involve installation of a new self-propelled personal watercraft launch ramp just north of the access ramp to K Dock at the south end of the marina. The proposed launch would consist of a pre-cast articulated concrete mat, approximately 10 feet wide by 60 feet long over a geotextile fabric. Installation of the launch ramp would occur within the existing marina. The project would also involve the removal of existing deteriorated dock improvements within the water area at the north end of the marina. Approximately eighty (80) 14-inch-diameter creosote timber piles and deteriorated dock facilities would be removed from this portion of the Marina.

The proposed personal watercraft launch ramp would be consistent with the Vallejo General Plan's Waterfront Development Goal: "To have a waterfront devoted exclusively to water oriented uses, including industrial, residential, commercial and open space uses, that permit public access." And Waterfront Development Policy 1: "BCDC's Public Access Design Guidelines should be used in reviewing all development proposals. In areas hazardous to public safety or incompatible with public use, in-lieu access at another nearby location may be provided." The proposed improvement would also be consistent with existing plans outlined in the Marina Master Plan and designed and constructed according to the Vallejo Public Works design and engineering standards. The piling removal and public access ramp installation would not conflict with any land use plans, policies, or regulations intended to avoid or mitigate an environmental effect. Impacts would therefore be **less than significant.**

3.9.5 Mitigation Measures

No mitigation would be required.

3.9.6 Level of Significance After Mitigation

All impacts would be below a level of significance; therefore, mitigation is not provided.

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3.10 NOISE

This section analyzes the potential impacts of the Vallejo Marine Terminal (VMT) and Orcem project (proposed project) with respect to noise and recommends mitigation measures where necessary to reduce or avoid significant impacts. The primary information sources used to support this analysis include technical noise impact assessment reports conducted for the proposed project by an independent acoustic consultant. These include:

- **Appendix K-1**: AWN Consulting. 2014. *Environmental Noise Impact Assessment of the Proposed VMT Development, Vallejo, California*. March 2014.
- **Appendix K-2**: AWN Consulting. 2014. *Environmental Noise Impact Assessment of the Proposed Orcem Development, Vallejo, California*. March 2014.
- **Appendix K-3**: AWN Consulting. 2014. *Cumulative Environmental Noise Impact Assessment of the Proposed Orcem and VMT Developments, Vallejo, California*. March 2014.

AWN Consulting evaluated construction-related noise emissions, both from on-site construction equipment and activities and off-site transportation of materials and construction personnel, for VMT and Orcem, separately and combined. AWN Consulting also assessed long-term operational noise from each facility and from both combined operations. Additional information sources used in this section include the City of Vallejo General Plan – Noise Element (City of Vallejo 2012) and the Vallejo Noise Ordinance (Vallejo Code of Ordinances, Sections 7.84 and 16.72; City of Vallejo 2014). All figures referenced in this section are provided at the end of the section.

Noise Background and Terminology

Fundamentals of Environmental Noise

Vibrations, traveling as waves through air from a source, exert a force perceived by the human ear as sound. Sound pressure level (referred to as sound level) is measured on a logarithmic scale in decibels (dB) that represent the fluctuation of air pressure above and below atmospheric pressure. Frequency, or pitch, is a physical characteristic of sound and is expressed in units of cycles per second or hertz (Hz). The normal frequency range of hearing for most people extends from about 20 to 20,000 Hz. The human ear is more sensitive to middle and high frequencies, especially when the noise levels are quieter. As noise levels get louder, the human ear starts to hear the frequency spectrum more evenly. To accommodate for this phenomenon, a weighting system to evaluate how loud a noise level is to a human was developed. The frequency weighting called "A" weighting is typically used for quieter noise levels which de-emphasizes the low frequency components of the sound in a manner similar to the response of a human ear. This A-weighted sound level is called the "noise level" and is referenced in units of dBA.

Since sound is measured on a logarithmic scale, a doubling of sound energy results in a 3 dBA increase in the noise level. Changes in a community noise level of less than 3 dBA are not typically noticed by the human ear (DOT 1980). Changes from 3 to 5 dBA may be noticed by some individuals who are extremely sensitive to changes in noise. A 5 dBA increase is readily noticeable (EPA 1971). The human ear perceives a 10 dBA increase in sound level as a doubling of the sound level (i.e., 65 dBA sounds twice as loud as 55 dBA to a human ear).

An individual's noise exposure occurs over a period of time; however, noise level is a measure of noise at a given instant in time. Community noise sources vary continuously, being the product of many noise sources at various distances, all of which constitute a relatively stable background or ambient noise environment. The background, or ambient, noise level gradually changes throughout a typical day, corresponding to distant noise sources, such as traffic volume, as well as changes in atmospheric conditions.

Noise levels are generally higher during the daytime and early evening when traffic (including airplanes), commercial, and industrial activity is the greatest. However, noise sources experienced during nighttime hours when background levels are generally lower can be potentially more conspicuous and irritating to the receiver. In order to evaluate noise in a way that considers periodic fluctuations experienced throughout the day and night, a concept termed "community noise equivalent level" (CNEL) was developed, wherein noise measurements are weighted, added, and averaged over a 24-hour period to reflect magnitude, duration, frequency, and time of occurrence. A complete definition of CNEL is provided below.

Different types of measurements are used to characterize the time-varying nature of sound. These measurements include the equivalent sound level (L_{eq}), the minimum and maximum sound levels (L_{min} and L_{max}), percentile-exceeded sound levels (Lxx), the day–night sound level (L_{dn}), and the CNEL. Below are brief definitions of these measurements and other terminology used in this section.

- *Decibel* (dB) is a unitless measure of sound on a logarithmic scale which indicates the squared ratio of sound pressure amplitude to a reference sound pressure amplitude. The reference pressure is 20 micropascals.
- *A-weighted decibel* (dBA) is an overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.
- *Equivalent sound level* (L_{eq}) is the constant level that, over a given time period, transmits the same amount of acoustic energy as the actual time-varying sound. Equivalent sound levels are the basis for both the day–night average sound levels (L_{dn}) and community noise equivalent level (CNEL) scales.

- *Maximum sound level* (L_{max}) is the maximum sound level measured during the measurement period.
- *Minimum sound level* (L_{min}) is the minimum sound level measured during the measurement period.
- *Percentile-exceeded sound level* (Lxx) is the sound level exceeded x percent of a specific time period. L10 is the sound level exceeded 10% of the time.
- *Day–night average sound level* (L_{dn}) The L_{dn} is a 24-hour average A-weighted sound level with a 10 dB penalty added to the nighttime hours from 10:00 p.m. to 7:00 a.m. The 10 dB penalty is applied to account for increased noise sensitivity during the nighttime hours.
- *Community noise equivalent level* (CNEL) The CNEL is the average equivalent A-weighted sound level during a 24-hour day. CNEL accounts for the increased noise sensitivity during the evening hours (7 p.m. to 10 p.m.) and nighttime hours (10 p.m. to 7 a.m.) by adding 5 dB to the sound levels in the evening and 10 dB to the sound levels at night. CNEL and L_{dn} are often considered equivalent descriptors.

Exterior Noise Distance Attenuation

Noise sources are classified in two forms: (1) point sources, such as stationary equipment or a group of construction vehicles and equipment working within a spatially limited area at a given time, and (2) line sources, such as a roadway with a large number of pass-by sources (motor vehicles). Sound generated by a point source typically diminishes (attenuates) at a rate of 6.0 dBA for each doubling of distance from the source to the receptor at acoustically “hard” sites and at a rate of 7.5 dBA for each doubling of distance from source to receptor at acoustically “soft” sites. Sound generated by a line source (i.e., a roadway) typically attenuates at a rate of 3 dBA and 4.5 dBA per doubling distance, for hard and soft sites, respectively. Sound levels can also be attenuated by man-made or natural barriers. For the purpose of sound attenuation discussion, a “hard” or reflective site does not provide any excess ground-effect attenuation and is characteristic of asphalt or concrete ground surfaces, as well as very hard-packed soils. An acoustically “soft” or absorptive site is characteristic of unpaved loose soil or vegetated ground.

Fundamentals of Vibration

Vibration is an oscillatory motion that can be described in terms of displacement, velocity, or acceleration. The response of humans to vibration is very complex. However, it is generally accepted that human response to vibration is best characterized using the velocity parameter.

Heavy equipment operation, including stationary equipment that produces substantial oscillation or construction equipment that causes percussive action against the ground surface, may be perceived by building occupants as perceptible vibration. It is also common for ground-borne vibration to cause windows, pictures on walls, or items on shelves to rattle. Although the perceived vibration from such equipment operation can be intrusive to building occupants, the vibration is seldom of sufficient magnitude to cause even minor cosmetic damage to buildings.

To avoid confusion with sound decibels, the abbreviation VdB is used for vibration decibels. The vibration threshold of perception for most people is around 65 VdB. Vibration levels in the 70 to 75 VdB range are often noticeable but generally deemed acceptable, and levels in excess of 80 VdB are often considered unacceptable (FTA 2006).

3.10.1 Regulatory Setting

Federal

Noise Control Act of 1972

The U.S. Environmental Protection Agency (EPA) is authorized under the Noise Control Act of 1972 to publish guidelines on the effects of noise and establish levels of noise which are "requisite to protect the public welfare with an adequate margin of safety." Table 3.10-1 presents the recommended maximum noise exposure levels published by the EPA, categorized by effects of concern and activity or land use type. The recommended maximum exposure levels are guidelines only and do not represent strict limits.

Table 3.10-1
EPA Noise Guidelines

Effect	Level	Area
Hearing Loss	$L_{eq(24)} \leq 70$ dB	All areas.
Outdoor activity interference and annoyance	$L_{dn)} \leq 55$ dB	Outdoors in residential areas and farms and other outdoor areas where people spend widely varying amounts of time and other places in which quiet is a basis for use.
	$L_{eq(24)} \leq 55$ dB	Outdoor areas where people spend limited amounts of time, such as school yards, playgrounds, etc.
Indoor activity interference and annoyance	$L_{dn} \leq 45$ dB	Indoor residential areas.
	$L_{eq(24)} \leq 45$ dB	Other indoor areas with human activities such as schools, etc.

Federal Transit Administration and Federal Railroad Administration Standards

Although the Federal Transit Administration (FTA) standards are intended for federally funded mass transit projects, the impact assessment procedures and criteria included in the FTA *Transit Noise and Vibration Impact Assessment Manual* (May 2006) are routinely used for projects proposed by local jurisdictions. The FTA and Federal Railroad Administration have published guidelines for assessing the impacts of ground-borne vibration associated with rail projects, which have been applied by other jurisdictions to other types of projects. The FTA measure of the threshold of architectural damage for conventional sensitive structures is 0.2 inch/second perturbation projection vector (PPV).

State

California Noise Control Act of 1973

Sections 46000 through 46080 of the California Health and Safety Code, known as the California Noise Control Act of 1973, declares that excessive noise is a serious hazard to the public health and welfare and that exposure to certain levels of noise can result in physiological, psychological, and economic damage. It also identifies a continuous and increasing bombardment of noise in the urban, suburban, and rural areas. The California Noise Control Act declares that the State of California has a responsibility to protect the health and welfare of its citizens by the control, prevention, and abatement of noise. It is the policy of the state to provide an environment for all Californians free from noise that jeopardizes their health or welfare.

California Noise Insulation Standards

In 1974, the California Commission on Housing and Community Development adopted noise insulation standards for hotels, motels, dormitories, and multi-family residential buildings (24 CCR, Part 2). Title 24 established standards for interior room noise as attributable to outside noise sources. As of January 1, 2014, the State of California has adopted the 2013 California Building Code. Chapter 12 of this document provides guidance on the interior environment of buildings. The current iteration of this document no longer regulates sound transmission from exterior sources to the interior of buildings. Revisions to CCR Title 24, Part 2 are anticipated which will remove performance standards for a building façade to achieve an interior noise standard of 45dB CNEL.

Governor's Office of Planning and Research Guidelines

The Governor's Office of Planning and Research has published land use compatibility guidelines which specify acceptable noise levels for a variety of land uses. These guidelines have been adopted by the City of Vallejo (City) and are graphically illustrated in Figure 3.10-1. Further discussion is provided under the heading Land Use Compatibility Guidelines.

City of Vallejo

Land Use Compatibility Guidelines

As discussed previously, the City has adopted the land use compatibility guidelines published by the Governor's Office of Planning and Research, reproduced as Figure 3.10-1.

As illustrated in Figure 3.10-1, the normally acceptable noise level in low, medium, and high density residential areas is 60 dB L_{dn}. In areas zoned for business or commercial use the normally acceptable noise level is 70 dB L_{dn}. For industrial or manufacturing uses, the normally acceptable noise level is 70 dB $L_{dn.}$

Vallejo General Plan – Noise Element

The General Plan Noise Element Update (City of Vallejo 2012) identifies the following goal with respect to noise control within the City of Vallejo:

Goal: Maintain noise compatibility in a manner that is acceptable to residents and reasonable for commercial and industrial uses.

- *Policy 1:* Apply the noise guidelines shown in Figure 3 [reproduced as Figure 3.10-1 in this Environmental Impact Report] to land use decisions and other City actions.
  1a. The exterior noise level at primary outdoor use areas for residences should not exceed the maximum "normally acceptable" level in Figure 3 (L_{dn} of 60 dB for residences). Small decks and entry porches do not need to meet this goal. Noise levels up to 65 dB L_{dn} may be allowed at the discretion of the City where it is not economically or aesthetically reasonable to meet the more restrictive outdoor goal.

  1b. The interior noise standard shall be 45 dB L_{dn} for all residential uses, including single and multi-family housing, hotels/motels and residential healthcare facilities.
- *Policy 2*: Avoid adverse effects of noise-producing activities on existing land uses by implementing noise reduction measures, limiting hours of operation or by limiting increases in noise.
  2a. Continue to enforce the noise regulations within the Vallejo Municipal Code, including Chapter 7.84 "Regulation of Noise Disturbances" and Chapter 16.72 "Performance Standards Regulations."

  2b. Where appropriate, limit noise generating activities (for example construction and maintenance activities and loading and unloading activities) to the hours of 7:00 a.m. to 9:00 p.m.

  2c. When approving new development limit project-related noise increases to no more than 10 dB in non-residential areas and 5 dB in residential areas where the with project noise level is less than the maximum "normally acceptable" level in Table 2 [(i.e. 60 dB L_{dn} for residential areas, and up to 75 dB L_{dn} for industrial or intensive use areas)]. Limit project related increases in all areas to no more than 3 dB where the with project noise level exceeds the "normally acceptable" level in Table 2.

Vallejo Municipal Code

Noise control is provided in the Vallejo Municipal Code primarily in two sections—one dealing with prohibitions and the other establishing performance standards.

7.84.010 General prohibition – Loud unnecessary and unusual noise.

Notwithstanding any other provisions of the Vallejo Municipal Code and in addition thereto, it shall be unlawful for any person to willfully make or continue, or cause to be made or continued, any loud, unnecessary, and unusual noise which disturbs the peace or quiet of any neighborhood or which causes discomfort or annoyance to any reasonable person of normal sensitiveness residing in the area. The standard which may be considered in determining whether a violation of the provisions of this chapter exist may include, but not be limited to, the following:

A. The level of noise;
B. Whether the nature of the noise is usual or unusual;
C. Whether the origin of the noise is natural or unnatural;
D. The level and intensity of the background noise, if any;
E. The proximity of the noise to residential sleeping facilities;
F. The nature and zoning of the area within which the noise emanates;
G. The density of the inhabitation of the area within which the noise emanates;
H. The time of the day and night the noise occurs;
I. The duration of the noise;
J. Whether the noise is recurrent, intermittent, or constant; and
K. Whether the noise is produced by a commercial or noncommercial activity.

(Ord. 1377 N.C.(2d) Section 1 (part), 1997.)

7.84.020 Specific prohibitions.

In addition to and separate from the prohibition set forth in Section 7.84.010 above, the following acts, and the causing or permitting thereof, are hereby declared to be in violation of this ordinance. As used in this section, the term “noise disturbance” means any sound which: (1) endangers or injures the safety or health of humans or animals; (2) annoys or disturbs a reasonable person of normal sensitiveness; or (3) endangers or injures personal or real property. The listing of specific prohibited activities in this section is not intended to limit the city’s authority to regulate any and all loud, unnecessary and unusual noise pursuant to Section

7.84.010. Any noise not falling within the specific prohibitions set forth in this section is subject to regulation under the provisions of Section 7.84.010 above.

***

F. Loading and Unloading. It shall be unlawful to load, unload, open, close, or to do other handling of boxes, crates, containers, building materials, garbage cans, or similar objects between the hours of nine p.m. and seven a.m. in such a manner as to cause a noise disturbance across a residential real property boundary. This subsection shall not apply to the collection and disposal of garbage and recyclable materials by the city's franchises.

16.72.030 Noise performance standards.

No land use shall generate sound exceeding the maximum levels permitted in the following table when such sounds are measured in any of the zoning districts listed in this table:

Zoning District	Maximum Sound Pressure Level in Decibels
Resource Conservation, Rural Residential, and Medical Districts	55
Low, Medium, and High Density Residential Districts	60
Professional Offices, Neighborhood, Pedestrian, and Waterfront Shopping and Services Districts	70
Freeway Shopping and Service, Linear Commercial and Intensive Use Districts	75

16.72.040 Noise performance standards – Correction factors.

The following correction factors, when applicable, shall be applied to the maximum sound pressure levels given in Section 16.72.030:

Time and Operation of Type of Noise	Correction in Maximum Permitted Decibels
Emission only between 7 a.m. and 10 p.m.	Plus 5
Noise of unusual impulsive character such as hammering or drill pressing	Minus 5
Noise of unusual periodic character such as hammering or screeching	Minus 5

16.72.050 Noise performance standards – Exceptions.

The following sounds, upon compliance with state conditions, may exceed the maximum sound pressure levels given in Section 16.72.030:

C. Sounds from transportation equipment used exclusively in the movement of goods and people to and from a given premises, temporary construction or demolition work;

3.10.2 Existing Conditions

Noise Survey

An environmental noise survey was conducted in order to quantify the existing noise environment. The survey included both long-term and short-term sound level measurements at representative locations, and was conducted by Illingworth & Rodkin Inc. Full details of the baseline noise survey are included in Appendices K-1 and K-2 of this document. The following sections summarize the findings.

Measurement Locations

A series of both unattended long-term and attended short-term surveys were conducted in order to determine the existing baseline noise environment. A total of five unattended long-term monitoring positions were selected; each is described below and illustrated on Figure 3.10-2.

LT1 was selected to represent the noise environment of Sandy Beach Road residential land uses located along the waterfront.

LT2 was on a bluff overlooking the project site and adjacent to condominium units located at the northwest terminus of Seawitch Lane.

LT3 was selected to represent the noise environment of residential land uses within the Harbor Park Apartments and along Winchester Street.

LT4 was selected to represent the noise environment of noise-sensitive land uses along Lemon Street, west of Sonoma Boulevard.

LT5 quantified ambient noise levels from vehicular traffic along Sonoma Boulevard.

In addition, a total of four attended short-term monitoring positions were selected; each is described below and illustrated on Figure 3.10-2.

ST1 Lake Dalwigk Park, 70 feet from the center of Lemon Street at Sheridan Street. The measurement site represented the park and nearby residential land uses.

ST2 75 feet from the center of Sonoma Boulevard south of Solano Avenue. This location was selected to quantify ambient traffic noise levels along Sonoma Boulevard.

ST3 Center of Alden Park, Mare Island and was selected to represent the noise environment at noise-sensitive receptors on Mare Island.

ST4 Easternmost terminus of York Street and was selected to represent the noise environment at noise-sensitive receptors along the railroad corridor that leads to and from the project site.

Noise Survey Results

As described above, sound level measurement or monitoring locations were selected in order to characterize existing ambient noise levels in key areas surrounding the project site. The recorded sound levels during the survey are considered representative of average noise conditions in the immediate vicinity of the measurement location, and are used as the ambient or baseline noise condition. Results of the noise survey are presented below.

<u>Unattended Measurement Locations</u>

The results for locations LT1 to LT5 are summarized in Table 3.10-2 below.

Table 3.10-2
Summary of Results for Unattended (Long-Term) Measurement Locations

Location	Measured Noise Levels (dBA)		
	L_{day}	L_{night}	L_{dn}
LT1	54	48	55
LT2	52	45	53
LT3	49	45	52
LT4	57	48	57
LT5	60	56	63

<u>Attended Locations</u>

The results for locations ST1 to ST4 are summarized in Table 3.10-3 below.

Table 3.10-3
Summary of Results for Attended (Short-Term) Measurement Locations

Location	Start Time	Measured Noise Levels (dBA)					
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{max}
ST1	1450	59	71	62	52	47	73
	1500	57	66	61	53	46	69
ST2	1520	62	72	66	59	53	74
	1530	63	70	67	61	53	72
ST3	1100	53	65	56	44	41	71
	1110	48	60	50	43	39	63
ST4	1140	51	61	55	48	46	61
	1150	49	54	51	49	47	57

At monitoring location ST1, the primary source of noise was road traffic movement along Lemon Street. Ambient noise levels measured were in the range of 57 to 59 dBA $L_{eq\ (10\ minutes)}$.

At monitoring location ST2, the primary source of noise was road traffic along Sonoma Boulevard. Ambient noise levels measured were in the range of 62 to 63 dBA $L_{eq\ (10\ minutes)}$.

At monitoring location ST3, the primary source of noise was local road traffic. Ambient noise levels measured were in the range of 48 to 53 dBA $L_{eq\ (10\ minutes)}$.

At monitoring location ST4, the primary source of noise was local and distant road traffic. Ambient noise levels measured were in the range of 49 to 51 dBA $L_{eq\ (10\ minutes)}$.

3.10.3 Thresholds of Significance

The following criteria, included in Appendix G of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.), will be used to determine the significance of potential noise impacts. Impacts to noise would be significant if the proposed project would:

A) Expose persons to or generate noise levels in excess of standards established in the 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) Create a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project; or

D) Create a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

CEQA does not define the noise level increase that is considered substantial. However, based on guidance contained within the Vallejo General Plan Noise Element, the following significance criteria have been defined for use in this Environmental Impact Report.

Residential Areas

An increase in the day-night average noise level greater than 3 dB L_{dn} at noise-sensitive receptors would be considered significant when projected noise levels would exceed those considered “normally acceptable” for the affected land use.

An increase greater than 5 dB L_{dn} would be considered significant when projected noise levels would continue to meet those considered “normally acceptable” for the affected land use.

Non-residential Areas

An increase in the day-night average noise level greater than 3 dB L_{dn} at noise-sensitive receptors would be considered significant when projected noise levels would exceed those considered “normally acceptable” for the affected land use.

An increase greater than 10 dB L_{dn} would be considered significant when projected noise levels would continue to meet those considered “normally acceptable” for the affected land use, i.e., 75 dB L_{dn}.

Significance Criteria – Survey Result Conclusions

Based on a review of the ambient long-term and short-term noise data and the relevant noise criteria discussed in Section 3.10.1, project-generated noise increasing the existing ambient by more than 5 dBA L_{dn} would be considered significant at residential receptors represented by LT1, LT2, LT3, ST3, or ST4. These receptors include:

1. Sandy Beach Road single-family residential land uses
2. Multifamily residential units located along Seawitch Lane
3. Within the Harbor Park Apartments
4. At single-family residences along Winchester Street, on Mare Island
5. Housing along the railroad corridor

Project-generated noise increasing the existing ambient by more than 3 dBA L_{dn} above the “normally acceptable” level would be considered significant at noise-sensitive receptors represented by sites LT5, ST1, or ST2. These receptors include:

1. Lemon Street East of Sonoma Boulevard (up to 6th Street, east of which the zoning is Intensive Use)
2. Sonoma Boulevard South of Lemon Street

Project-generated noise increasing the existing ambient by more than 10 dB L_{dn} (but remaining within the “normally acceptable” level) would be considered significant at receptors represented by site LT4. This receptor includes Lemon Street West of Sonoma Boulevard, which is located within lands zoned for intensive use.

3.10.4 Impact Discussion

Noise-Sensitive Locations

For the purposes of the noise impact assessment, the closest residential properties have been included in the noise-modeling procedure in order to present the worst-case receptors in the analysis. Figure 3.10-3 indicates the location of the nearest noise-sensitive locations. Table 3.10-4 provides a brief description for each noise-sensitive location (NSL).

Table 3.10-4
Noise-Sensitive Locations

Location	Description
NSL1	Sandy Beach Road Residences
NSL2	Bay Village Apartments
NSL3	Harbor Park Apartments
NSL4	Browning Way Residences
NSL5	Colt Ct Residences
NSL6	Lemon Street Residences West of Sonoma Blvd
NSL7	Sonoma Boulevard Residences
NSL8	Mare Island Residences
NSL9	Lemon Street Residences East of Sonoma Blvd
NSL10	Residential Property near Rail Tracks on 3rd Street

A) Would the project expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

VMT Analysis

Construction Impacts

Demolition of structures, earth-moving, and construction of new construction and site improvements involves heavy construction equipment with the potential for substantial noise generation. To assess the VMT construction noise levels, the Roadway Construction Noise Model (RCNM) developed by the Federal Highway Administration (FHWA) was used. RCNM includes noise generation values for the most common heavy construction equipment, and an average usage factor for each type of equipment (% of each hour). The model also contains algorithms to combine the noise from multiple pieces of equipment as specified, and to calculate the attenuated noise level at designated receptor locations (defined by distance from the construction activity). Each phase of the construction activity has been assessed for the three closest noise sensitive locations to the development site, i.e., NSL1, NSL2, and NSL3.

Analysis (quantification) of construction noise emissions is provided in this sub-section, below. However, it should be noted the Vallejo Noise Ordinance does not specify limit values (i.e., dBA levels) for construction noise. Instead the City designates allowable hours for construction activity within the Noise Element in Policy 2b; the allowable hours are 7:00 a.m. to 9:00 p.m. (City of Vallejo 2012). Furthermore, VMC Section 16.72.050 states that in relation to the maximum permissible sound levels within the Performance Standard Regulations, sounds from temporary construction or demolition work may exceed these maximum sound pressure levels upon compliance with state conditions (i.e., equipment meeting maximum allowable sound generation levels, properly fitted with factory-installed mufflers)(City of Vallejo 2014).

The following two types of short-term noise impacts would occur during VMT Site preparation and construction:

- An increase in traffic volumes on local streets associated with the transport of workers, equipment and materials to and from the project site, and
- Heavy construction equipment operating on the project site.

The transport of workers and construction equipment and materials to the project site would incrementally increase noise levels on access roads leading to the site. Because workers and construction equipment would use existing routes, noise from slow-moving passing trucks (75 dBA L_{max} at 50 feet) would be similar to existing vehicle-generated noise. For this reason, short-term intermittent noise from trucks would be minor when averaged over a longer time period (i.e., an hour, or more). In addition, according to the City’s noise ordinance, noise from temporary transportation of goods or people to and from a given premises is exempt from the City’s noise standards. Therefore, short-term construction-related noise associated with worker and equipment transport to the proposed project site would not result in a significant impact on receptors along the access routes leading to the VMT Site.

Noise generated during demolition, excavation, grading, site preparation, and building erection on the VMT Site would result in potential noise impacts on off-site uses. Existing receptors in the vicinity, as discussed in Section 3.10.4, would be subject to short-term noise generated by construction equipment and activities on the VMT Site.

Construction would be performed in phases, each of which has its own fleet of equipment and, consequently, its own noise generation. These phases could change the intensity of the noise generated on the VMT Site and, therefore, the noise levels surrounding the site as construction progresses. However, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase. Table 3.10-5 lists construction equipment noise levels for the types of equipment likely to be used on this project. The noise levels are based on a distance of 50 feet between the equipment and a noise receptor (actual distances between on-site construction noise sources and residential receptors would be greater, as discussed below and reflected in Table 3.10-6), and are derived directly from RCNM. Appendix K-1 presents the calculation sheets for each activity and location.

According to the FHWA (RCNM), typical noise levels would range up to 95 dBA L_{max} at 50 feet during the noisiest construction phases. The site-preparation phase, which includes pile driving for the installation of piles to support pier and berth improvements, and the demolition phase, which includes impact hammers to break concrete, would generate the highest noise levels; noise emissions levels for these two pieces of equipment are identified in Table 3.10-5. Earth-moving equipment includes excavating machinery such as backhoes, bulldozers and front loaders. Compacting equipment includes compactors, scrapers, and graders. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full-power operation followed by 3 or 4 minutes at lower power settings. RCNM accounts for these cycles with a usage factor for each type of equipment, which are all well below 100%. The usage factor is applied to arrive at average noise levels which would be experienced during each phase of the VMT construction process.

Table 3.10-5
Typical Construction Noise Levels

Type of Equipment	Acoustical Usage Factor (%)	L_{max} at 50 feet (dBA)
All Other Equipment > 5 HP	50	85
Backhoe	40	80
Clam Shovel (dropping)	20	93
Compactor (ground)	20	80
Compressor (air)	40	80
Concrete Mixer Truck	40	85
Concrete Pump Truck	20	82
Concrete Saw	20	90
Crane	16	85
Dozer	40	85
Drum Mixer	50	80
Dump Truck	40	84
Excavator	40	85
Flat Bed Truck	40	84
Front End Loader	40	80
Generator	50	82
Grapple (on backhoe)	40	85
Impact Pile Driver	20	95
Jackhammer	20	85
Man Lift	20	85

Table 3.10-5
Typical Construction Noise Levels

Type of Equipment	Acoustical Usage Factor (%)	L_{max} at 50 feet (dBA)
Mounted Impact Hammer (hoe ram)	20	90
Pickup Truck	40	55
Pneumatic Tools	50	85
Pumps	50	77
Roller	20	85
Tractor	40	84
Vacuum Street Sweeper	10	80
Welder/Torch	40	73

Source: FHWA 2008.

Table 3.10-6 presents the predicted maximum noise levels at the nearest noise-sensitive locations (i.e., NSL1, NSL2, and NSL3) for a range of expected construction activities. Appendix K-1 presents the calculation sheets for each VMT construction phase activity at each sensitive receptor location.

Table 3.10-6
Predicted Maximum VMT Construction Noise Levels at Closest Sensitive Receptors

Construction Activity	Type of Equipment	Predicted dBA L_{max} Levels		
		NSL1	*NSL2*	*NSL3*
Demolition	Front End Loader	47	52	56
	Excavator (x2)	52	57	61
	Crane	49	54	57
	Mounted Impact Hammer (hoe ram)	58	64	67
	Grapple (on backhoe)	55	60	64
	Dump Truck	45	50	53
Earthwork and Excavation	Backhoe	56	60	55
	Excavator (x2)	62	67	61
	Front End Loader	57	62	56
	Roller	57	63	57
	Tractor	62	67	61
	Vacuum Street Sweeper	60	64	59
Piling	Impact Pile Driver	72	75	74
Concrete and Steel Works	Concrete Mixer Truck	57	61	56
	Concrete Pump Truck	60	64	59
	Concrete Saw	68	72	67
	Crane	59	63	58
	Drum Mixer	59	62	57
	Flat Bed Truck	53	56	51

Table 3.10-6
Predicted Maximum VMT Construction Noise Levels at Closest Sensitive Receptors

Construction Activity	Type of Equipment	Predicted dBA L_{max} Levels		
		NSL1	*NSL2*	*NSL3*
	Pneumatic Tools	64	67	62
	Welder/Torch	53	56	51

The closest noise-sensitive land uses to the VMT construction areas are NSL1, NSL2, and NSL3 which adjoin the project site. The closest residences on these properties are located between 360 and 1,427 feet from the VMT construction activity locations where the activities listed in Table 3.10-6 would occur. At these distances, maximum noise levels from construction activities at the building site could range from 47 dBA up to 75 dBA L_{max} at the property line of the nearest sensitive locations.

Since the City has not established a numeric limit for construction noise exposure, VMT construction would not exceed established standards, and impacts would be **less than significant**.

Operational Impacts

Operation of the VMT project component would be divided into the following three distinct activities or functional areas:

- Bulk terminal operations,
- Rail activity, and
- Additional vehicular traffic on the public road network.

Each of the above functions is evaluated independently for noise generation, followed by an assessment of all the functions combined.

VMT would construct a two-phased bulk aggregate import and distribution facility on the existing terminal footprint. The general transportation method would be to unload dry bulk cargo from vessels, temporarily store the cargo, and reclaim it from storage to cargo trucks and railcars for local and regional distribution. In addition, the Phase 2 terminal design would allow for reloading cargo to barges to enable VMT to engage in short sea shipping initiatives using inland and intercoastal waterways.

During initial project stages, trucks would be loaded using front-end loaders to load cargo directly in the truck trailers. Transport of materials using rail is also planned to take place from the VMT facility based upon commercial demands of potential clients. Railcars would be loaded via a surge bin to improve operational efficiency and reduce the use of wheel loaders. Wheel loaders would then be used only in the stockyard to reclaim the cargo to receiving hoppers that feed conveyors leading to the rail loading stations and to maintain the stockpiles. Truck load-out is assumed to remain mobile during both Phase 1 and Phase 2 operations.

The VMT project component would be implemented in the following two phases:

- Phase 1: Wharf would allow rail and truck transport options.
- Phase 2: Rock dike would allow rail, truck, and barge transport options.

Bulk Terminal Operations

The VMT project component would primarily be expected to receive and discharge self-unloading vessels in loads of up to approximately 40,000 metric tons at the terminal. Phase 2, which includes the construction of a dock dike, would provide facilities to accommodate export using barges. It is assumed that there would be a 5–6 day loading/unloading time per vessel. During the time that vessels are moored at the facility, 24-hour operations would be conducted for offloading or loading of cargo. Refer to Figure 3.10-4 for an illustration of the proposed VMT mobile equipment (plant) operations.

AWN Consulting used a proprietary noise prediction model by Brüel & Kjær to assess the noise generation associated with each major piece of equipment and activity including wheeled loaders, loading hoppers and trucks, vessel engines, and transloading activity. See Appendix K-1 for a detailed description of equipment, mobile plant operating assumptions (i.e., operating pattern for the wheeled loaders and moveable hoppers), and noise emissions levels for each piece of equipment. Based on the assumptions of equipment, operating patterns, and facility capacity, noise model results for VMT operations are presented below in Table 3.10-7.

Table 3.10-7
Noise Levels due to VMT Bulk Terminal Operations

Location	Phase 1						Phase 2		
	Truck Only			*Truck and Rail*			*Truck, Rail, and Barge*		
	L_{day}	L_{night}	L_{dn}	L_{day}	L_{night}	L_{dn}	L_{day}	L_{night}	L_{dn}
NSL1	38	38	45	39	39	46	41	41	47
NSL2	43	43	49	48	48	54	48	48	54
NSL3	35	35	41	41	41	47	43	43	50
NSL4	38	38	45	44	44	50	46	46	52
NSL5	33	33	39	36	36	43	41	41	47
NSL6	25	25	31	28	28	35	32	32	39
NSL7	21	21	27	25	25	32	29	29	35
NSL8	41	41	48	44	44	51	48	48	54

Table 3.10-7
Noise Levels due to VMT Bulk Terminal Operations

Location	Phase 1						Phase 2		
	Truck Only			*Truck and Rail*			*Truck, Rail, and Barge*		
	L_{day}	L_{night}	L_{dn}	L_{day}	L_{night}	L_{dn}	L_{day}	L_{night}	L_{dn}
NSL9	15	15	21	20	20	27	25	25	31
NSL10	29	29	35	32	32	39	36	36	42

Note that in Table 3.10-7, Phase 1 was modeled with the following scenarios:

- Truck only – i.e., all material leaves site by truck.
- Truck and Rail – a mixed mode operation where material leaves site by truck and rail.

Phase 2 was modeled with truck, rail, and barge. For the purposes of the noise impact assessment, the transloading of material to each transportation option (truck, rail, and barge) was assumed to take place over the course of a single 24-hour period. This assumes the following activity would occur in a single 24-hour period:

- Four truckloads per hour leaving site;
- A 100-car train being loaded over the course of 24 hours; and
- A single barge being loaded over the course of 24 hours.

As described in Chapter 2, Project Description, the maximum train size would be 77 cars; however, this analysis evaluates the impacts of 100 car trains, which is a conservative estimate. The assessment also assumes that all transportation options would be used in a single 24-hour period to present the worst case. As more transportation modes are brought on line, the volume handled by each (and therefore noise generated by the number of transloading trips for each mode) would decrease. For instance, when trucks alone are used, a maximum of 2,000 truckloads per month would leave the site; however, with the anticipated full utilization of both truck and rail, truck trips would be reduced by approximately 50% and would be further reduced with the introduction of barge operations. This figure for theoretical maximum VMT-only truck movements would again be further reduced with operation of the Orcem plant as noted in Chapter 2, Project Description, as the total maximum throughput volume for the VMT Terminal would remain limited to 160,000 metric tons per month.

Truck Trips on Roadway Network (Off-Site)

The operational phase of the VMT project component would generate additional heavy truck trips on the local road network. The actual maximum monthly VMT truck volume would be limited to 2,000 truck trips, and this figure has been used for modeling the noise impact of truck activities. Completion of the rail improvements and operation of the truck and rail mode may reduce this monthly maximum by up to 50%, or 1,000 truck trips. Again, further reductions in truck movements may result from introduction of barge movements. However, for the purposes of this assessment, it is conservatively assumed that the maximum daily number of VMT truck load trips to and from the site would be 87 for all modes and phases of operation (83 outbound loads, plus 4 inbound loads). This equates to approximately four truckloads per hour from the site, or eight trips (i.e., four trucks in/four trucks out) during each hour of a 24-hour day.

All trucks would access the site from Derr Avenue coming from Lemon Street. Southbound trucks would travel along State Route 29 (SR-29) to Interstate 80 (I-80), while northbound and eastbound trucks would travel along Lemon Street west of SR-29 before proceeding to either northbound I-80 or eastbound I-780; the split in traffic between northbound and southbound traffic is assumed to be 50/50.

Based on the conservative assumption that the maximum allowable 2,000 trucks per month would enter or leave the site and assuming an average truck speed of 20 miles per hour (mph) on all local routes, the predicted noise levels from truck trips serving the VMT Site are presented in Table 3.10-8. Please note that some receivers would not be influenced by truck trips on the local road network as they are located some distance from the road network.

Table 3.10-8
Noise Levels due to Off-Site Truck Trips Associated with VMT Operations

Location	Phases 1 and 2		
	L_{day}	L_{night}	L_{dn}
NSL1	—	—	—
NSL2	—	—	—
NSL3	31	31	37
NSL4	32	32	38
NSL5	43	43	49
NSL6	55	55	61
NSL7	54	54	61
NSL8	—	—	—
NSL9	55	55	61
NSL10	—	—	—

Rail Activity

The existing railway serving the VMT Site would be used by VMT to transport materials. The volume of material to be transported by train per month would depend on the phase of operation; however, regardless of the monthly volume throughput, a maximum equivalent of three 100-car trains could access the site per week. Please note that this assessment is based on this worst-case scenario. It is assumed that a single 100-car train movement to and from the site during any single 24-hour period is representative of the worst-case scenario for all phases and modes. It should be noted that the actual train movement frequency is anticipated to be three times per week, but in order to model the noise from the train movement, we include it in the same 24-hour period as other noise that would be occurring. In addition, as described previously, the project would utilize up to 77-car trains; therefore, the analysis of 100-car trains provides a conservative estimate.

Export of materials by rail from the VMT Site would involve the following factors:

- Arriving trains, either laden or unladen, would be parked in the proposed rail yard area to be located on the existing tracks outside the site boundary. It is expected that trains would arrive with 100 railcars.
- The railcars would then be shunted from this yard area to the rail transloading area on the VMT Site where there is capacity for 16 railcars; two train movements (or switches) per hour between the rail transloading area and the yard area are assumed (i.e., one movement in and one movement out).
- Locomotives would not idle within the yard while waiting to shunt railcars.
- A low noise emission genset switcher is proposed which has a noise emission level 10 dB below a standard freight locomotive.
- Product export would be transloaded to or from the railcars using a surge bin system that has been included in the assessment of bulk terminal operations.
- Loaded or unloaded railcars would be shunted back to the rail yard area outside the site boundary to await collection by the locomotive.

Figure 3.10-5 illustrates the locations for components or activities described above.

Rail activity noise generation was assessed using the Chicago Rail Efficiency and Transportation Efficiency (CREATE) railroad noise modeling spreadsheet which is based on the FTA procedures for the assessment of transit noise and vibration. Please refer to Appendix K-1 for the complete assumptions and inputs to the CREATE spreadsheet. Table 3.10-9 provides the results of the modeling, presented as noise levels for each component rail activity, at each of the vicinity sensitive receptors.

Table 3.10-9
Individual Component Noise Levels due to VMT Rail Activity

	Rail Yard Activity (including layover)		Shunting Between Yard and Site		Trains Arriving/Leaving	
	Distance to Activity (feet)	*L_{eq}*	*Distance to Activity (feet)*	*L_{eq}*	*Distance to Activity (feet)*	*L_{eq}*
NSL1	2,920	28	2,015	36	3,100	44
NSL2	2,000	28	1,080	35	2,660	40
NSL3	1,455	36	690	43	2,065	47
NSL4	1,280	37	655	43	1,935	47
NSL5	460	48	460	45	790	53
NSL6	575	46	575	44	575	55
NSL7	1,600	35	1,600	37	1,600	48
NSL8	2,100	32	2,100	35	2,100	46
NSL9	1,600	35	1,600	37	1,600	48
NSL10	1,080	39	790	42	240	61

The noise levels presented in Table 3.10-9 are representative of the worst-case noise level that may occur over an hour-long period. In order to present the results in terms of L_{day}, L_{night}, and L_{dn} per the other impact assessments, noise levels have been calculated based on the following assumptions:

- A 100-car train is loaded over the course of two 10-hour shifts.
- Two switches (i.e., a small grouping of rail cars moved by a switch engine) per hour are required between the rail yard outside the site boundary and the rail transloading area which has been modeled assuming that railcar loading occurs over the course of 20 hours (i.e., two 10-hour shifts).
- When switches are not occurring there would be no idling locomotive permitted in the rail yard area.
- A worst-case of one train movement during the daytime (i.e., 07:00 hours to 22:00 hours) and one train movement at night (i.e., 22:00 hours to 07:00 hours) occurs in any 24-hour period, with each 100-car train assumed to have three locomotives.
- The same intensity of activity over any 24-hour period is assumed for both Phase 1 and Phase 2.

Table 3.10-10 presents the calculated noise levels at each vicinity noise-sensitive location based on the above assumptions. Rail activity would be limited to the hours of 8:00 p.m. – 12:00 a.m. and 4:00 a.m. and 6:00 a.m., as specified in MM-3.12-2 in Section 3.12, Transportation and Traffic. Although this mitigation is not required to reduce a significant noise impact due to rail activity, it would help to reduce annoyance from rail noise during evening hours.

Table 3.10-10
Total Noise Levels due to VMT Rail Activity

Location	Phases 1 and 2		
	L_{day}	L_{night}	L_{dn}
NSL1	38	38	43
NSL2	36	36	41
NSL3	44	43	49
NSL4	44	43	49
NSL5	50	49	55
NSL6	49	49	54
NSL7	40	41	46
NSL8	38	39	44
NSL9	40	41	46
NSL10	50	52	57

Note that the noise from locomotive warning horns was not included in this assessment as it is considered to be a sound made in the interest of public safety. Such sounds are considered to be exempt from noise impact assessments per the guidance contained within Chapter 16 of the City’s Municipal Code regarding exceptions to the City’s noise performance standards (City of Vallejo 2014).

Operations Equipment Staging Area

A small metal-framed equipment storage and maintenance building of approximately 6,000 square feet is proposed to be located at the eastern extreme of the VMT Site (refer to Appendix K-1 for illustration of location). The internal port access road would be extended south in VMT Phase 1 to allow access to this building by equipment used at the wharf. The area between the maintenance building and the southern Orcem Site boundary would be used to park equipment when not in use at the wharf. The equipment storage area and maintenance building would be located approximately 200 feet west of the nearest residential land use boundary. These facilities would not be operated between the hours of 12:00 a.m. and 6:00 a.m.

The noise impact of this equipment staging area would be limited to the noise generated by site equipment starting and warming up for 5 minutes in the morning and then returning to park in the evening. This activity is likely to result in noise levels at the nearest noise sensitive locations of NSL1 and NSL2, of 33 dB L_{eq},1-hour and 38 dB L_{eq},1-hour respectively. These noise levels are well below the existing ambient noise levels measured in this area.

Noise from Combined Operations

To assess the overall noise impact of the VMT operations, each noise source discussed in the previous sections must be added logarithmically to determine the combined noise impact. The following factors were considered in calculating the combined noise effects of all VMT operations:

- Vessel loading/unloading activity would occur continuously, i.e., 24 hours a day/7 days a week, when a vessel is moored.
- Truck movements on the local road network would increase gradually as the facilities' production increases. The results presented here are representative of the worst-case scenarios at peak production for Phases 1 and 2 respectively.
- VMT activity includes truck and train activity during Phase 1 operations.
- VMT activity includes truck, train, and barge activity during Phase 2 operations.

This represents the worst-case scenario for both Phase 1 and Phase 2. Table 3.10-11 presents the calculated results for total combined operations for the VMT project component, based on the assumptions described above.

Table 3.10-11
Noise Levels from All VMT Operations Activity (Combined)

NSL	Phase	VMT Bulk Terminal dB L_{dn}	VMT Rail dB L_{dn}	VMT Trucks dB L_{dn}	VMT Total Noise dB L_{dn}	Existing Baseline Level dB L_{dn}	Total Noise Level dB L_{dn}	Increase in Noise Level, dB L_{dn}
1	1	46	43	n/a	48	55	56	1
	2	47	43	n/a	49		56	1
2	1	54	41	n/a	54	53	57	4
	2	54	41	n/a	54		57	4
3	1	47	49	37	51	52	55	3
	2	50	49	37	53		55	3
4	1	50	49	38	53	52	55	3
	2	52	49	38	54		56	4
5	1	43	55	49	56	52	58	6
	2	47	55	49	57		58	6
6	1	35	54	61	62	57	63	6
	2	39	54	61	62		63	6
7	1	32	46	61	61	63	65	2
	2	35	46	61	61		65	2
8	1	51	44	n/a	52	54	56	2
	2	54	44	n/a	54		57	3
9	1	27	46	61	61	63	65	2
	2	31	46	61	61		65	2

Table 3.10-11
Noise Levels from All VMT Operations Activity (Combined)

NSL	Phase	VMT Bulk Terminal dB L_{dn}	VMT Rail dB L_{dn}	VMT Trucks dB L_{dn}	VMT Total Noise dB L_{dn}	Existing Baseline Level dB L_{dn}	Total Noise Level dB L_{dn}	Increase in Noise Level, dB L_{dn}
10	1	39	57	n/a	57	52	58	6
	2	42	57	n/a	57		58	6

Using the significance criteria discussed in Section 3.10.3 (A and C), Table 3.10-12 summarizes the significance determinations for the total VMT operational project-related noise level increases.

Table 3.10-12
Significance Determination for Noise Levels from All VMT Operations Activity (Combined)

NSL	Predicted Increase in Noise	Comment	Mitigation Required
1	1 dB	This is a less-than-significant permanent increase in the noise level.	No
2	4 dB	This is a less-than-significant permanent increase in the noise level.	No
3	3 dB	This is a less-than-significant permanent increase in the noise level.	No
4	3 – 4 dB	This is a less-than-significant permanent increase in the noise level.	No
5	6 dB	This is a significant permanent increase in the noise level.	Yes
6	6 dB	This is a less-than-significant permanent increase in the noise level.	No
7	2 dB	This is a less-than-significant permanent increase in the noise level.	No
8	2 – 3 dB	This is a less-than-significant permanent increase in the noise level.	No
9	2 dB	This is a less-than-significant permanent increase in the noise level.	No
10	6 dB	This is a significant permanent increase in the noise level.	Yes

Based on the information in Table 3.10-12, the increase in noise levels would exceed established polices and standards and therefore the impacts would be **significant** at the following two locations (**Impact 3.10-1**):

- NSL5 (Colt Court Residences)
- NSL10 (3rd Street Residence)

Mitigation measures to reduce this impact are provided in Section 3.10.5.

Orcem Analysis

Construction Impacts

Construction of the Orcem Plant would involve both indirect off-site noise impacts (increased traffic on local streets associated with the transport of workers, equipment, and materials to and from the project site), and noise from on-site equipment and activity. Refer to Table 3.10-5 for the noise level produced from typical construction activities.

The transport of workers and construction equipment and materials to the project site would incrementally increase noise levels on access roads leading to the Orcem Site. During the worst-case periods of construction, it is estimated that there would be up to five deliveries per day to the site using heavy trucks. Since workers and construction equipment would use existing routes, noise from slow-moving passing trucks (75 dBA L_{max} at 50 feet) would be similar to existing vehicle generated noise in the project area. For this reason, short-term intermittent noise from trucks would be minor when averaged over a longer time period. In addition, according to the City’s noise ordinance, noise from temporary transportation of goods or people to and from a given premises is exempt from the City’s noise standards. Therefore, short-term construction-related noise associated with worker and equipment transport to the proposed project site would not result in a significant impact on receptors along the access routes leading to the Orcem Site.

Noise generated during demolition of the site improvements and the structures, excavation, grading, site preparation, and building erection on the Orcem Site would result in potential noise impacts on off-site uses. Existing receptors in the vicinity, as discussed in Section 3.10.4, would be subject to short-term noise generated by construction equipment and activities on the project site when construction occurs.

According to the FHWA (RCNM), typical noise levels range up to 95 dBA L_{max} at 50 feet during the noisiest construction phases. The demolition phase, which includes impact hammers to break concrete, would generate the highest noise levels. Earth-moving equipment includes excavating machinery such as backhoes, bulldozers, front loaders, compactors, scrapers, and graders. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full-power operation, followed by 3 or 4 minutes at lower power settings. RCNM accounts for these cycles with a usage factor for each type of equipment, which are all well below 100%. The usage factor is applied to arrive at average noise levels which would be experienced during each phase of the Orcem construction process.

Table 3.10-13 presents the predicted maximum noise levels at the nearest noise-sensitive locations (i.e., NSL1, NSL2, and NSL3) for a range of expected construction activities. Appendix K-2 presents the calculation sheets for each Orcem construction phase activity at each sensitive receptor location.

Table 3.10-13
Predicted Maximum Orcem Construction Noise Levels at Closest Sensitive Receptors

Construction Activity	Type of Equipment	Predicted dBA L_{max} Levels		
		NSL1	*NSL2*	*NSL3*
Demolition	Front End Loader	52	61	57
	Excavator (x2)	57	66	62
	Crane	53	63	59
	Mounted Impact Hammer (hoe ram)	63	72	69
	Grapple (on backhoe)	60	69	65
	Dump Truck	49	58	55
Earthwork and Excavation	Backhoe	50	60	56
	Excavator (x2)	57	66	62
	Front End Loader	52	61	57
	Roller	53	63	59
	Tractor	57	66	62
	Vacuum Street Sweeper	54	64	60
Concrete and Steel Works	Concrete Mixer Truck	52	61	52
	Concrete Pump Truck	55	64	54
	Concrete Saw	63	72	62
	Crane	54	63	53
	Drum Mixer	53	63	53
	Flat Bed Truck	48	57	47
	Pneumatic Tools	59	68	58
	Welder/Torch	47	57	47

The closest noise sensitive land uses to the project construction areas are NSL1, NSL2, and NSL3 which adjoin the project site. The closest sensitive receptors within these properties are located between 400 and 1,475 feet from the Orcem construction activity listed in Table 3.10-13. At these distances, maximum noise levels from construction activities at the building site could range from 45 dBA up to 75dBA L_{max} at the property line of the nearest sensitive locations.

Since the City has not established a numeric limit for construction noise exposure, Orcem project construction would not exceed established standards, and impacts would be **less than significant**. Note that potential impacts associated with construction activities are addressed under 3.10.4.D

Operational Impacts

The Orcem operations would include four distinct types of activities with the potential for generation of noise and/or vibration. The four types of activities include:

- Fixed and mobile plant noise emissions,

- Vessel unloading activity,
- Rail activity, and
- Additional vehicular traffic on the public road network.

Each of these activities is assessed individually, and then the combined effects of all activities occurring simultaneously are evaluated.

Orcem Fixed and Mobile Plant Noise Emissions

The Orcem production process would involve four key elements with regard to noise generation as follows:

1. Transport to and storage of raw materials on the Orcem Site, including granulated blast furnace slag (GBFS), cement, and other additives.
2. Transport of raw material from storage to the process plant.
3. Drying, grinding, and blending GBFS granulate and other raw materials and additives.
4. Transport of finished ground granulated blast furnace slag (GGBFS) and cements to markets.

The Orcem project component is proposed to be implemented in the following two phases:

- Phase 1: Up to a production rate of 500,000 metric tons per year.
- Phase 2: Above 500,000 metric tons and up to a maximum production rate of 900,000 metric tons per year.

In addition, the facility would be capable of operating in several modes as follows:

- Mode 1: GBFS production only.
- Mode 2: Portland cement production only.
- Mode 3: Both GBFS and portland cement production in independent production runs.

The mode of operation would have an impact on the volume of vehicular movements on the local road network as certain modes require the importation of raw material via the road network in addition to the importation of material by vessel. In addition, Modes 2 and 3 would require a clinker storage building and associated mechanical plant to be constructed. This building is not required for Mode 1 operation.

The drying, grinding, and blending of processed raw materials to form the finished product would involve the use of a variety of components within the fixed plant on the Orcem Site. In addition to the fixed plant noise sources there would also be mobile equipment on the Orcem

Site. The mobile equipment would be a single diesel-powered wheeled loader with a bucket capacity of approximately 7 tons. The loader would transfer raw material to the mill feed hopper. Figure 3.10-6 illustrates where the loader would operate. See Appendix K-2 for a detailed description of equipment, fixed and mobile plant operating assumptions, and noise emissions levels for each piece of equipment.

AWN Consulting used a proprietary noise prediction model by Brüel & Kjær to assess the noise generation associated with each major piece of equipment and activity. Based on the assumptions of equipment, operating patterns, and facility capacity, noise model results for the Orcem fixed and mobile operations are presented below in Table 3.10-14 (Phase 1) and Table 3.10-15 (Phase 2).

Table 3.10-14
Noise Levels due to Orcem Fixed and Mobile Plant Operations – Phase 1

Location	**Phase 1**								
	Mode 1			*Mode 2*			*Mode 3*		
	L_{day}	L_{night}	L_{dn}	L_{day}	L_{night}	L_{dn}	L_{day}	L_{night}	L_{dn}
NSL1	39	47	53	43	47	53	43	47	53
NSL2	48	57	62	54	57	62	54	57	62
NSL3	46	55	60	48	54	60	48	54	60
NSL4	45	54	59	49	54	59	49	54	59
NSL5	32	41	46	37	41	47	37	41	47
NSL6	28	37	42	34	37	43	34	37	43
NSL7	28	37	42	34	37	43	34	37	43
NSL8	38	47	53	44	47	53	44	47	53
NSL9	24	33	38	30	33	39	30	33	39
NSL10	33	41	47	36	42	47	36	42	47

Table 3.10-15
Noise Levels due to Orcem Fixed and Mobile Plant Operations – Phase 2

Location	**Phase 2**								
	Mode 1			*Mode 2*			*Mode 3*		
	L_{day}	L_{night}	L_{dn}	L_{day}	L_{night}	L_{dn}	L_{day}	L_{night}	L_{dn}
NSL1	44	48	54	45	48	54	45	48	54
NSL2	56	60	66	59	60	66	59	60	66
NSL3	47	55	60	50	55	60	50	55	60
NSL4	48	54	60	51	54	60	51	54	60
NSL5	35	42	47	39	42	47	39	42	47
NSL6	32	38	43	35	38	44	35	38	44
NSL7	34	39	44	37	39	45	37	39	45

Table 3.10-15
Noise Levels due to Orcem Fixed and Mobile Plant Operations – Phase 2

Location	Phase 2								
	Mode 1			*Mode 2*			*Mode 3*		
	L_{day}	L_{night}	L_{dn}	L_{day}	L_{night}	L_{dn}	L_{day}	L_{night}	L_{dn}
NSL8	40	47	53	44	47	53	44	47	53
NSL9	32	35	41	34	36	41	34	36	41
NSL10	35	42	41	38	42	48	38	42	48

Orcem Vessel Unloading

The principal raw materials to be processed by the Orcem Plant would be GBFS and clinker, which would arrive at the proposed VMT wharf via either geared vessels or self-discharged vessels. The raw materials would be transported from the VMT wharf to the Orcem Site via a closed conveyor system to be developed as part of the Orcem Phase 1 improvements. The noise impact on the nearest sensitive locations has been evaluated using a proprietary noise prediction model by Brüel & Kjær, based on the assumption that the unloading activity would occur continuously (i.e., 24 hours per day) while a vessel is at dock. The detailed assumptions and inputs to the model for assessment of the vessel unloading activity may be found in Appendix K-2. Results of the noise model evaluation are presented in Table 3.10-16.

Table 3.10-16
Noise Levels due to Orcem Vessel Unloading Activity

Location	Phases 1 and 2 All Modes		
	L_{day}	L_{night}	L_{dn}
NSL1	39	40	46
NSL2	43	44	50
NSL3	33	34	40
NSL4	37	38	44
NSL5	32	32	39
NSL6	25	26	32
NSL7	22	22	28
NSL8	42	42	49
NSL9	22	23	29
NSL10	32	33	39

Orcem Truck Trips on Roadway Network (Off-Site)

The operational phase of the Orcem project component would generate additional heavy truck trips on the local road network. The number of truck trips serving the site therefore depends on the mode and phase of operation. Average hourly truck round-trips (i.e., trucks in and trucks out) would range from 6 to 16 during the day (7:00 a.m. to 10:00 p.m.) and from 10 to 22 overnight (10:00 p.m. to 7:00 a.m.) for three different modes in Phase 1 and Phase 2. These traffic volumes are considered worst-case as they assume that bulk deliveries by road would occur simultaneously to the export of finished product. However, it is probable that the bulk deliveries to the site would be much less frequent over the course of a full year's production. The haul route to and from the site would be via Lemon Street to the junction with Sonoma Boulevard, at which point the traffic would divert to either:

- Route 1 – Lemon Street, turning right onto I-780 and then north on I-80;
- Route 2 – Lemon Street, turning right onto I-780;
- Route 3 – Lemon Street, turning right onto Sonoma Boulevard; or
- Route 4 – Lemon Street, turning left onto Sonoma Boulevard.

Based on these assumptions, and also assuming an average truck speed of 20 mph on all local routes, the predicted worst-case noise levels from truck movements serving the Orcem Site are presented in Tables 3.10-17 and 3.10-18. Note that some receivers would not be influenced by truck trips on the local road network as they are located some distance from the road network.

Table 3.10-17
Noise Levels due to Truck Movements Associated with Orcem Operations – Phase 1

Location	Phase 1								
	Mode 1			*Mode 2*			*Mode 3*		
	L_{day}	L_{night}	L_{dn}	L_{day}	L_{night}	L_{dn}	L_{day}	L_{night}	L_{dn}
NSL1	—	—	—	—	—	—	—	—	—
NSL2	32	34	40	34	36	42	33	34	41
NSL3	29	32	38	32	33	39	31	32	38
NSL4	31	33	39	33	35	41	32	33	40
NSL5	42	44	50	44	45	51	43	44	50
NSL6	54	56	62	56	57	64	55	56	62
NSL7	48	51	57	51	53	59	51	51	58
NSL8	—	—	—	—	—	—	—	—	—
NSL9	52	54	60	54	55	61	52	54	60
NSL10	—	—	—	—	—	—	—	—	—

Table 3.10-18
Noise Levels due to Truck Movements Associated with Orcem Operations – Phase 2

Location	**Phase 2**								
	Mode 1			*Mode 2*			*Mode 3*		
	L_{day}	L_{night}	L_{dn}	L_{day}	L_{night}	L_{dn}	L_{day}	L_{night}	L_{dn}
NSL1	—	—	—	—	—	—	—	—	—
NSL2	34	36	42	36	38	44	35	36	43
NSL3	32	33	39	34	35	41	32	34	40
NSL4	33	35	41	35	37	43	34	35	42
NSL5	44	45	51	46	47	53	45	46	52
NSL6	56	57	64	58	59	66	57	58	64
NSL7	51	53	59	54	55	61	53	54	60
NSL8	—	—	—	—	—	—	—	—	—
NSL9	54	55	61	55	57	63	54	55	61
NSL10	—	—	—	—	—	—	—	—	—

Orcem Rail Activity

The existing railway serving the site would be used by Orcem to import raw materials and export finished product. The volume of material to be transported by train per month would depend on the phase of operation; however, regardless of the monthly volume throughput a maximum of one train movement to and from the site during any single 24-hour period (combined for Orcem and VMT) is representative of the worst-case for all phases and modes.

Train transport of materials by rail to/from the Orcem facility would involve the following factors:

- Arriving trains, either laden or unladen, would be parked in the proposed rail yard area to be located on the existing tracks outside the site boundary. It is expected that trains would arrive with 17 railcars.
- The railcars would then be shunted from this yard area to the rail transloading area on the VMT Site where there is capacity for 16 railcars; up to two train movements per hour between the rail transloading area and the yard area are assumed (i.e., one movement in and one movement out).
- Locomotive would not idle within the yard while waiting to shunt railcars.
- A low noise emission genset switcher is proposed which has a noise emission level 10 dB below a standard freight locomotive.
- Product import/export would be transloaded to or from the railcars using sealed trucks which pump the product to or from the railcar.

- Loaded or unloaded railcars would be shunted back to the rail yard area outside the site boundary to await collection by the locomotive.
- It is expected to require 9 hours to load or unload a train.

Figure 3.10-7 illustrates the locations for components or activities described above.

Rail activity noise generation was assessed using the CREATE railroad noise modeling spreadsheet which is based on the FTA procedures for the assessment of transit noise and vibration. Please refer to Appendix K-2 for the complete assumptions and inputs to the CREATE spreadsheet.

Table 3.10-19 provides the results of the modeling, presented as noise levels for each component rail activity, at each of the vicinity sensitive receptors.

Table 3.10-19
Individual Component Noise Levels due to Orcem Rail Activity

Location	Rail Yard Activity (including layover)		Shunting Between Yard and Site		Trains Arriving/Leaving	
	Distance to Activity (feet)	*L_{eq}*	*Distance to Activity (feet)*	*L_{eq}*	*Distance to Activity (feet)*	*L_{eq}*
NSL1	2,920	28	2,015	43	3,100	38
NSL2	2,000	32	1,080	47	2,660	39
NSL3	1,455	36	690	50	2,065	41
NSL4	1,280	37	655	50	1,935	41
NSL5	460	48	460	52	790	47
NSL6	575	46	575	51	575	49
NSL7	1,600	35	1,600	44	1,600	42
NSL8	2,100	32	2,100	43	2,100	41
NSL9	1,600	35	1,600	44	1,600	42
NSL10	1,080	39	790	49	240	55

The noise levels presented in Table 3.10-19 are representative of the worst-case noise level that may occur over an hour-long period for the average exposure within the NSL sites listed. In addition to the rail activity noise, it is also necessary to consider the noise from truck movements to and from the rail transloading area that would occur when loading or unloading a train. Based on the volume of material to be transported by rail and the 9-hour loading period, a total of 66 truckloads would be required between the Orcem facility and the train loading area.

In order to present the results in terms of L_{day}, L_{night} and L_{dn} per the other impact assessments, noise levels have been calculated based on the following assumptions:

- A 17-car train is loaded over the course of 9 hours during the day.

- Two switches per hour are required between the rail yard outside the site boundary and the rail transloading area.
- When switches are not occurring, there would be no idling locomotive permitted in the rail yard area.
- A worst-case of two train movements during the daytime (i.e., 07:00 hours to 22:00 hours), representing an arrival and departure, with each 17-car train is assumed to have 1 locomotive.
- The same intensity of activity over any 24-hour period is assumed for both Phase 1 and Phase 2.

Table 3.10-20 presents the calculated noise levels at each vicinity noise-sensitive location based on the above assumptions. Rail activity would be limited to the hours of 8:00 p.m. – 12:00 a.m. and 4:00 a.m. and 6:00 a.m., as specified in MM-3.12-2 in Section 3.12, Transportation and Traffic. Although this mitigation is not required to reduce a significant noise impact due to rail activity, it would help to reduce annoyance from rail noise during evening hours.

Table 3.10-20
Total Noise Levels due to Orcem Rail Activity

Location	Calculated Noise Level, dB		
	L_{day}	L_{night}	L_{dn}
NSL1	41	0	39
NSL2	46	0	44
NSL3	48	0	46
NSL4	48	0	46
NSL5	51	0	49
NSL6	50	0	48
NSL7	43	0	41
NSL8	41	0	39
NSL9	43	0	41
NSL10	50	0	47

Note that the noise from locomotive warning horns has not been included in this assessment as it is considered to be a sound made in the interest of public safety. Such sounds are exempt from noise impact assessments as per the guidance contained within Chapter 16 of the City of Vallejo's Municipal Code regarding exceptions to the City's noise performance standards.

Noise from Combined Orcem Operations

To assess the overall noise impact of the Orcem operations, each noise source discussed in the previous sections must be added logarithmically to determine the combined noise impact. The following factors were considered in calculating the combined noise effects of all Orcem operations:

- The Orcem production facility would operate continuously for 24 hours a day in accordance with the hours of operation discussed in Chapter 2.0, Project Description.
- Truck movements on the local road network would increase gradually as the facility's production increases. The results presented here represent the worst-case scenarios at peak production for Phases 1 and 2 respectively.
- During Phase 1, up to 13 vessels per year are expected to serve the Orcem Site, increasing to 19 at peak production in Phase 2. When docked, it is expected to take approximately 3 days to unload using a conveyor system.
- The number of trains per year serving the Orcem facility would range from up to 36 trains in Phase 1 to a maximum of 100 trains per annum in Phase 2; however, in any given 24-hour period, a single train would be able to arrive, be loaded or unloaded, and depart. Please note that there would be no rail activity if the site operates under Mode 2.

In order to present as realistic an assessment as possible the following three modeling scenarios have been assessed for both phases of the Orcem project component:

A. Scenario A – noise impact of Orcem production and truck movements on the local road network. This represents the proposed normal operation of the Orcem Plant when there would be no vessel unloading or rail activity.

B. Scenario B (including mitigation) – noise impact of Orcem production and truck movements, plus the temporary noise impact of vessel unloading to the Orcem Site.

C. Scenario C (including mitigation) – noise impact of Orcem production and truck movements, plus the temporary noise impact of vessel unloading and rail activity to the Orcem Site.

Of the three modeling scenarios, Scenario A represents the proposed normal day-to-day operation of the Orcem facility covering production and product transport off site using truck movements on the local road network. Scenarios B and C consider the addition of vessel unloading activity and rail loading activity respectively. Scenario C is the worst-case in which the facility would be in full production, a vessel would be unloaded and product would be exported off site by both truck and rail.

Orcem Combined Noise – Scenario A (Orcem Plant Operation Plus Truck Noise Only)

Scenario A represents normal daily operation of the Orcem Plant, when neither vessel nor rail loading activities would occur. Table 3.10-21 presents the results of the combined Orcem noise generation levels at vicinity noise-sensitive receptors for Scenario A.

Table 3.10-21
Noise Levels from All Orcem Operations Activity
Plus Truck Movements (Combined) – Scenario A

Location	Phase	Mode	Orcem Plant dB L_{dn}	Orcem Trucks dB L_{dn}	Orcem Total Noise dB L_{dn}	Existing Baseline dB L_{dn}	Total Noise Level dB L_{dn}	Increase in Noise dB L_{dn}
NSL1	1	1	52	n/a	52	55	57	2
		2	54	n/a	54		58	3
		3	54	n/a	54		58	3
	2	1	54	n/a	54		58	3
		2	54	n/a	54		58	3
		3	54	n/a	54		58	3
NSL2	1	1	60	40	60	53	61	8
		2	63	42	63		63	10
		3	63	41	63		63	10
	2	1	66	42	66		66	13
		2	66	44	66		66	13
		3	66	43	66		66	13
NSL3	1	1	60	38	60	52	61	9
		2	61	39	61		62	10
		3	61	38	61		62	10
	2	1	60	39	60		61	9
		2	60	41	60		61	9
		3	60	40	60		61	9
NSL4	1	1	60	39	60	52	61	9
		2	61	41	61		62	10
		3	61	40	61		62	10
	2	1	60	41	60		61	9
		2	60	43	60		61	9
		3	60	42	60		61	9
NSL5	1	1	47	50	52	52	55	3
		2	48	51	53		55	3
		3	48	50	52		55	3
	2	1	47	51	52		55	3
		2	47	53	54		56	4
		3	47	52	53		56	4

Table 3.10-21
Noise Levels from All Orcem Operations Activity Plus Truck Movements (Combined) – Scenario A

Location	Phase	Mode	Orcem Plant dB L_{dn}	Orcem Trucks dB L_{dn}	Orcem Total Noise dB L_{dn}	Existing Baseline dB L_{dn}	Total Noise Level dB L_{dn}	Increase in Noise dB L_{dn}
NSL6	1	1	43	62	62	57	63	6
		2	44	64	64		65	8
		3	44	62	62		63	6
	2	1	34	64	64		65	8
		2	44	66	66		67	10
		3	44	64	64		65	8
NSL7	1	1	42	57	57	63	64	1
		2	44	59	59		64	1
		3	44	58	58		64	1
	2	1	44	59	59		64	1
		2	45	61	61		65	2
		3	45	60	60		65	2
NSL8	1	1	53	n/a	53	54	57	3
		2	54	n/a	54		57	3
		3	54	n/a	54		57	3
	2	1	53	n/a	53		57	3
		2	53	n/a	53		57	3
		3	53	n/a	53		57	3
NSL9	1	1	39	60	60	63	65	2
		2	40	61	61		65	2
		3	40	60	60		65	2
	2	1	41	61	61		65	2
		2	41	63	63		66	3
		3	41	61	61		65	2
NSL10	1	1	48	n/a	48	52	53	1
		2	49	n/a	49		54	2
		3	49	n/a	49		54	2
	2	1	47	n/a	47		53	1
		2	48	n/a	48		53	1
		3	48	n/a	48		53	1

Table 3.10-22 summarizes the noise impacts and identifies those locations where a significant increase in the existing ambient noise level may occur.

Table 3.10-22
Significance Determination for Noise Levels from All Orcem Operations Activity Plus Truck Movements (Combined) – Scenario A

Location	Predicted Increase in Noise	Comment	Mitigation Required
NSL1	2 – 3 dB	This is a less-than-significant permanent increase in the noise level.	No
NSL2	8 – 13 dB	This is a significant permanent increase in the noise level according to the CEQA checklist.	Yes
NSL3	9 – 10 dB	This is a significant permanent increase in the noise level according to the CEQA checklist.	Yes
NSL4	9 – 10 dB	This is a significant permanent increase in the noise level according to the CEQA checklist.	Yes
NSL5	3 – 4 dB	This is a less-than-significant permanent increase in the noise level.	No
NSL6	6 – 10 dB	This is a less-than-significant permanent increase in the noise level.	No
NSL7	1 – 2 dB	This is a less-than-significant permanent increase in the noise level.	No
NSL8	3 dB	This is a less-than-significant permanent increase in the noise level.	No
NSL9	2 – 3 dB	This is a less-than-significant permanent increase in the noise level.	No
NSL10	1 – 2 dB	This is a less-than-significant permanent increase in the noise level.	No

As shown in Table 3.10-22, three locations in Scenario A would be exposed to an increase in noise levels that exceed the applicable policies and standards:

- NSL2 (Seawitch Lane Residences)
- NSL3 (Harbor Park Apartments)
- NSL4 (Browning Way Residences)

Therefore, noise impacts under Scenario A of the Orcem project component would be **significant** (**Impact 3.10-2**), and mitigation is provided in Section 3.10.5. Scenario A is considered the most basic operating mode for Orcem, where transportation would be achieved with trucks alone. This mode would occur approximately 75% of the time, in the periods between the arrival of either a vessel or a train to the facility.

Orcem Combined Noise – Scenario B (Orcem Plant Operation Plus Truck Noise Plus Vessels)

Scenario B represents the situation in which the Scenario A operation would be supplemented by vessel unloading activity. Because Scenario A alone was found to have significant noise impacts, mitigation measures are required to address normal Orcem operations (Section 3.10.5); the analysis of Scenario B assumes the required mitigation measures for normal Orcem operations have been implemented. While the frequency of vessel unloading activity would increase as the output of the Orcem manufacturing facility increases, the intensity of the activity would be similar for all phases. Once a vessel is at dock, the material would be unloaded by conveyor operating continuously for 2 – 3 days. Therefore, the noise level due to vessel unloading at a noise-sensitive location would be the same for each mode and phase.

Table 3.10-23 presents the noise modeling results for Scenario B. To reiterate, the reduction in Orcem Plant operations noise from incorporation of the identified required mitigations in Scenario A is assumed in the following results.

Table 3.10-23
Noise Levels from All Orcem Operations Activity Plus Truck Movements Plus Vessel Unloading (Combined) – Scenario B

Location	Phase	Mode	Orcem Plant dB L_{dn}	Orcem Trucks dB L_{dn}	Orcem Total Noise dB L_{dn}	Existing Baseline dB L_{dn}	Total Noise Level dB L_{dn}	Increase in Noise dB L_{dn}
NSL1	1	1	45	46	49	55	56	1
		2	46	46	49		56	1
		3	46	46	49		56	1
	2	1	46	46	49		56	1
		2	45	46	49		56	1
		3	45	46	49		56	1
NSL2	1	1	55	50	56	53	58	5
		2	55	50	56		58	5
		3	55	50	56		58	5
	2	1	55	50	56		58	5
		2	56	50	57		59	6
		3	51	50	57		59	6
NSL3	1	1	52	40	51	52	55	3
		2	52	40	52		55	3
		3	52	40	52		55	3
	2	1	52	40	52		55	3
		2	52	40	53		55	3
		3	52	40	53		55	3
NSL4	1	1	52	44	52	52	55	3
		2	53	44	53		56	4
		3	53	44	53		56	4
	2	1	53	44	53		56	4
		2	53	44	54		56	4
		3	53	44	54		56	4
NSL5	1	1	50	39	51	52	54	2
		2	52	39	52		55	3
		3	51	39	51		55	3
	2	1	52	39	52		55	3

Table 3.10-23
Noise Levels from All Orcem Operations Activity Plus Truck Movements Plus Vessel Unloading (Combined) – Scenario B

Location	Phase	Mode	Orcem Plant dB L_{dn}	Orcem Trucks dB L_{dn}	Orcem Total Noise dB L_{dn}	Existing Baseline dB L_{dn}	Total Noise Level dB L_{dn}	Increase in Noise dB L_{dn}
		2	53	39	54		56	4
		3	52	39	53		55	3
NSL6	1	1	62	32	62	57	63	6
		2	64	32	64		65	8
		3	62	32	62		63	6
	2	1	64	32	64		65	8
		2	66	32	66		67	10
		3	64	32	64		65	8
NSL7	1	1	57	28	57	63	64	1
		2	59	28	59		64	1
		3	58	28	58		64	1
	2	1	59	28	59		64	1
		2	61	28	61		65	2
		3	60	28	60		65	2
NSL8	1	1	48	49	51	54	56	2
		2	48	49	52		56	2
		3	48	49	52		56	2
	2	1	48	49	52		56	2
		2	49	49	52		56	2
		3	49	49	52		56	2
NSL9	1	1	60	29	60	63	65	2
		2	61	29	61		65	2
		3	60	29	60		65	2
	2	1	61	29	61		65	2
		2	63	29	63		66	3
		3	61	29	61		65	2
NSL10	1	1	38	39	42	52	52	0
		2	40	39	42		52	0
		3	40	39	42		52	0
	2	1	40	39	42		52	0
		2	40	39	43		52	0
		3	40	39	43		52	0

Table 3-10.24 summarizes the noise impacts and identifies those locations where a significant increase in the existing ambient noise level may occur for Scenario B.

Table 3.10-24
Significance Determination for Noise Levels from All Orcem Operations Activity Plus Truck Movements Plus Vessel Unloading (Combined) –Scenario B

Location	Predicted Increase in Noise	Comment	Mitigation Required
NSL1	1 dB	This is a less-than-significant permanent increase in the noise level.	No
NSL2	5 – 6 dB	This is a significant temporary increase in the noise level according to the CEQA checklist.	See Discussion
NSL3	3 dB	This is a less-than-significant permanent increase in the noise level.	No
NSL4	3 – 4 dB	This is a less-than-significant permanent increase in the noise level.	No
NSL5	2 – 4 dB	This is a less-than-significant permanent increase in the noise level.	No
NSL6	6 – 10 dB	This is a less-than-significant permanent increase in the noise level.	No
NSL7	1 – 2 dB	This is a less-than-significant permanent increase in the noise level.	No
NSL8	3 dB	This is a less-than-significant permanent increase in the noise level.	No
NSL9	2 – 3 dB	This is a less-than-significant permanent increase in the noise level.	No
NSL10	0 dB	This is a less-than-significant permanent increase in the noise level.	No

The majority of locations show no change in the noise level for Scenario B when compared to Scenario A with mitigation. However, during Phase 2 of the Orcem project component, there would be a slight exceedance of 1dB above the allowed increase of 5 dB over ambient. It should be noted, however, that the threshold for project-generated noise increases is intended to address the prevalent noise generation from routine operations, and not necessarily noise levels from lower frequency events associated with a facility. Also, a 1 dBA difference in environmental noise levels is not detectable by the human ear, and therefore the difference between a 5 dBA and a 6 dBA L_{dn} increase would not be deemed noticeable. Consequently, considering the temporary nature of the activity, once a month in Phase 1 and up to once every 3 weeks in Phase 2, the impact would not be felt on a continuous basis by proximate residential properties. As such, the less than 1 dBA exceedance of the noise criterion on a periodic, rather than continuous basis is deemed to be a **less-than-significant** noise impact.

Orcem Combined Noise – Scenario C (Orcem Plant Operation Plus Truck, Train, and Vessel Unloading Noise)

Scenario C represents the situation in which the Scenario A and B operations would be supplemented by train loading/unloading activity. Because Scenario A alone was found to have significant noise impacts, mitigation measures are required to address normal Orcem operations (Section 3.10.5); the analysis of Scenario C assumes the required mitigation measures for normal Orcem operations have been implemented. While the frequency of train activity would increase as the output of the Orcem manufacturing facility increases, the intensity of the activity would be similar for all phases. A maximum of one train movement to and from the site during any single 24-hour period is representative of the worst-case for all phases and modes. Table 3.10-25 presents the noise modeling results for Scenario C. To reiterate, the reduction in Orcem Plant operations noise from incorporation of the identified required mitigations in Scenario A is assumed in the following results.

Table 3.10-25
Noise Levels from All Orcem Operations Activity Plus Truck Movements Plus Vessel Unloading, Plus Rail (Combined) – Scenario C

Location	Phase	Mode	Orcem Plant dB L_{dn}	Orcem Trucks dB L_{dn}	Orcem Total Noise dB L_{dn}	Existing Baseline dB L_{dn}	Total Noise Level dB L_{dn}	Increase in Noise dB L_{dn}
NSL1	1	1	45	39	46	55	56	1
		2	46	0	46		56	1
		3	46	39	47		56	1
	2	1	46	39	47		56	1
		2	45	0	45		55	0
		3	45	39	46		56	1
NSL2	1	1	55	44	55	53	57	4
		2	55	0	55		57	4
		3	55	44	55		57	4
	2	1	55	44	55		57	4
		2	56	0	56		58	5
		3	56	44	56		58	5
NSL3	1	1	51	46	52	52	55	3
		2	52	0	52		55	3
		3	52	46	53		55	3
	2	1	52	46	53		55	3
		2	52	0	53		55	3
		3	52	46	53		56	4
NSL4	1	1	52	46	53	52	55	3
		2	53	0	53		55	3
		3	53	46	54		56	4
	2	1	53	46	54		56	4
		2	53	0	53		56	4
		3	53	46	54		56	4
NSL5	1	1	50	49	53	52	55	3
		2	52	0	52		55	3
		3	51	49	53		55	3
	2	1	52	49	53		56	4
		2	53	0	53		56	4
		3	52	49	54		56	4

Table 3.10-25
Noise Levels from All Orcem Operations Activity Plus Truck Movements Plus Vessel Unloading, Plus Rail (Combined) – Scenario C

Location	Phase	Mode	Orcem Plant dB L_{dn}	Orcem Trucks dB L_{dn}	Orcem Total Noise dB L_{dn}	Existing Baseline dB L_{dn}	Total Noise Level dB L_{dn}	Increase in Noise dB L_{dn}
NSL6	1	1	62	48	62	57	63	6
		2	64	0	64		65	8
		3	62	48	62		63	6
	2	1	64	48	64		65	8
		2	66	0	66		57	10
		3	64	48	64		65	8
NSL7	1	1	57	41	57	63	64	1
		2	59	0	59		64	1
		3	58	41	58		64	1
	2	1	59	41	59		64	1
		2	61	0	61		65	2
		3	60	41	60		65	2
NSL8	1	1	48	39	48	54	55	1
		2	48	0	48		55	1
		3	48	39	49		55	1
	2	1	48	39	49		55	1
		2	49	0	49		55	1
		3	49	39	49		55	1
NSL9	1	1	60	41	60	63	65	2
		2	61	0	61		65	2
		3	60	41	60		65	2
	2	1	61	41	61		65	2
		2	63	0	63		66	3
		3	61	41	61		65	2
NSL10	1	1	38	47	48	52	53	1
		2	40	0	40		52	0
		3	40	47	48		54	2
	2	1	40	47	48		54	2
		2	40	0	40		52	0
		3	40	47	48		54	2

Table 3.10-26 summarizes the noise impacts and identifies those locations where a significant increase in the existing ambient noise level may occur for Scenario C.

Table 3.10-26
Significance Determination for Noise Levels from All Orcem Operations Activity Plus Truck Movements Plus Vessel Unloading, Plus Rail (Combined) –Scenario C

Location	Predicted Increase in Noise	Comment	Mitigation Required
NSL1	0 – 1 dB	This is a less-than-significant permanent increase in the noise level.	No
NSL2	4 – 5 dB	This is a less-than-significant permanent increase in the noise level.	No
NSL3	3 – 4 dB	This is a less-than-significant permanent increase in the noise level.	No
NSL4	3 – 4 dB	This is a less-than-significant permanent increase in the noise level.	No
NSL5	3 – 4 dB	This is a less-than-significant permanent increase in the noise level.	No
NSL6	6 – 10 dB	This is a less-than-significant permanent increase in the noise level.	No
NSL7	1 – 2 dB	This is a less-than-significant permanent increase in the noise level.	No
NSL8	1 dB	This is a less-than-significant permanent increase in the noise level.	No
NSL9	2 – 3 dB	This is a less-than-significant permanent increase in the noise level.	No
NSL10	0 – 2 dB	This is a less-than-significant permanent increase in the noise level.	No

None of the assessed locations show a change in the noise level for Scenario C when compared to normal operations of the Orcem facility (Scenario A) with the required mitigations implemented (Section 3.10.5). Therefore, rail activity associated with the Orcem Site would not result in any additional significant impacts requiring mitigation. Impacts would therefore be **less than significant**.

Combined VMT and Orcem Analysis

Construction Impacts

As described under both the VMT and Orcem analyses, construction noise impacts would include indirect off-site noise associated with traffic trips for workers and materials and on-site noise from equipment and construction activities. The transport of workers and construction equipment and materials to the project site would incrementally increase noise levels on access roads leading to the site. Because workers and construction equipment would use existing routes, noise from slow-moving passing trucks (75 dBA L_{max} at 50 feet) would be similar to existing vehicle-generated noise. For this reason, short-term intermittent noise from trucks would be minor when averaged over a longer time period. In addition, according to the City's noise ordinance, noise from temporary transportation of goods or people to and from a given premise is exempt from the City's noise standards.

Noise generated during demolition, excavation, grading, site preparation, and building construction on the project site would result in potential noise impacts on off-site uses. Existing receptors in the vicinity, as discussed in Section 3.10.3, would be subject to short-term noise generated by construction equipment and activities on the project site when construction occurs. Noise from on-site construction, including heavy construction equipment operation and activities, was assessed for each project using the FHWA RCNM. Refer to the construction noise discussion of VMT and Orcem for a detailed description of the methodology. While it is envisioned that both developments would be constructed simultaneously (with the exception of VMT's Phase 2), it is difficult to know in advance exactly how each phase of construction would overlap on both sites. Therefore, Table 3.10-27 presents the predicted maximum noise levels at these nearest noise-sensitive locations for a range of expected construction activities for both developments. The major difference in construction between the two project components would be the installation of pilings as part of the VMT project component.

Table 3.10-27
Predicted Maximum VMT and Orcem Construction Noise Levels at Closest Sensitive Receptors

Construction Activity	Type of Equipment	Predicted dBA L_{max} Levels					
		VMT Construction			*Orcem Construction*		
		NSL1	*NSL2*	*NSL3*	*NSL1*	*NSL2*	*NSL3*
Demolition	Front End Loader	47	52	56	52	61	57
	Excavator (x2)	52	57	61	57	66	62
	Crane	49	54	57	53	63	59
	Mounted Impact Hammer (hoe ram)	58	64	67	63	72	69
	Grapple (on backhoe)	55	60	64	60	69	65
	Dump Truck	45	50	53	49	58	55
Earthwork and Excavation	Backhoe	56	60	55	50	60	56
	Excavator (x2)	62	67	61	57	66	62
	Front End Loader	57	62	56	52	61	57
	Roller	57	63	57	53	63	59
	Tractor	62	67	61	57	66	62
	Vacuum Street Sweeper	60	64	59	54	64	60
Piling	Impact Pile Driver	72	75	74	No piling required		
Concrete and Steel Works	Concrete Mixer Truck	57	61	56	52	61	52
	Concrete Pump Truck	60	64	59	55	64	54
	Concrete Saw	68	72	67	63	72	62
	Crane	59	63	58	54	63	53
	Drum Mixer	59	62	57	53	63	53
	Flat Bed Truck	53	56	51	48	57	47
	Pneumatic Tools	64	67	62	59	68	58
	Welder/Torch	53	56	51	47	57	47

The closest noise-sensitive land uses to the project construction areas are NSL1, NSL2, and NSL3 which adjoin the project site. These properties are located between 360 and 1,427 feet from the construction activity modeled in Table 3.10-27. At these distances, maximum noise levels from construction activities at either building site could range from 45 dBA up to 75 dBA L_{max} at the property line of the nearest sensitive locations. In a worst-case scenario, if the most noise-intensive construction activity were to occur simultaneously on both the VMT and Orcem Sites, maximum construction noise could range up to 78 dBA L_{max} at the property line of the nearest sensitive locations (the sum of 75 dBA plus 75 dBA). This noise level would be just noticeable to an average resident, compared to the 75 dBA maximum noise level from either of the two project components alone.

Since the City has not established a numeric limit for construction noise exposure, impacts would be **less than significant**. For a detailed discussion of the assessment methodology and potential impacts associated with short-term construction please refer to the construction noise discussion of VMT and Orcem in Section 3.10.4.

Operational Noise

The operational phases of both the VMT and Orcem project components have been assessed separately earlier in this section. In both instances, a series of mitigation measures (see Section 3.10.5) have been developed to control the individual noise impact of each development. This section examines the noise impact of both project components operating together, and assumes the separately required mitigation measures for each project component are implemented.

In order to assess the worst-case scenario for operational noise from the combined project components, the following analysis includes noise generated by Orcem production, rail and truck movements on the local road network, plus noise generated by VMT unloading a vessel and transporting material by truck, rail, and barge. Note that a lower noise impact would occur during actual operations due to the low probability of all noise sources operating simultaneously. Notwithstanding this, the worst-case scenario has been presented.

Table 3.10-28 presents the results of the combined VMT and Orcem noise generation levels at vicinity noise-sensitive receptors. The identified noise levels account for the mitigation measures already developed separately for VMT and Orcem, as identified in Section 3.10.5.

Table 3.10-28
Combined Noise Levels from All VMT and Orcem Operations Activity

Location	Phase	Mode	Orcem dB L_{dn}	VMT dB L_{dn}	Project Total Noise dB L_{dn}	Existing Baseline dB L_{dn}	Total Noise Level dB L_{dn}	Increase in Noise dB L_{dn}
NSL1	1	1	45	47		55	56	1
		2	46	47			56	1
		3	46	47			56	1
	2	1	46	47			56	1
		2	45	47			56	1
		3	45	47			56	1
NSL2	1	1	55	51		53	58	5
		2	55	51			58	5
		3	55	51			58	5
	2	1	55	51			58	5
		2	56	51			59	6
		3	56	51			59	6
NSL3	1	1	51	49		52	56	4
		2	52	49			56	4
		3	52	49			56	4
	2	1	52	49			56	4
		2	52	49			56	4
		3	52	49			56	4
NSL4	1	1	52	51		52	56	4
		2	53	51			57	5
		3	53	51			57	5
	2	1	53	51			57	5
		2	53	51			57	5
		3	53	51			57	5
NSL5	1	1	50	55		52	58	6
		2	52	55			58	6
		3	51	55			58	6
	2	1	52	55			58	6
		2	53	55			58	6
		3	52	55			58	6
NSL6	1	1	62	62		57	65	8
		2	64	62			66	9
		3	62	62			67	10
	2	1	64	62			66	9
		2	66	62			67	10
		3	64	62			66	9
NSL7	1	1	57	61	63	63	66	3
		2	59	61	63		66	3

Table 3.10-28
Combined Noise Levels from All VMT and Orcem Operations Activity

Location	Phase	Mode	Orcem dB L_{dn}	VMT dB L_{dn}	Project Total Noise dB L_{dn}	Existing Baseline dB L_{dn}	Total Noise Level dB L_{dn}	Increase in Noise dB L_{dn}
		3	58	61	63		66	3
	2	1	59	61	63		66	3
		2	61	61	64		67	4
		3	60	61	64		66	3
NSL8	1	1	48	51	53	54	57	3
		2	48	51	53		57	3
		3	48	51	53		57	3
	2	1	48	51	53		57	3
		2	49	51	53		57	3
		3	49	51	53		57	3
NSL9	1	1	60	61	64	63	66	3
		2	61	61	64		67	4
		3	60	61	64		66	3
	2	1	61	61	64		67	4
		2	63	61	65		67	4
		3	61	61	64		67	4
NSL10	1	1	38	38	53	52	55	3
		2	40	40	53		55	3
		3	40	40	53		55	3
	2	1	40	40	53		55	3
		2	40	40	53		55	4
		3	40	40	53		55	4

Table 3.10-29 summarizes the noise impacts of the combined project components, and identifies those locations where a significant increase in the existing ambient noise level may occur.

Table 3.10-29
Significance Determination for Combined Noise Levels from All VMT and Orcem Operations

Location	Predicted Increase in Noise	Comment	Mitigation Required
NSL1	1 dB	This is a less-than-significant permanent increase in the noise level.	No
NSL2	5 – 6 dB	This is a less-than-significant permanent increase in the noise level.	See Discussion
NSL3	4 dB	This is a less-than-significant permanent increase in the noise level.	No
NSL4	4 – 5 dB	This is a less-than-significant permanent increase in the noise level.	No

Table 3.10-29
Significance Determination for Combined Noise Levels from All VMT and Orcem Operations

Location	Predicted Increase in Noise	Comment	Mitigation Required
NSL5	6 dB	This is a less-than-significant permanent increase in the noise level.	See Discussion
NSL6	8 – 10 dB	This is a less-than-significant permanent increase in the noise level.	No
NSL7	3 – 4 dB	This is a less-than-significant permanent increase in the noise level.	See Discussion
NSL8	3 dB	This is a less-than-significant permanent increase in the noise level.	No
NSL9	3 – 4 dB	This is a less-than-significant permanent increase in the noise level.	See Discussion
NSL10	3 – 4 dB	This is a less-than-significant permanent increase in the noise level.	No

At NSL2, NSL5, NSL7, and NSL9, there would be a very slight increase of less than 1 dBA above the allowable increase of 3 or 5 dBA; the actual exceedance is of the order of 0.5 dBA and due to rounding, a slight exceedance is identified. An exceedance of this magnitude is imperceptible, and it is considered impractical to provide mitigation for such a small amount.

Increases in ambient noise levels from combined noise emissions from VMT and Orcem at all other locations assessed would be below the threshold of significance for a permanent and significant noise impact to occur.

Therefore, combined VMT and Orcem project noise increases at all locations assessed are considered to below the threshold of significance set forth in the City of Vallejo’s applicable policies and standards, resulting in a **less-than-significant** noise impact.

B) Would the project expose persons to or generate excessive groundborne vibration or groundborne noise levels?

VMT Analysis

Construction Impacts

Construction activities associated with implementation of the VMT project component could temporarily expose persons in the vicinity of the project site to excessive groundborne vibration or groundborne noise levels. Typical vibration source levels for construction equipment are shown in Table 3.10-30.

Table 3.10-30
Typical Construction Ground Vibration Levels

Type of Equipment		VdB @ 25 feet
Pile Driver (impact)	Upper Range	112
	Typical	104
Pile Driver (sonic)	Upper Range	105
	Typical	93
Clam shovel drop (slurry wall)		94
Hydromill (slurry wall)	In Soil	66
	In Rock	75
Vibratory roller		94
Hoe ram		87
Large bulldozer		87
Caisson drilling		87
Loaded trucks		86
Jackhammer		79
Small bulldozer		58

Source: FTA 2006.

The main concern associated with ground-borne vibration is annoyance; however, in extreme cases, vibration can cause damage to buildings, particularly those that are old or otherwise fragile. Some common sources of ground-borne vibration are trains, and construction activities such as blasting, pile-driving, and heavy earth-moving equipment. The primary source of ground-borne vibration occurring as part of the project is construction activity.

The City Performance Standards (Chapter 16.72 of the Code of Ordinances) restrict any land use from producing vibration levels that are discernible without instruments at any point on the property line on which the use is located. According to the California Department of Transportation (Caltrans), the highest measured vibration level during highway construction was 2.88 inches/second PPV at 10 feet from a pavement breaker. Other typical construction activities and equipment, such as D-8 and D-9 Caterpillars, earthmovers, and trucks have not exceeded 0.10 inch/second PPV at 10 feet. Vibration-sensitive instruments and operations may require special consideration during construction. Vibration criteria for sensitive equipment and operations are not defined and are often case-specific. As a guide, major construction activity within 200 feet and pile driving within 600 feet may be potentially disruptive to sensitive operations (Caltrans 2002).

The proposed pile-driving activity required during the construction of the VMT project component would be located at the water's edge at the position of the new concrete pile supported wharf, which would be over 900 feet from the nearest noise-sensitive residence. Groundborne vibration levels from the operation of heavy construction equipment that would be used in demolition or construction of the VMT project component would therefore not be expected to cause damage to residential buildings of normal California construction.

Given the location of the nearest sensitive receptors to the VMT Site, and the distance between them and the construction activity, in particular pile driving for the dock at a distance of 900 feet or greater, it is unlikely that there would be any perceptible vibration off site during construction activity. Therefore, vibration impacts during construction of the VMT project component are considered **less than significant.**

Operational Impacts

The VMT project component would not generate any significant groundborne vibrations as a result of its operations aside from vibration caused by rail operations as described previously under Threshold A. For rail operations, one of the major sources of noise and vibration would be rolling stock on the existing jointed track; this is considered a **significant** vibration impact **(Impact 3.10-3)**. Refer to required mitigation measure MM-3.10-1a in Section 3.10.5.

In relation to truck trips on the local road network, there is potential for some groundborne vibrations to be generated by discontinuities in the road surface. However, since the road surface within the VMT Site would be smooth and well-maintained, the potential for these vibrations would be substantially reduced. Therefore, significant groundborne vibration is not anticipated as a result of VMT operation, and impacts would be **less than significant**.

Orcem Analysis

Construction Impacts

The City's Performance Standards (Chapter 16.72 of the Code of Ordinances) restrict any land use from producing vibration levels that are discernible without instruments at any point on the property line on which the use is located.

According to Caltrans, the highest measured vibration level during highway construction was 2.88 inches/second PPV at 10 feet from a pavement breaker. Other typical construction activities and equipment, such as D-8 and D-9 Caterpillars, earthmovers, and trucks, have not exceeded 0.10 inch/second PPV at 10 feet. As a guide, major construction activity within 200 feet may be potentially disruptive to sensitive operations (Caltrans 2002).

No demolition or construction activity for Orcem would occur within 200 feet of an existing residential property line. Refer to Table 3.10-30 for vibration levels associated with typical construction equipment and activities. Groundborne vibration levels from the operation of heavy construction equipment that would be used in demolition or construction of the proposed project would therefore not be expected to cause damage to residential buildings of normal northern California construction.

Given the location of the nearest sensitive receptors to the site, and the distance between them and the construction activity, it is unlikely that there would be any perceptible vibration off-site during construction activity. Therefore, vibration impacts during construction are considered **less than significant.**

Operational Impacts

During the operational phase of the Orcem project component, the Orcem facility would not be expected to generate any significant groundborne vibrations as a result of its operation. All mechanical equipment within the plant would be designed and mounted so as to reduce vibrations. This would be included in the Orcem Site's general maintenance program as excessive vibrations typically increase the likelihood of mechanical failure.

In relation to truck trips on the local road network, there is potential for some groundborne vibrations to be generated by discontinuities in the road surface. However, since the road surface within the Orcem Site would be smooth and well-maintained, the potential for these vibrations would be substantially reduced.

In summary, no significant groundborne vibration would be generated as a result of Orcem operation. Therefore, impacts would be **less than significant**.

Combined VMT and Orcem Analysis

Construction Impacts

Refer to Table 3.10-30 for vibration levels associated with typical construction equipment and activities. The Vallejo City Performance Standards (Chapter 16.72 of the Code of Ordinances) restrict any land use from producing vibration levels that are discernible without instruments at any point on the property line on which the use is located.

According to Caltrans, the highest measured vibration level during highway construction was 2.88 inches/second PPV at 10 feet from a pavement breaker. Other typical construction activities and equipment, such as D-8 and D-9 Caterpillars, earthmovers, and trucks, have not exceeded 0.10 inch/second PPV at 10 feet. As a guide, major construction activity within 200 feet and pile driving within 600 feet may be potentially disruptive to sensitive operations (Caltrans 2002).

Pile driving for the VMT dock construction would not be located closer than 900 feet from the closest residential property line; no demolition or construction activity for VMT or Orcem would occur within 200 feet of an existing residential property line. Groundborne vibration levels from the operation of heavy construction equipment that would be used in demolition or construction of the proposed project would therefore not be expected to cause damage to residential buildings of normal northern California construction.

Given the location of the nearest sensitive receptors to the site, and the distance between them and the construction activity, it is unlikely that there would be any perceptible vibration off-site during construction activity. Therefore, vibration impacts during construction of the combined project components are considered **less than significant.**

Operational Impacts

As described above, during the operational phase of the combined VMT and Orcem project components, significant groundborne vibrations are not anticipated. In relation to truck trips on the local road network, there is potential for some groundborne vibrations to be generated by discontinuities in the road surface. However, since the road surface within the VMT Site and Orcem Site would be smooth and well-maintained, the potential for these vibrations would be substantially reduced. Since no significant groundborne vibration would be generated as a result of the combined VMT and Orcem operations, impacts would be **less than significant**.

C) Would the project create a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

VMT Analysis

As described under threshold A, Table 3.10-12 summarizes the significance determinations for the total VMT operational project-related noise level increases. Based on the information in Table 3.10-11, the following two locations would experience a significant permanent increase in the noise level as a result of VMT operations:

- NSL5 (Colt Court Residences)
- NSL10 (3rd Street Residence)

Therefore, the VMT project component would result in a **significant** impact (**Impact 3.10-4**) at these two locations, and mitigation is provided in Section 3.10.5.

Orcem Analysis

As described under threshold A, to assess the overall noise impact of the Orcem project component, the following three scenarios were assessed for both phases of operation:

A. Scenario A – noise impact of Orcem production and truck movements on the local road network. This represents the proposed normal operation of the Orcem facility when there is no vessel unloading or rail activity.

B. Scenario B – noise impact of Orcem production plus truck movements (including mitigation) plus the temporary noise impact of vessel unloading on the Orcem Site.

C. Scenario C – noise impact of Orcem production plus truck movements (including mitigation) plus the temporary noise impact of vessel unloading, plus the temporary noise impact of rail activity to the Orcem Site.

Table 3.10-22 summarizes the noise impacts under Scenario A and identifies those locations where a significant increase in the existing ambient noise level may occur. As shown in Table 3.10-22, the following locations would be exposed to a significant permanent increase in ambient noise levels under Scenario A:

- NSL2 (Seawitch Lane Residences)
- NSL3 (Harbor Park Apartments)
- NSL4 (Browning Way Residences)

Impacts at these locations would therefore be **significant** (**Impact 3.10-5**), and mitigation is provided in Section 3.10.5.

As described in greater detail under threshold A, no additional significant impacts would occur under Scenarios B and C.

Combined VMT and Orcem Analysis

The operational phases of both the VMT and Orcem project components have been assessed separately earlier in this section. In both instances, a series of mitigation measures (see Section 3.10.5) have been required to control the individual noise impact of each development. In order to assess the worst-case scenario for operational noise from the combined project components, the combined analysis includes noise generated by Orcem production and truck movements on the local road network, plus noise generated by VMT unloading a vessel and transporting material by truck, rail, and barge.

Table 3.10-28 presents the results of the combined VMT and Orcem noise generation levels at vicinity noise-sensitive receptors. The identified noise levels account for the mitigation measures already required separately for VMT and Orcem, as identified in Section 3.10.5. Table 3.10-29 summarizes the noise impacts of the combined project components and identifies those locations where a significant increase in the existing ambient noise level may occur.

At NSL2, NSL5, NSL7, and NSL9, there would be a very slight increase of less than 1 dBA above the allowable increase of 3 or 5 dBA; the actual exceedance is of the order of 0.5 dBA and due to rounding, a slight exceedance is identified. An exceedance of this magnitude is imperceptible, and it is considered impractical to provide mitigation for such a small amount. Increases in ambient noise levels from combined noise emissions from VMT and Orcem at all other locations assessed would be below the threshold of significance for a permanent and significant noise impact to occur. Therefore, combined VMT and Orcem noise increases at all locations assessed would be below the threshold of significance for a permanent and significant noise impact, resulting in a **less-than-significant** noise impact.

D) Would the project create a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

VMT Analysis

As described under threshold A, the following two types of short-term noise impacts would occur during VMT site preparation and construction:

- An increase in traffic volumes on local streets associated with the transport of workers, equipment, and materials to and from the project site.
- Heavy construction equipment operating on the project site.

The transport of workers and construction equipment and materials to the project site would incrementally increase noise levels on access roads leading to the site. Because workers and construction equipment would use existing routes, noise from slow-moving passing trucks (75 dBA L_{max} at 50 feet) would be similar to existing vehicle-generated noise. For this reason, short-term intermittent noise from trucks would be minor when averaged over a longer time period (i.e., an hour or more).

Table 3.10-6 (provided earlier) presents the predicted maximum noise levels at the nearest noise sensitive locations (i.e., NSL1, NSL2, and NSL3) for a range of expected construction activities. The closest noise-sensitive land uses to the VMT construction areas are NSL1, NSL2, and NSL3, which adjoin the project site. These properties are located between 360 and 1,427 feet from the construction activity reflected in Table 3.10-6. At these distances, maximum noise levels from construction activities at the building site could range from 47 dBA up to 75 dBA L_{max} at the property line of the nearest sensitive locations.

These levels represent a substantial temporary increase in ambient noise levels in the vicinity of the VMT construction areas. This is considered a **significant** short-term, temporary, noise impact (**Impact 3.10-6**). Please refer to Section 3.10.5 for mitigation to address this impact.

Orcem Analysis

As described under threshold A, above, construction of the Orcem project component would involve both indirect off-site noise impacts (increased traffic on local streets associated with the transport of workers, equipment, and materials to and from the project site) and noise from on-site equipment and activity.

The transport of workers and construction equipment and materials to the project site would incrementally increase noise levels on access roads leading to the Orcem Site. During the worst-case periods of construction, it is estimated that there would be up to five deliveries per day to the site using heavy trucks. Since workers and construction equipment would use existing routes, noise from slow-moving passing trucks (75 dBA L_{max} at 50 feet) would be similar to existing vehicle-generated noise in the project area. For this reason, short-term intermittent noise from trucks would be minor when averaged over a longer time period.

Existing receptors in the vicinity of the Orcem Site would be subject to short-term noise generated by construction equipment and activities on the project site when construction occurs. Table 3.10-13, above, presents the predicted maximum noise levels at the nearest noise sensitive locations (i.e., NSL1, NSL2, and NSL3) for a range of expected construction activities. The closest noise-sensitive land uses to the project construction areas are NSL1, NSL2, and NSL3, which adjoin the project site. These properties are located between 400 and 1,475 feet from the Orcem construction activity listed in Table 3.10-13. At these distances, maximum noise levels from construction activities at the building site could range from 45 dBA up to 75dBA L_{max} at the property line of the nearest sensitive locations.

These levels represent a substantial temporary increase in ambient noise levels in the vicinity of the project. This is considered a **significant** short-term, temporary, noise impact (**Impact 3.10-7**). Please refer to Section 3.10.5 for mitigation to address this impact.

Combined VMT and Orcem Analysis

As described under both the VMT and Orcem analyses, construction noise impacts would include indirect off-site noise associated with traffic trips for workers and materials, and on-site noise from equipment and construction activities. The transport of workers and construction equipment and materials to the project site would incrementally increase noise levels on access roads leading to the site. Because workers and construction equipment would use existing routes, noise from slow-moving passing trucks (75 dBA L_{max} at 50 feet) would be similar to existing vehicle-generated noise. For this reason, short-term intermittent noise from trucks would be minor when averaged over a longer time period.

Table 3.10-27 presents the predicted maximum noise levels at these nearest noise sensitive locations for a range of expected construction activities for both the VMT and Orcem project components. The major difference in construction between the two project components is the installation of pilings as part of the VMT component.

The closest noise-sensitive land uses to the project construction areas are NSL1, NSL2, and NSL3, which adjoin the project site. These properties are located between 360 and 1,427 feet from the construction activity reflected in Table 3.10-27. At these distances, maximum noise levels from construction activities at either building site could range from 45 dBA up to 75 dBA L_{max} at the property line of the nearest noise-sensitive locations. In a worst-case scenario, if the most noise-intensive construction activity were to occur simultaneously on both the VMT and Orcem Sites, maximum construction noise could range up to 78 dBA L_{max} at the property line of the nearest noise-sensitive locations (the sum of 75 dBA plus 75 dBA). This noise level would be just noticeable to an average resident, compared to the 75 dBA maximum noise level from either of the two project components alone. However, these levels would represent a substantial temporary increase in ambient noise levels in the vicinity of the project. This is considered a **significant** short-term, temporary, noise impact (**Impact 3.10-8**). Please refer to Section 3.10.5 for mitigation to address this impact.

3.10.5 Mitigation Measures

Mitigation for Impacts 3.10-1 and 3.10-4: VMT Rail transportation activity, including the movement of rail cars along facility and adjoining track and the loading of materials into rail cars, would generate a significant permanent increase in noise levels at two noise-sensitive receptor locations that would exceed established standards.

MM-3.10-1a VMT shall work with the California Northern Railroad to upgrade the existing track and any new track to a Continuous Welded Rail (CWR) which will remove the joints and provide a smooth continuous surface for rolling stock. Successful application of this measure would reduce the noise levels generated by rolling stock movements by 5 decibels (dB). The goal of this mitigation is to upgrade to CWR for all tracks as far as the junction with Chestnut Street to the north of the site. Figure 3.10-8 illustrates the extent of the CWR that is the goal under this mitigation.

MM-3.10-1b In order to mitigate excess noise generated by loading material into the rail and barge hoppers due to the impact of stone/gravel on the metal walls of the hopper, hoppers shall be lined with a rubber wearing sheet. Application of this measure would reduce hopper noise by 10 decibels (dB).

Mitigation for Impacts 3.10-2 and 3.10-5: The operation of the Orcem Plant, including all phases of materials handling and plant production, would generate a significant permanent increase in noise levels at three noise-sensitive receptor locations adjacent to the Orcem Site that would exceed established standards.

MM-3.10-2 In order to reduce the noise impact of the plant operation, a series of improvements are required for specific items in the plant as follows.

- An in-line attenuator shall be incorporated between the main fan (561-FN1) and the stack exhaust, offering minimum insertion losses as per Table 3.10-31.
- Local screening shall be provided adjacent to the clinker store bag filter fan (513-FN1) to reduce the noise level by 19 decibels (dB).
- Local screening shall be provided adjacent to the bag filter fan (521-FN1) to reduce the noise level by 18 dB.
- Local screening shall be provided adjacent to the air shock (531-AB1) to reduce the noise level by 9 dB.
- Local screening shall be provided adjacent to the main fan (561-FN1) to reduce the noise level by 9 dB.
- Local screening shall be provided adjacent to the bag filter fan on the intake Silo (521-FN2) to reduce the noise level by 8 dB.
- Local screening shall be provided adjacent to the air slide fans within the filter building (591-FA1, 591-FA2, 591-FA3) to reduce the noise level by 7 dB.
- Local screening shall be provided adjacent to the filter building bag filter fan (591-FN1) and the silo fan (591-FN3) to reduce the noise emission of each source by 3 dB.

Table 3.10-31
Orcem Plant Exhaust Stack Mitigation Requirements

Ref	Measured Static Insertion Loss Octave Band Center Frequency (Hz) dB							
	63	*125*	*250*	*500*	*1k*	*2k*	*4k*	*8k*
Stack Attenuator	11	13	15	17	19	20	20	20

Mitigation for Impact 3.10-3: The VMT project component would generate significant groundborne vibrations as a result of rail operations due to rolling stock on the existing jointed track.

Refer to mitigation measure **MM-3.10-1a**.

Mitigation for Impacts 3.10-6: The construction of the VMT facility would generate temporary noise levels up to 75 dBA L_{eq} at the closest residential receptor locations, resulting in potentially significant construction noise nuisance impacts.

MM-3.10-3a The following measures shall be adhered to during construction of the VMT facility.

- All construction equipment must have appropriate sound-muffling devices, which shall be properly maintained and used at all times such equipment is in operation.
- Where feasible, the project contractor shall place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the project site.
- The construction contractor shall locate on-site equipment staging areas so as to maximize the distance between construction-related noise sources and noise-sensitive receptors nearest the project site.
- Except as otherwise permitted, construction activities shall be restricted to the hours of 7:00 a.m. to 7:00 p.m. Monday to Saturday. Construction shall be prohibited on Sundays.
- Large pot-holes or rough pavement along Derr Avenue and Lemon Street within 0.50 mile of the plant shall be repaired in accordance with standards as determined necessary and feasible by the Vallejo Public Works Director to reduce roadway noise from construction vehicle and equipment transport.

MM-3.10-3b The following measures shall be implemented during construction of the VMT project component in order to lessen pile-driving noise impacts.

- Use a timber cushion block between the pile and hammer head to reduce impact noise.
- Correct alignment of pile and rig to reduce noise from pile guides and attachments.
- Use acoustic screens or efficient sound reducing exhausts to power units.

Mitigation for Impact 3.10-7: The construction of the Orcem Plant would generate temporary noise levels up to 75 dBA L_{eq} at the closest residential receptor locations, resulting in potentially significant construction noise nuisance impacts.

MM-3.10-4 The following measures shall be adhered to during construction of the Orcem facility.

- All construction equipment must have appropriate sound-muffling devices, which shall be properly maintained and used at all times such equipment is in operation.
- Where feasible, the project contractor shall place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the project site.
- The construction contractor shall locate on-site equipment staging areas so as to maximize the distance between construction-related noise sources and noise-sensitive receptors nearest the project site.
- Except as otherwise permitted, construction activities shall be restricted to the hours of 7:00 a.m. to 7:00 p.m. Monday to Saturday. Construction shall be prohibited on Sundays.
- The project applicant shall establish and maintain a hot-line for the duration of the construction period to receive and respond to noise complaints.

Mitigation for Impact 3.10-8: The combined effects of construction of the VMT and Orcem project components would result in a substantial temporary increase in ambient noise levels in the vicinity of the project site.

Refer to mitigation measures **MM 3.10-3a, MM-3.10-3b**, and **MM 3.10-4**.

3.10.6 Level of Significance After Mitigation

Impacts 3.10-1, 3.10-3, and 3.10-4: Implementation of mitigation measures MM-3.10-1a and MM-3.10-1b would reduce VMT's operational noise levels, as illustrated in Table 3.10-32. However, implementation of mitigation measure MM-3.10-1a would be dependent on the California Northern Railroad since the City does not have jurisdiction over the railroad. While the City can require the applicants to work with the California Northern Railroad to make these improvements, the City cannot ensure that the California Northern Railroad will agree to make the improvements. Therefore, Impacts 3.10-1 and 3.10-3 would remain **significant and unavoidable** with mitigation.

Table 3.10-32
Mitigated Noise Levels from All VMT Operations Activity (Combined)

Location	Phase	VMT Bulk Terminal dB L_{dn}	VMT Rail dB L_{dn}	VMT Trucks dB L_{dn}	VMT Total Noise dB L_{dn}	Existing Baseline Level dB L_{dn}	Total Noise Level dB L_{dn}	Increase in Noise Level, dB L_{dn}
NSL1	1	46	39	n/a	46	55	56	1
	2	46	39	n/a	47		56	1
NSL2	1	51	37	n/a	51	53	55	2
	2	51	37	n/a	51		55	2
NSL3	1	44	45	37	48	52	53	1
	2	46	45	37	49		54	2
NSL4	1	47	46	38	50	52	54	2
	2	49	46	38	51		55	3
NSL5	1	41	53	49	55	52	57	5
	2	44	53	49	55		57	5
NSL6	1	32	52	61	62	57	63	6
	2	36	52	61	62		63	6
NSL7	1	29	43	61	61	63	65	2
	2	31	43	61	61		65	2
NSL8	1	49	40	n/a	50	54	55	1
	2	51	40	n/a	51		56	2
NSL9	1	23	43	61	61	63	65	2
	2	26	43	61	61		65	2
NSL10	1	37	52	n/a	53	52	55	3
	2	40	52	n/a	53		55	3

Impacts 3.10-2 and 3.10-5: Implementation of mitigation measure MM-3.10-2 would reduce Orcem's operational noise impacts to a **less-than-significant** level.

Impact 3.10-6: Implementation of mitigation measures MM-3.10-3a and MM-3.10-3b would reduce VMT's construction noise impacts to a **less-than-significant** level.

Impact 3.10-7: Implementation of mitigation measure MM-3.10-4 would reduce Orcem's construction noise impacts to a **less-than-significant** level.

Impact 3.10-8: Implementation of mitigation measures MM-3.10-3a, MM-3.10.3b, and MM-3.10-4 would reduce the combined construction noise impacts to a **less-than-significant** level.

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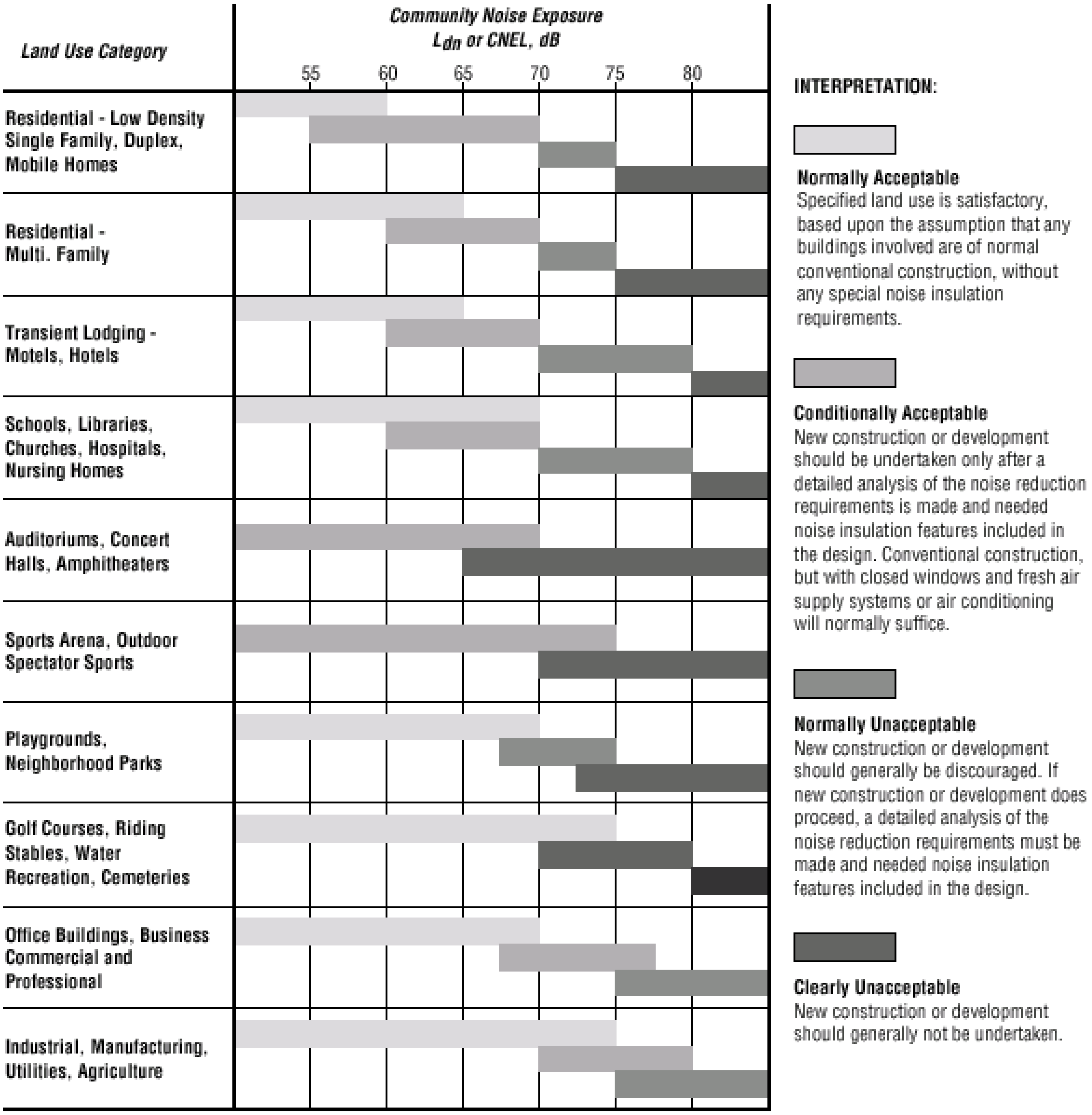

Normally Acceptable
Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

Conditionally Acceptable
New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

Normally Unacceptable
New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

Clearly Unacceptable
New construction or development should generally not be undertaken.

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FIGURE 3.10-1

Land Use Compatibility Guidelines (Community Noise)

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▭ Project Site

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SOURCE: AWN Consulting 2014

FIGURE 3.10-2

Noise Monitor Locations

VALLEJO MARINE TERMINAL AND ORCEM PROJECT DRAFT EIR

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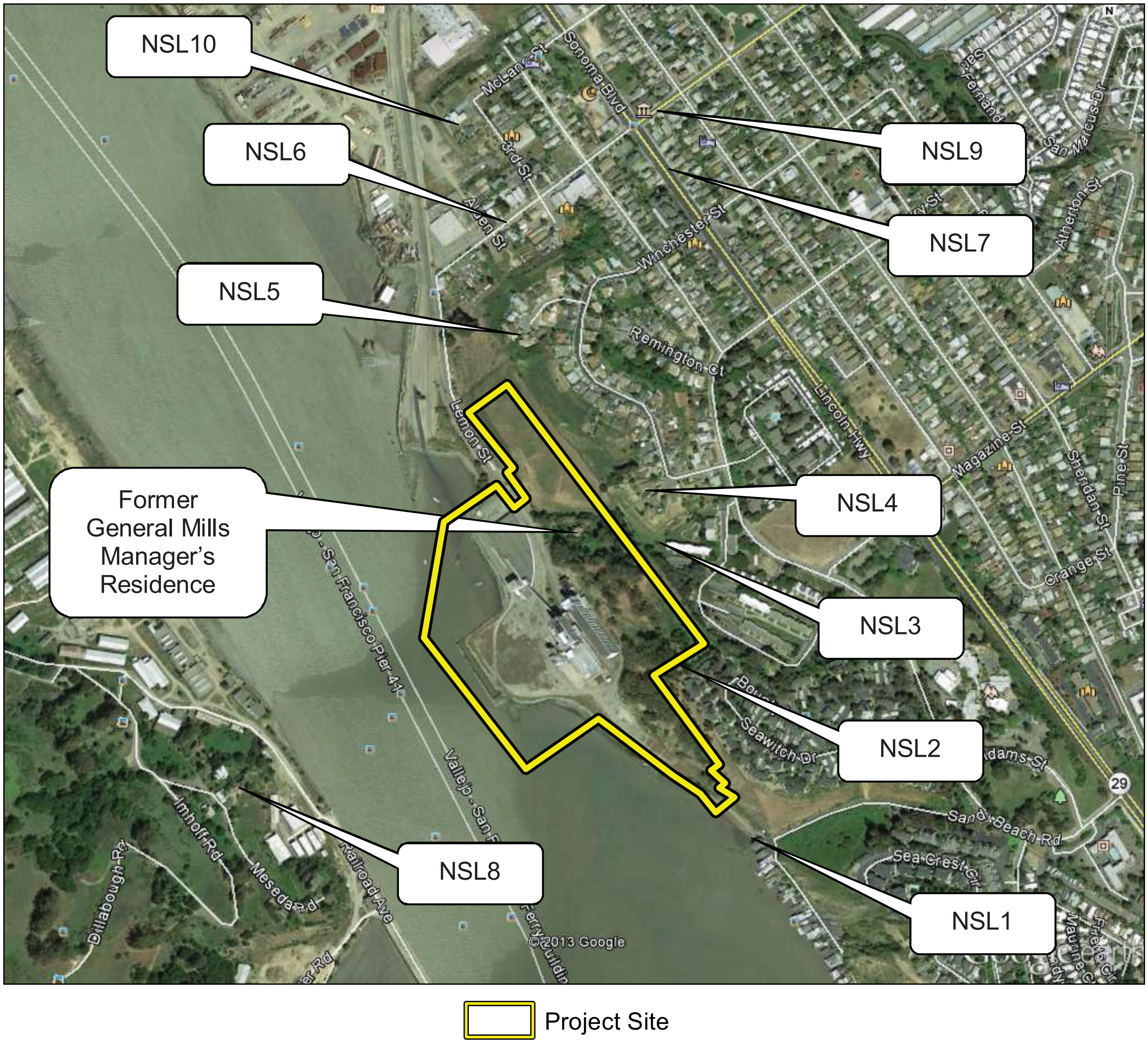

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SOURCE: AWN Consulting 2014

FIGURE 3.10-3

Noise Sensitive Land Use Locations in the Project Vicinity

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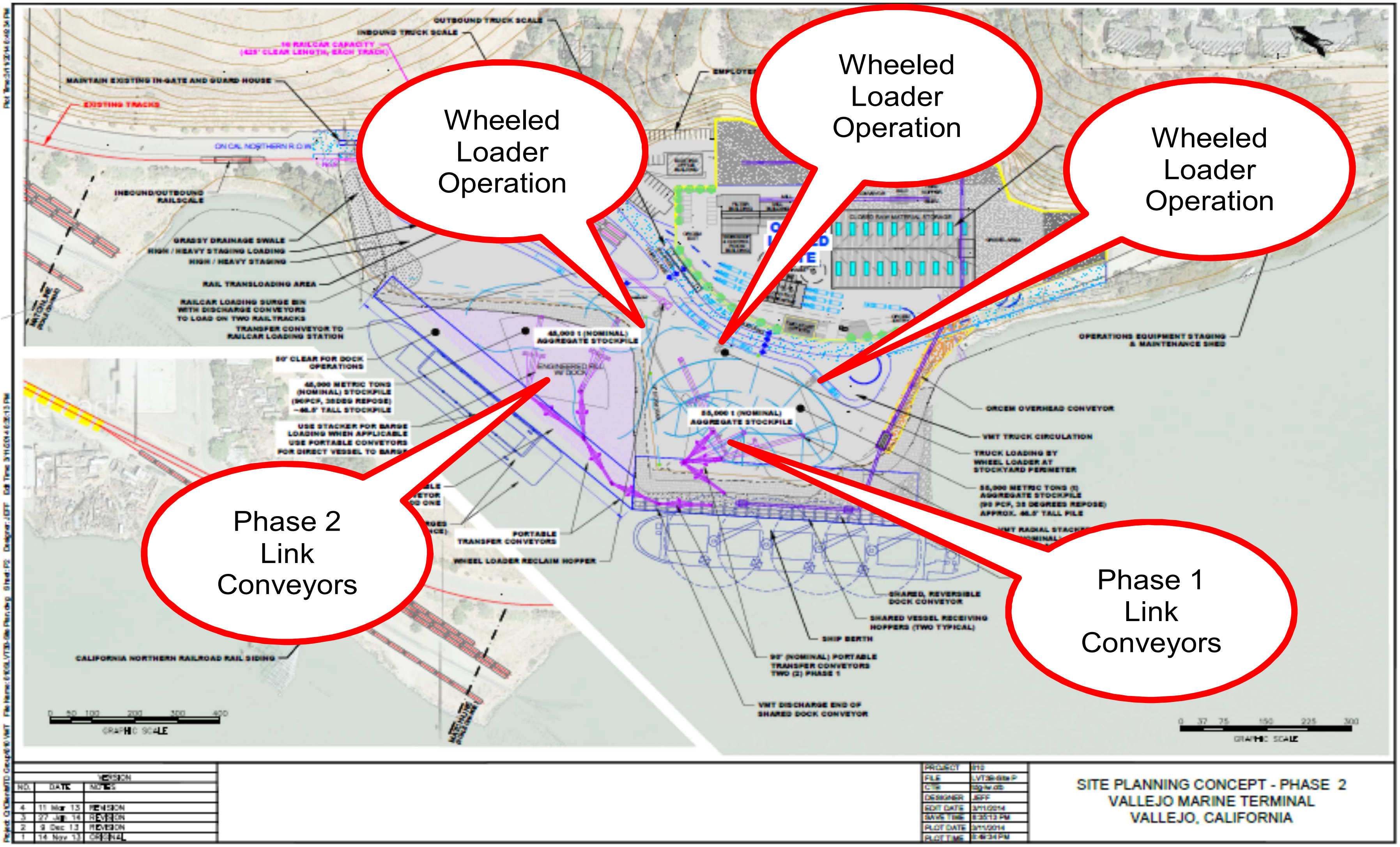

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SOURCE: AWN Consulting 2014

FIGURE 3.10-4

VMT Mobile Plant Operations Layout

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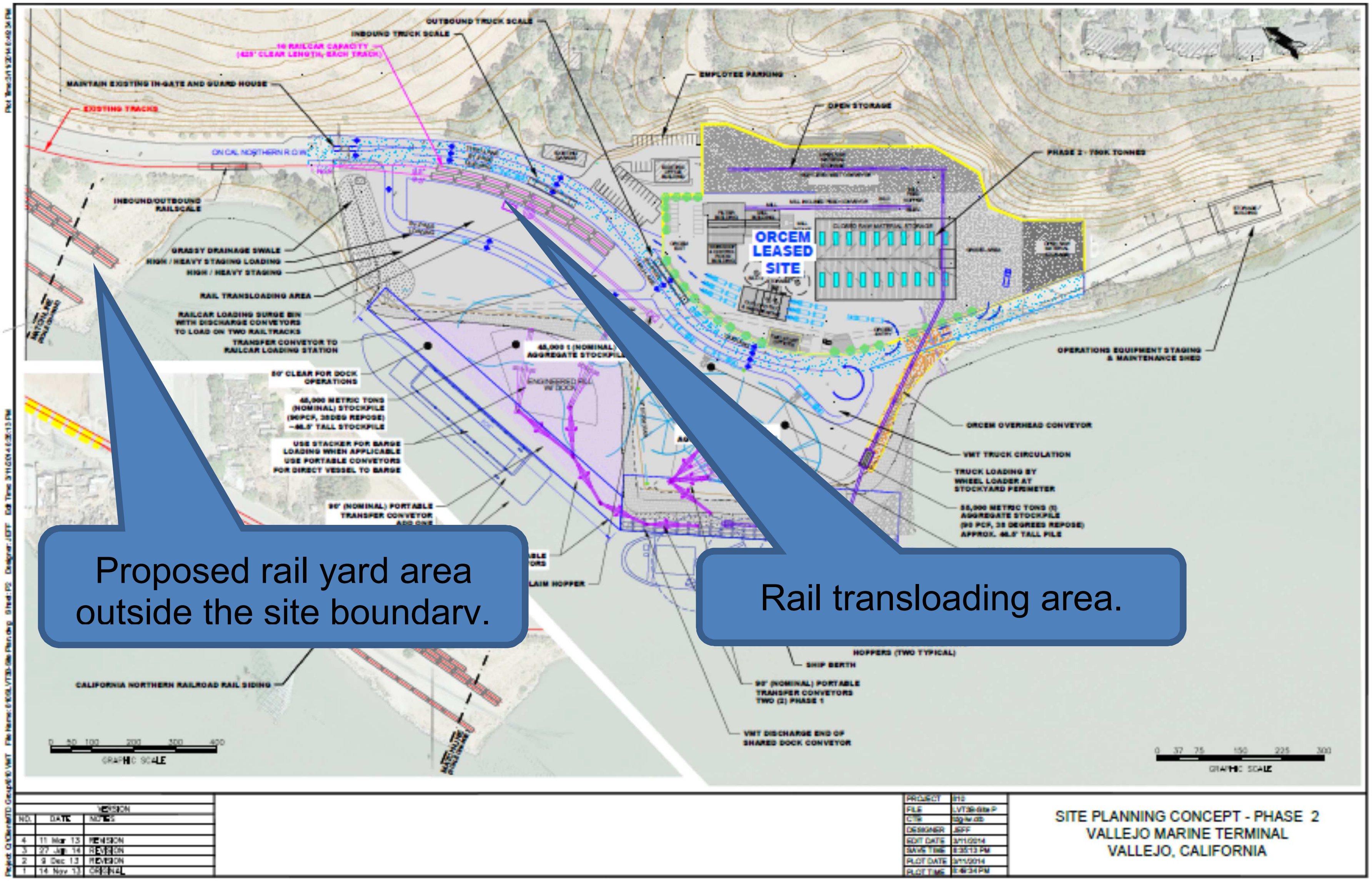

NO.	DATE	NOTES
4	11 Mar 13	REVISION
3	27 Jan 14	REVISION
2	9 Dec 13	REVISION
1	14 Nov 13	ORIGINAL

PROJECT	810
FILE	LVT36-Site P
CTB	
DESIGNER	JEFF
EDIT DATE	3/11/2014
SAVE TIME	8:35:13 PM
PLOT DATE	3/11/2014
PLOT TIME	8:49:34 PM

SOURCE: AWN Consulting 2014

FIGURE 3.10-5

VMT On-Site Rail Activity Areas

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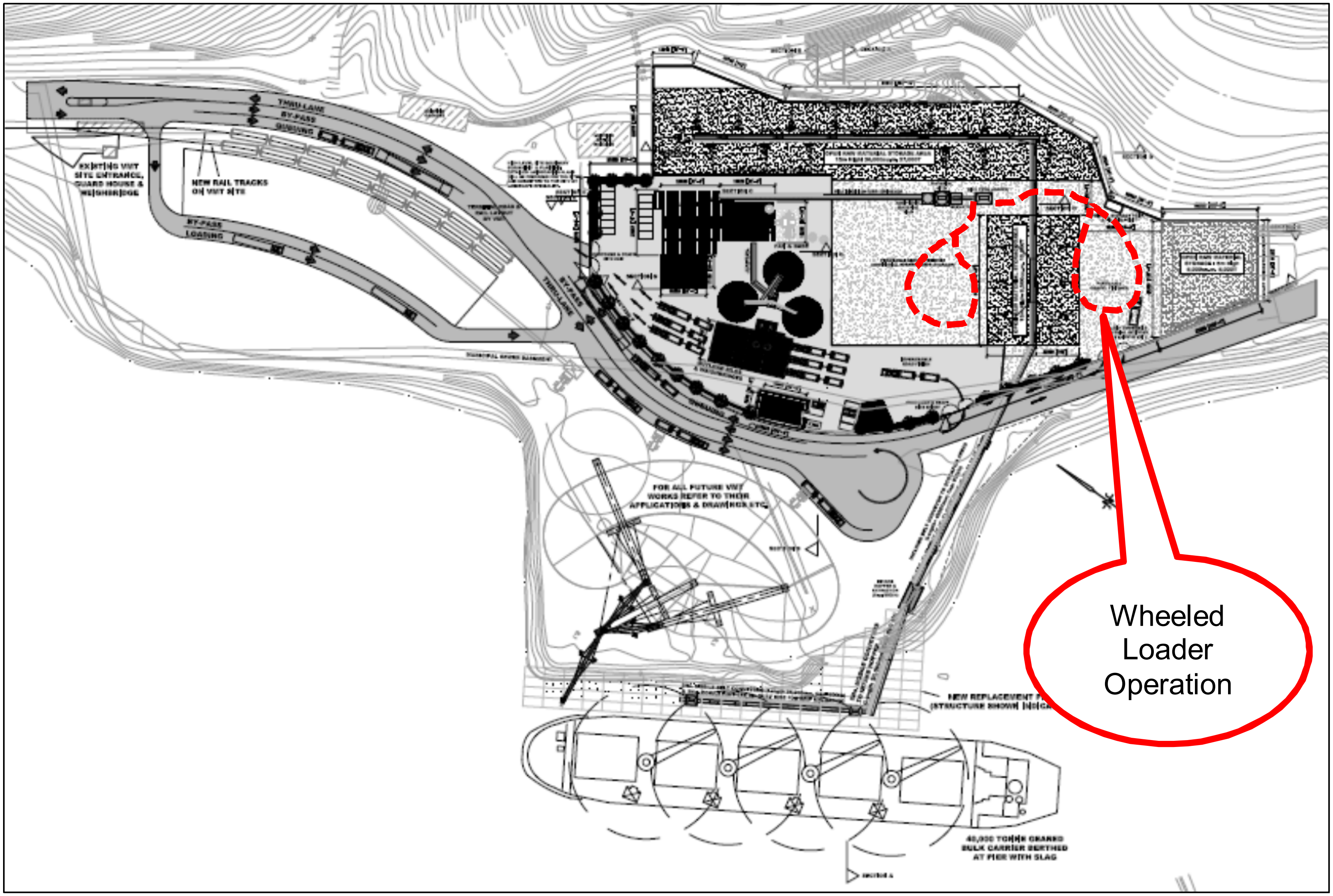

SOURCE: AWN Consulting 2014

FIGURE 3.10-6

Orcem Plant Wheeled Loader Operations Area

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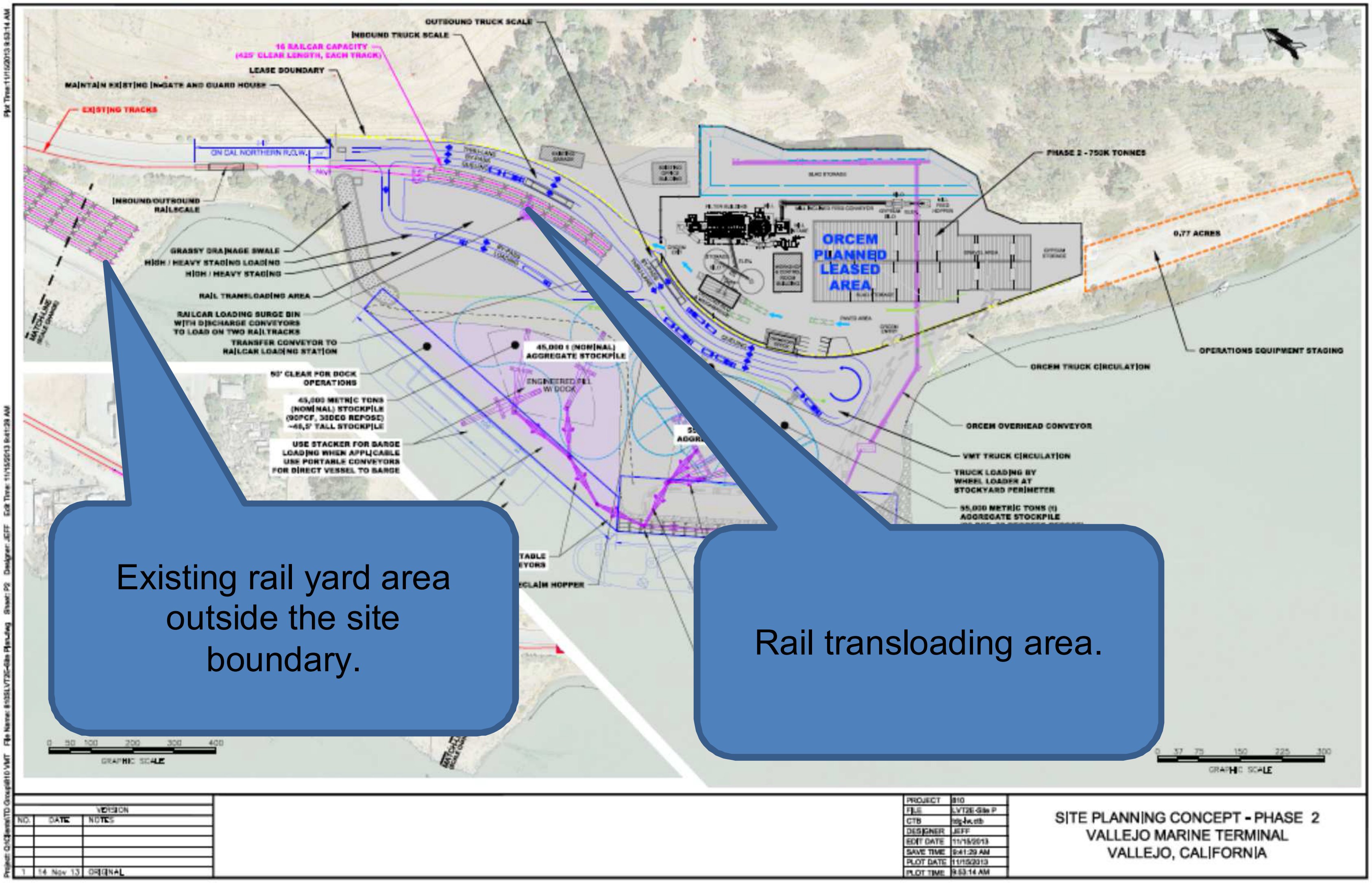

SOURCE: AWN Consulting 2014

FIGURE 3.10-7
Orcem On-Site Rail Activity Areas

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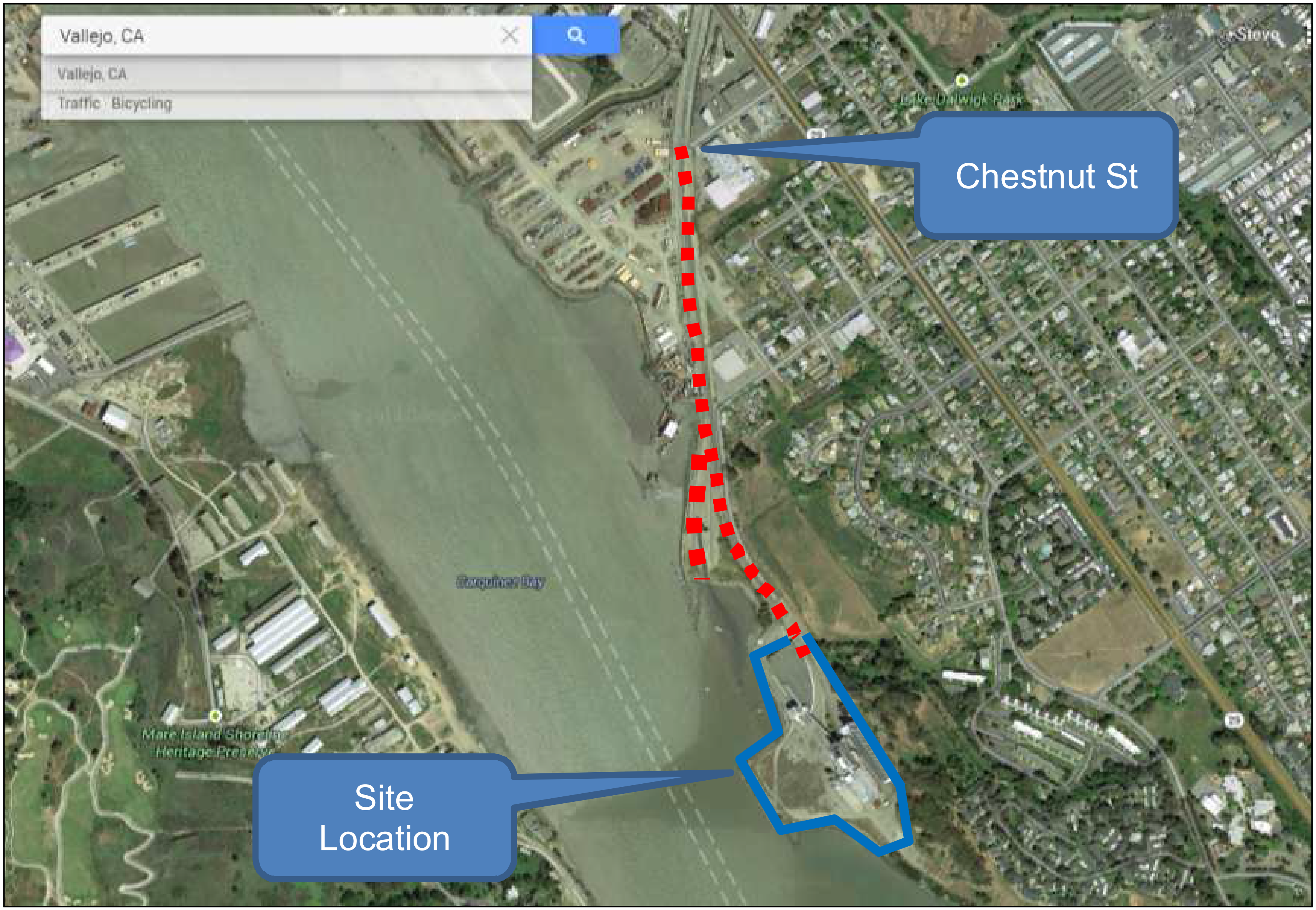

SOURCE: AWN Consulting 2014

FIGURE 3.10-8

Extent of Required Continuous Weld Rail (CWR) for Rail Activity Noise Mitigation

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3.11 PUBLIC SERVICES AND RECREATION

This section analyzes the potential impacts of the Vallejo Marine Terminal (VMT) and Orcem project (proposed project) with respect to public services and recreation and recommends mitigation measures where necessary to reduce or avoid significant impacts.

3.11.1 Regulatory Setting

Federal

Maritime Transportation Security Act of 2002

The Maritime Transportation Security Act of 2002 (MTSA) amends the Merchant Marine Act of 1936 to establish a program to ensure greater security for U.S. ports and waterways. The MTSA, which implements the International Ship and Port Facility Security Code, creates a consistent security program for all U.S. ports. The MTSA requires vessels and port facilities to conduct vulnerability assessments and develop security plans that address security patrols, restricted areas, personnel identification procedures, access control measures, and surveillance equipment.

Security and Accountability for Every Port Act of 2006

The Security and Accountability for Every (SAFE) Port Act of 2006 modified existing legislation and created and codified new programs related to maritime security. These programs to improve security of U.S. ports include creation of the Transportation Worker Identification Credential, interagency operational centers for port security, the Port Security Grant Program, the Container Security Initiative, foreign port assessments, and the Customs Trade Partnership Against Terrorism. The Department of Homeland Security and its U.S. Coast Guard, Transportation Security Agency, and U.S. Customs and Border Protection have key maritime security responsibilities.

State

California Code of Regulations Title 24, Part 2 and Part 9

Part 2 of Title 24 of the California Code of Regulations (CCR) refers to the California Building Code, which contains regulations and general construction building standards of state adopting agencies, including administrative, fire, and life safety and field inspection provisions. Part 2 was updated in 2008 to reflect changes in the base document from the Uniform Building Code to the International Building Code. Part 9 refers to the California Fire Code, which contains fire safety-related building standards referenced in other parts of Title 24. This code is preassembled with the 2000 Uniform Fire Code of the Western Fire Chiefs Association. This code was revised in January 2008 with a change in the base model/consensus code from the Uniform Fire Code series to the International Fire Code.

California Fire Code

The California Fire Code and Office of the State Fire Marshall provides regulations and guidance for local agencies in the development and enforcement of fire safety standards. The California Fire Code also establishes minimum requirements that would provide a reasonable degree of safety from fire, panic, and explosion.

Local

City of Vallejo General Plan

The Vallejo General Plan identifies the following goals and policies related to public services and recreation (City of Vallejo 1999).

Fire Hazards Goal: To protect life, property, and public well-being from seismic, floodplain, and other environmental hazards and to reduce or avoid adverse economic, social, and physical impacts caused by existing environmental conditions.

- *Policy 1:* Use the Vallejo Fire Department Master Plan in evaluating all planning proposals.
- *Policy 3:* Continue irrigated, fire resistant landscape policy in new development.

Parks and Open Space Goal: To have a park and open space system that is convenient and properly designed to serve the needs of all residents of the community.

- *Policy 1:* Park design should be compatible with the surrounding land uses, and should reflect the natural environment. All proposed parks and recreational open space should be evaluated by the appropriate agencies and groups (including Planning, Public Works, Police, Fire, GVRD [Greater Vallejo Recreation District], VSFCD [Vallejo Sanitation and Flood Control District], VCUSD [Vallejo City Unified School District], Environmental Health and affected neighborhood organizations) in terms of community need, proper location and orientation, and accessibility.
- *Policy 2:* Parks and recreational open space that will be dedicated should be consistent with the Master Plan adopted by GVRD.
- *Policy 3:* The design of parks should take into consideration the concept of defensible open space to protect the safety of park users and the surrounding land uses.
- *Policy 6:* Trails and rights-of-way linking recreational areas should be provided.

Greater Vallejo Recreation District Park and Recreation Master Plan

The Greater Vallejo Recreation District (GVRD) is an independent special service district that has been providing recreational and leisure services to the citizens of Vallejo since 1944. GVRD is independent and separate from the City of Vallejo; however, GVRD manages most City-owned recreational properties (GVRD 2014).

The GVRD Park and Recreation Master Plan evaluates existing park and recreation areas and provides recommendations for meeting existing and future park and recreation needs within GVRD. The master plan also establishes criteria and standards for park and recreation areas and recommends funding mechanisms for implementation of the plan (GVRD 2006).

San Francisco Bay Trail Plan

The San Francisco Bay Trail Plan (Bay Trail Plan) is administered by the Association of Bay Area Governments. The Bay Trail is a multi-purpose recreational trail that, when complete, would encircle San Francisco Bay and San Pablo Bay with a continuous 400-mile network of bicycling and hiking trails. The trail would connect the shoreline of all nine Bay Area counties, link 47 cities, and cross the major bridges in the region.

3.11.2 Existing Conditions

Fire and Emergency Services

The project site is served by the Vallejo Fire Department (VFD). The VFD service area includes 53.58 square miles of incorporated City Limits, and the East Vallejo Fire District. VFD also provides fire and medical service for the unincorporated areas in the City’s sphere of influence. The VFD consists of four divisions: the Emergency Medical Services Division, Fire Prevention Division, Fire Suppression Division, and Fire Training Division (City of Vallejo 2013a). There are six fire stations located throughout the City of Vallejo (City of Vallejo 2013b). Station 22, located at 700 Fifth Street, approximately 0.5 mile from the project site, is the station nearest the project site.

Police Services

The project site is served by the Vallejo Police Department (VPD). The site is also secured and patrolled by a private security company. The strategic goals of the VPD include the following (City of Vallejo 2013c):

- Deliver police services that satisfy customer needs.
- Develop, empower, and sustain a highly professional workforce.

- Employ management systems that improve organizational effectiveness.
- Promote awareness and understanding between the Police Department and the people it serves.
- Foster a quality culture throughout the organization.

The VPD is located approximately 1.5 miles from the project site at 111 Amador Street.

Recreation Facilities

GVRD currently operates: 20 neighborhood parks, 4 community parks, and 4 special purpose parks; an Olympic-size swimming pool; and 4 community centers. It also manages over 1,000 acres of public land within the City and some surrounding areas (GVRD 2014). The closest park to the project site is the 5-acre Carquinez Park, which is located approximately 0.5 mile southeast of the site, adjacent to Grace Patterson Elementary School. This park does not have a playground, lighting, or pathways, and is not heavily used except for dog walking (GVRD 2006).

3.11.3 Thresholds of Significance

The following criteria, included in Appendix G of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.), will be used to determine the significance of potential public services and recreation impacts. Impacts to public services and recreation would be significant if the proposed project would:

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 following public services:
    - Fire protection
    - Police protection

B) Include recreational facilities or require the construction or expansion of recreational facilities which might, have an adverse physical effect on the environment.

3.11.4 Impact Discussion

A) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services:

Fire protection?

VMT and Orcem Project Analysis

The proposed project could increase the demand for fire protection due to the nature of the proposed uses on the site, which include heavy manufacturing and industrial uses. However, the project site is equipped with an existing 8-inch to 10-inch diameter looped water main that serves the overall site, delivering raw water for fire protection purposes. This fire protection system would be upgraded with placement of approved fire hydrants, and permanently maintained in accordance with the VFD standards to provide sustained water volumes for fire suppression purposes within the project site. In addition, VFD has confirmed that they have adequate equipment and personnel to serve the proposed project, and the project would not increase response times or otherwise impact performance of VFD (Sproete, pers. comm. 2014). Therefore, no new or physically altered fire protection facilities would be required as a result of the project, and impacts would be **less than significant**.

Off-Site Improvements

The proposed project includes two off-site improvements (public access improvements and removal of existing deteriorated docks) that would take place at the City of Vallejo Municipal Marina located approximately 2 miles north of the project site. These improvements would not increase the demand for fire protection services. Therefore, **no impact** would occur as a result of the off-site improvements.

Police protection?

VMT and Orcem Project Analysis

The proposed project could increase the demand for police protection by increasing use of the site compared to existing conditions. The site is currently vacant and is secured by perimeter fencing to keep the public off the site. With implementation of the proposed project, the project site would continue to be secured, and there would be no public access permitted. Due to the nature of the planned operations on the site, including shipping, the site would be a Department of Homeland Security-controlled site. All workers, including rail engineers and truck drivers, would be required to have a Transportation Worker Identification Credential to access the site at all times. Perimeter site fencing would be repaired as necessary, as part of an overall effort to enhance site security consistent with Department of Homeland Security marine terminal security requirements. Given the high level of security required for the site and the restrictions on public access, a substantial increase in police service needs is not anticipated. However, the project could indirectly impact police response times should traffic be impeded by such operations. The potential traffic impacts resulting from the project are evaluated in Section 4.12 of this Environmental Impact Report (EIR). Despite the potential for a slight increase in response times as a result of the project, the VPD has confirmed that they have the personnel needed to adequately serve the project (O'Connell, pers. comm. 2014). Therefore, the project would not trigger the need for new or improved police facilities in order to serve the project, and impacts would be **less than significant**.

Off-Site Improvements

The proposed project includes two off-site improvements that would take place at the City of Vallejo Municipal Marina located approximately 2 miles north of the project site as described earlier. These improvements would not increase the demand for police protection services. Therefore, **no impact** would occur as a result of the off-site improvements.

B) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might, have an adverse physical effect on the environment?

VMT and Orcem Project Analysis

The Bay Conservation and Development Commission (BCDC) requires shoreline development projects, such as the proposed project, to provide public access to the bay. As described under Police Services above, the project site would not be open to public access due to Department of Homeland Security regulations pertaining to maritime facilities. BCDC allows projects that cannot permit public access for safety and security reasons to provide in-lieu public access in an off-site location. In order to meet this requirement, the applicants would install a new self-propelled personal watercraft launch ramp just north of the access ramp to K Dock at the south end of the marina (see the following Off-Site Improvements discussion). The environmental effects of the proposed launch ramp have been analyzed as part of the project throughout this EIR. Therefore, no additional adverse physical effects on the environment are anticipated, and impacts would be **less than significant**.

Off-Site Improvements

The proposed project includes two off-site improvements that would take place at the City of Vallejo Municipal Marina located approximately 2 miles north of the project site as described earlier. The off-site improvements have been analyzed as part of the project throughout this EIR, and no additional adverse physical effects would occur as a result of the improvement. Therefore, impacts would be **less than significant**.

3.11.5 Mitigation Measures

No mitigation is required.

3.11.6 Level of Significance After Mitigation

No mitigation measures are required; therefore, impacts would remain less than significant.

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3.12 TRANSPORTATION AND TRAFFIC

This section analyzes the potential impacts of the Vallejo Marine Terminal (VMT) project component and the Orcem project component (together the proposed project) with respect to transportation and traffic, and recommends mitigation measures where necessary to reduce or avoid significant impacts. The impacts of the two project components are identified separately, along with the combined impacts, for both Existing Plus Project and Cumulative (year 2040) conditions. All figures referenced in this section are provided at the end of the section. The transportation technical appendix (Appendix L) contains supporting data and calculations, including the traffic counts, intersection level of service (LOS) calculations, and freeway LOS calculations.

3.12.1 Regulatory Setting

State

Caltrans

The California Department of Transportation (Caltrans) owns and operates the state highway system, consisting of freeways and state routes within California. In the study area, Caltrans maintains control of Intestate 80 (I-80), Interstate 780 (I-780), and State Route 29 (SR-29), including the ramp terminal intersection at I-780/I-80/Curtola Parkway. Caltrans maintains Corridor System Management Plans that describe existing and projected future conditions on all state routes and freeways, and proposes performance strategies and improvements.

California Public Utilities Commission

The California Public Utilities Commission (CPUC) regulates privately owned transportation networks, including the railroad system. In the study area, CPUC regulates all rail crossings for safety, including the 16 at-grade crossings in the rail impact study area**.**

California Northern Railroad Company

The California Northern Railroad Company, a railroad company owned by Genessee & Wyoming, operates the railway connecting the project site to the larger railroad network.

Regional

San Francisco Bay Area Water Emergency Transportation Authority

The San Francisco Bay Area Water Emergency Transportation Authority owns and operates the San Francisco Bay Ferry service between the Vallejo Ferry Terminal and San Francisco.

Solano Transportation Authority

The Solano Transportation Authority (STA) was created in 1990 and has jurisdiction for Solano County to manage the county's federal, state, and regional transportation funds. In the role of Solano County's Congestion Management Agency, STA partners with the Metropolitan Transportation Commission and Caltrans District 4. STA provides countywide planning and program prioritization, funding, operating, and maintaining transportation programs and services.

STA maintains the County Congestion Management Program (CMP). The most recently published CMP update is the 2013 CMP. The CMP requires that the transportation system within the County be monitored biennially for compliance with LOS standards. Each jurisdiction is responsible for monitoring the LOS on segments or intersections within its jurisdiction. The LOS standard for the County CMP facilities has been set at LOS E for all roadways except for those already operating at LOS F when the first CMP was prepared (County of Solano 2013). The CMP transportation system includes all of the state routes in the County and other Routes of Regional Significance. A comprehensive list of these routes is available in the CMP. The CMP applies the LOS E threshold to roadway segments, not intersections. Therefore, for purposes of intersection analysis, the local jurisdiction's LOS threshold should be applied.

In addition to LOS, the CMP considers four other performance measures. These performance measures are travel times to and from work, ridership for intercity transit, bicycle and pedestrian movement, and multimodal split.

Local

City of Vallejo

General Plan

The 1999 Vallejo General Plan (City of Vallejo 1999) establishes the goals and policies guiding land use and development within the City's Planning Area. Land use, transportation systems, environmental concerns, and economic and equity goals are discussed with the General Plan. The General Plan also includes goals and policies for vehicles, pedestrian and bike systems, public transit, freight movement, and congestion management strategies. While the entire Circulation and Transportation Element of the General Plan is incorporated here by reference, the key policies related to the proposed project include the following:

Mobility Goal – Policy 6: Prior to approval of a particular land use, it should be analyzed to determine its impact on the existing circulation system

Traffic Safety Goal – Policy 1: Reduce excessive speeds and amount of traffic in residential neighborhoods through a variety of techniques, including narrowing of streets or intersections, landscaping, diversion of traffic, and closing of streets. Innovative approaches to street design shall be encouraged as an incentive for greater use of the Planned Development approach to land development and neighborhood design.

Compatibility with Adjoining Land Uses Goal – Policy 3: All truck traffic and regional bus service should be restricted to peripheral major streets and north-south, east-west arterial and collector streets having the least number of residences and schools. Only small trucks servicing the neighborhood centers should be allowed on other streets. Where possible, unloading facilities should be provided off alleys rather than streets.

Non-Motorized Transportation Goal 2 – Policy 2*:* Provide safe pedestrian crossing, e.g., signalized crosswalks and pedestrian overpasses, on major streets where day-to-day activities warrant them. Pedestrian walkways should be provided between residential neighborhoods and high use areas such as schools, parks, and commercial centers. The walkways should be safe for adjoining property owners and users.

The City of Vallejo is in the process of updating its General Plan. However, for the purposes of this Environmental Impact Report (EIR), the current 1999 General Plan is referenced, since the update will not be complete until 2016.

Traffic Impact Analysis/Study Guidelines

The City of Vallejo has prepared guidelines for traffic impact analyses (City of Vallejo n.d.). The guidelines include topics such as defining the study area, obtaining traffic counts, identifying the peak periods for analysis, defining analysis scenarios, discussion of on-site access and circulation, the intersection analysis method, forecasting traffic, assessment of traffic impact significance, mitigation approach, sight distance assessments, assessment of impacts on non-auto modes of travel, and assessment of the need for roadway upgrades.

3.12.2 Existing Conditions

Study Area

The traffic analysis study area includes I-80 from north of I-780 to south of Sonoma Boulevard; I-780 from east of I-80 to its terminus at Curtola Parkway; and the City of Vallejo roadways along the primary access routes between the freeways and the project site, including Curtola Parkway, Sonoma Boulevard, and Lemon Street. The area includes segments of freeway mainline and ramps, roadways, and intersections under the jurisdictions of the City of Vallejo and Caltrans. The study area was defined in consultation with transportation planning staff in the

City of Vallejo and based on an assessment of the peak hour project traffic volumes that would be added to the roadway network. The pedestrian, bicycle, and transit study area is the same as the traffic study area. The rail impact study area extends from the project site through Vallejo to the northern city limit, and includes 16 at-grade rail crossings.

Roadway Network

The following major roadways provide circulation within the study area (see Figure 3.12-1).

I-80 is an east–west freeway originating in the San Francisco Bay Area to the southwest, continuing east to Sacramento and points east. I-80 crosses Vallejo in a north–south orientation. In the project study area, I-80 provides three mixed-flow lanes in each direction and has a posted speed limit of 65 miles per hour (mph).

I-780 is an east–west freeway that connects I-680 just north of the Benicia-Martinez Bridge to the east to I-80 in Vallejo. The freeway terminates at I-80, connecting to Curtola Parkway at the Lemon Street intersection. I-780 passes through parts of unincorporated Solano County and heads southeast along the Benicia State Recreation Area. In Vallejo, I-780 consists of two mixed-flow lanes in each direction with posted speed limit of 65 mph.

Sonoma Boulevard (SR-29) is a major north–south corridor that runs through the western part of the City of Vallejo. In addition to serving as a primary commercial corridor for the City, Sonoma Boulevard provides access to I-80 to the south and SR-37 to the north. In the project vicinity, Sonoma Boulevard is a four-lane roadway with left-turn pockets at major intersections between I-80 and Curtola Parkway. The railroad tracks that serve the project site (currently not in use) cross Sonoma Boulevard between Curtola Parkway and I-80. Sonoma Boulevard is also a designated truck route, with trucks representing 3.75% of the total volume during the peak periods, based on the most recent traffic count data provided by the Caltrans District 4 Office of Highway Operations. Sonoma Boulevard has striped bicycle lanes from Maritime Academy Drive to about 650 feet west of Magazine Street.

Curtola Parkway is a four-lane arterial that extends west from the I-780 terminus just west of I-80, intersecting Lemon Street, Solano Way, and Sonoma Boulevard. At this point the roadway becomes Mare Island Way, continuing along the Mare Island Strait and connecting to SR-37.

Lemon Street is a minor arterial that connects Curtola Parkway and SR-29. It provides direct access to I-780 from the project site and other industrial properties along the City's waterfront with one lane in each direction and on-street parking. Lemon Street was designated as a truck route until December 2010. On December 14, 2010, the Vallejo City Council removed portions of Tennessee Street, Mare Island Way, Curtola Parkway, Lemon Street, Solano Avenue, Benicia Road, Sacramento Street, and Broadway as truck routes. This change was intended to limit the movement of large commercial trucks on Vallejo streets because limited funding was available to maintain the streets. However, trucks are allowed by City ordinance to use non-designated streets to access pick-up and delivery sites if the streets provide direct property access to the site in question or are on the most direct path to the site. Lemon Street is also designated as a signed bike route, although striped bike lanes are not provided.

Existing Intersection Operations

Study Intersections

Intersections usually form the critical components of the local roadway system capacity because of the delay introduced by traffic signals and stop signs. Therefore, the local roadway network traffic impact evaluation focuses on the operations of key intersections on the routes that would serve the proposed project traffic. The following 17 intersections were selected for study in this analysis, based on the estimated project trip generation, distribution, and assignment to the roadway network:

1. Sonoma Boulevard (SR-29)/Curtola Parkway
2. Sonoma Boulevard (SR-29)/Solano Avenue
3. Sonoma Boulevard (SR-29)/Lemon Street
4. Sonoma Boulevard (SR-29)/Winchester Street
5. Sonoma Boulevard (SR-29)/Cherry Street
6. Sonoma Boulevard (SR-29)/Magazine Street
7. Sonoma Boulevard (SR-29)/Sandy Beach Road
8. Sonoma Boulevard (SR-29)/Maritime Academy Drive
9. Lemon Street/Third Street
10. Lemon Street/Porter Street
11. Lemon Street/Grant Street
12. Lemon Street/5th Street
13. Lemon Street/Sheridan Street
14. Lemon Street/6th Street
15. Lemon Street/Union Street
16. Lemon Street/Carlson Street
17. Lemon Street/Curtola Parkway

The intersections are shown on Figure 3.12-1.

Intersection Peak Hour Traffic Volumes

Counts of peak period (7:00 a.m.–9:00 a.m. and 4:00 p.m.–6:00 p.m.) traffic, pedestrian, and bicycle volumes at the 17 study intersections were conducted in April 2014. The peak hour vehicle turning movement volumes, along with the intersection control type (signal or side-street stop-control) and lane configuration are presented in Figures 3.12-2A and 3.12-2B. The peak hours in the study area, based on the counts, are 8:00 to 9:00 a.m. and 4:30 to 5:30 p.m. Counts of pedestrian crossings and bicycle movements were also collected and are included in the count sheets in Appendix L. Pedestrian and bicycle activity is very low at most intersections, although moderate pedestrian activity was observed at Lemon Street/Carlson Street and Lemon Street/Curtola Parkway, related primarily to the Curtola Park and Ride facility.

Field observations were also conducted during the PM peak hour to validate the current congestion levels and the queuing conditions. Traffic signal timing and phasing information for signalized intersections were obtained from Caltrans and the City of Vallejo.

Intersection Levels of Service Methodology

The operational performance of a roadway network is commonly described with the term "level of service" (LOS). LOS is a qualitative description of operating conditions, ranging from LOS A (free-flow traffic conditions with little or no delay) to LOS F (oversaturated conditions where traffic flows exceed design capacity, resulting in long queues and delays). The LOS analysis methods outlined in the Highway Capacity Manual (HCM2010; Transportation Research Board 2010) were used in this study, consistent with the Vallejo Traffic Impact Analysis Guidelines. This methodology incorporates characteristics such as the signal timing plan, the effects of pedestrians on signal phase duration, traffic volume peaking characteristics, motorist behavioral characteristics, and others. The HCM2010 is considered the state-of-the-art methodology for assessing intersection operations and defining impacts, and allows for the accurate definition of mitigation measures, such as lengthening or adding turning lanes, modifying the signal phasing or timing, and other options. The Synchro Version 8 analysis program was used to perform the HCM analysis. The HCM analysis methods for signalized and unsignalized intersections are described below.

Signalized Intersection Methodology

Traffic operations at signalized intersections are evaluated using the LOS method described in Chapter 16 of the HCM2010. A signalized intersection's LOS is based on the weighted average control delay measured in seconds per vehicle. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration. Table 3.12-1 summarizes the relationship between the control delay and LOS for signalized intersections.

Table 3.12-1
Signalized Intersection LOS Criteria

Level of Service (LOS)	Description	Average Control Delay (seconds)
A	Operations with very low delay occurring with favorable traffic signal progression and/or short cycle lengths.	< 10
B	Operations with low delay occurring with good progression and/or short cycle lengths.	> 10 to 20
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	> 20 to 35
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	> 35 to 55
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	> 55 to 80
F	Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths.	> 80

Source: Transportation Research Board 2010.
Note: V/C = volume to capacity

Unsignalized Intersection Methodology

In Chapter 17 of the HCM2010, the LOS for unsignalized intersections (side-street or all-way stop-controlled intersections) is defined by the average control delay per vehicle (measured in seconds). The control delay incorporates delay associated with deceleration, acceleration, stopping, and moving up in the queue. For side-street stop-controlled intersections, delay is calculated for each stop-controlled movement and for the uncontrolled left turns, if any, from the main street. The delay and LOS for the intersection as a whole and for the worst movement are reported for side-street stop intersections. The intersection average delay is reported for all-way stop intersections (Transportation Research Board 2010). Table 3.12-2 summarizes the relationship between delay and LOS for unsignalized intersections. The delay ranges for unsignalized intersections are lower than for signalized intersections as drivers expect less delay at unsignalized intersections.

Table 3.12-2
Unsignalized Intersection LOS Criteria

Level of Service (LOS)	Description	Average Control Delay per Vehicle (seconds)
A	Little or no delays	< 10
B	Short traffic delays	> 10 to 15
C	Average traffic delays	> 15 to 25
D	Long traffic delays	> 25 to 35
E	Very long traffic delays	> 35 to 50
F	Extreme traffic delays with intersection capacity exceeded	> 50

Source: Transportation Research Board 2010.

Intersection Level of Service Standards

City of Vallejo

As described in the City of Vallejo Traffic Impact Analysis Guidelines, Vallejo strives to maintain a LOS standard of D for intersections (City of Vallejo n.d.) For purposes of project impact assessment, Table 3.12-3 shows the maximum acceptable increase in volume-to-capacity (v/c) ratio that is acceptable for intersections operating at LOS C, D, and E/F. The v/c is calculated as part of the HCM methodology described above. Increases in v/c ratio above these thresholds would constitute a significant impact. These standards are applied to signalized and all-way stop-controlled intersections, but not to side-street stop-controlled intersections, where the overall operation of the intersection is often good even when the stop-controlled movement experiences longer delays.

At side-street stop-controlled intersections, poor LOS—e.g., LOS E or F—for the stop-controlled movement is an indication that a traffic signal may be warranted, subject to further evaluation, including a check of the peak hour volume signal warrant per the California Manual of Uniform Traffic Control Devices (CA-MUTCD). This warrant compares the higher side-street (stop-controlled) volume against the primary (uncontrolled) street two-way volume, and determines whether a signal is warranted based on the combination of the two volumes. Additional evaluation in the form of an engineering and traffic study that checks all the CA-MUTCD warrants and considers intersection-specific conditions is typically performed before deciding whether to install a signal.

Table 3.12-3
Volume-to-Capacity (V/C) Thresholds for Project Impacts (Signalized Intersections)

LOS Without Project	Increase in V/C With Project
C	>0.04
D	>0.02
E or F	>0.01

Source: City of Vallejo n.d.

Caltrans

For Caltrans-controlled intersections (i.e., the intersections on SR-29 and the I-780/Curtola Parkway/Lemon Street intersection) the LOS standard is the LOS C/D boundary. However, in practice, Caltrans has historically designated LOS D, or the current/baseline operating condition, whichever is worse, to be acceptable in urban, high-volume settings.

Existing Intersection Levels of Service

Table 3.12-4 shows the existing weekday AM and PM peak hour service levels, based on the counts conducted in April 2014. All signalized intersections operate at LOS C or better; one signalized intersection, Lemon Street/Curtola Parkway, operates at a good LOS D (38 seconds of delay) in the PM peak hour. Of the side-street stop-controlled intersections, all but one have side-street service levels of C or better; at the Lemon Street/Carlson Street intersection, which provides the entrance to the Curtola Park and Ride lot opposite Carlson Street, the park and ride lot driveway operates at LOS E in the PM peak hour. It is noted that a traffic signal is scheduled to be installed at this intersection in 2015, as part of the Curtola Park and Ride Hub improvement project that is currently under construction. With the signal installed, the side-street LOS E condition will be eliminated, and the intersection would operate at LOS A.

Table 3.12-4
Existing Peak Hour Intersection LOS

Intersection	Control[1]	Peak Hour	Existing Delay (LOS)[2]
1. Sonoma Boulevard/Curtola Parkway[3]	Signal	AM PM	19 (B) 23 (C)
2. Sonoma Boulevard/Solano Avenue	Signal	AM PM	8 (A) 10 (A)
3. Sonoma Boulevard/Lemon Street	Signal	AM PM	8 (A) 6 (A)
4. Sonoma Boulevard/Winchester Street	SSSC	AM PM	1 (A) [14 (B)] 1 (A) [15 (B)]
5. Sonoma Boulevard/Cherry Street	SSSC	AM PM	1 (A) [14 (B)] 1 (A) [15 (B)]

Table 3.12-4
Existing Peak Hour Intersection LOS

Intersection	Control[1]	Peak Hour	Existing Delay (LOS)[2]
6. Sonoma Boulevard/Magazine Street	Signal	AM PM	16 (B) 11 (B)
7. Sonoma Boulevard/Sandy Beach Road	SSSC	AM PM	4 (A) [16 (C)] 2 (A) [14 (B)]
8. Sonoma Boulevard/Maritime Academy Drive	Signal	AM PM	8 (A) 8 (A)
9. Lemon Street/Third Street	SSSC	AM PM	2 (A) [9 (A)] 2 (A) [9 (A)]
10. Lemon Street/Porter Street	SSSC	AM PM	4 (A) [9 (A)] 3 (A) [9 (A)]
11. Lemon Street/Grant Street	SSSC	AM PM	2 (A) [10 (A)] 1 (A) [10 (A)]
12. Lemon Street/Fifth Street (Lincoln Highway)	SSSC	AM PM	4 (A) [11 (B)] 5 (A) [13 (B)]
13. Lemon Street/Sheridan Street	SSSC	AM PM	2 (A) [10 (A)] 1 (A) [10 (A)]
14. Sixth Street/Lemon Street	SSSC	AM PM	1 (A) [11 (B)] 1 (A) [10 (A)]
15. Union Avenue/Lemon Street	SSSC	AM PM	1 (A) [10 (A)] 1 (A) [11 (B)]
16. Lemon Street/Carlson Street	SSSC	AM PM	4 (A) [16 (C)] 10 (A) [36 (E)]
17. Lemon Street/Curtola Parkway	Signal	AM PM	22 (C) 38 (D)

Source: See Appendix L.

Notes:

[1] Signal = signalized intersection, SSSC = side-street stop-controlled intersection.

[2] Traffic operations results include delay in seconds per vehicle and LOS grade A – F, based on delay thresholds published in the HCM (Transportation Research Board 2010). For side-street stop-controlled intersections, average delay is listed first followed by the delay for the worst approach in parentheses.

[3] HCM 2000 methodology is used for this intersection, because the five-leg configuration is not handled well in the HCM 2010/Synchro 8 software.

Existing Local Roadway Daily Traffic Volumes on Lemon Street

Lemon Street connects with Derr Avenue, providing the only means of vehicular access to the project site. Lemon Street is designated as an arterial roadway in the City's General Plan roadway network. As discussed in Section 3.12.2, while not currently officially designated as a truck route, Lemon Street provides a direct east–west connection between the project site and I-780. Lemon Street crosses Sonoma Boulevard, a designated north–south arterial roadway, approximately 0.50 mile northeast of the project site. Because all of the project traffic would use Lemon Street between the project site and Sonoma Boulevard, and just over half of the project traffic is expected to use Lemon Street between Sonoma Boulevard and Curtola Parkway, 24-hour traffic counts were taken at two locations on Lemon Street in order to provide a basis for assessing the neighborhood traffic impact along this roadway. The counts, conducted in April 2014, indicate a volume of 856 daily vehicles on Lemon Street just west of Sonoma Boulevard, and a volume of 9,437 vehicles just west of Curtola Parkway. The volume on Lemon Street just east of Sonoma Boulevard was not included in the 24-hour count, but based on the peak hour volume at the intersection of Lemon Street/Sonoma Boulevard, the daily volume is estimated to be about 2,700 vehicles per day (see Appendix L). The volumes just west and east of Sonoma Boulevard are consistent with a local roadway or very-low-volume collector; the volume just west of Curtola Parkway is consistent with a two-lane collector operating at the LOS C/D threshold.

Existing Freeway Operations

Freeway Operations Analysis Methodology

Freeway operations were analyzed for the following freeway segments:

- I-80 south of Sonoma Boulevard, at the southbound on-ramp and northbound off-ramp
- I-80 north of I-780, at the northbound on-ramp and southbound off-ramp
- Interstate 780 at the I-80/Curtola Parkway interchange

The analysis is based on the merge, diverge, and basic segment analysis procedures described in the HCM2010 (Transportation Research Board 2010), where LOS is related to vehicle density, as shown in Table 3.12-5. The vehicle density reflects both the congestion and average travel speed experienced by motorists. The densities are calculated in passenger car equivalents (PCEs) per hour per lane; PCEs take into account the truck composition of the traffic flow.

Table 3.12-5
Freeway LOS Definitions

Level of Service (LOS)	Freeway Segment Density (cars per hour/per lane)	Ramp Merge-Diverge Density (cars per hour/per lane)
A	< 11	< 10
B	> 11 and < 18	> 10 and < 20
C	> 18 and < 26	> 20 and < 28
D	> 26 and < 35	> 28 and < 35
E	> 35 and < 45	> 35
F	< 45 (Demand exceeds capacity)	Demand exceeds capacity when queues begin to form.

Source: Caltrans 2002.

Per Caltrans' requirements, the LOS for freeway weaving sections was determined using the Leisch Method as outlined in Figure 504.7A of the *Highway Design Manual* (Caltrans 2012).

The Leisch Method calculates the LOS based on the service flow (passenger cars/per hour/per lane) through the weaving section.

Existing Freeway Operations

Table 3.12-6 presents the current freeway operating conditions in the study area based on the latest available peak hour volumes obtained from the Caltrans Highway Operations department. All but one segment operates at LOS D or better; the I-780 westbound weave section at the I-780 loop ramps is operating at LOS F in the AM and PM peak hours.

Table 3.12-6
Existing Freeway Operations

Freeway Facility		Type	AM Peak Hour (LOS)	PM Peak Hour (LOS)
Interstate 780: Laurel St - Glen Cove Pkwy	EB	Basic	C/20.4	C/18.8
	WB	Basic	B/16.2	C/23.9
Interstate 780: I-80 Loop Ramps Weave	EB	Weave	A	A
	WB	Weave	**F/In Queue**	**F/In Queue**
Interstate 80: I-780 Connectors - Georgia St	EB	Basic	C/24.7	C/22.9
	WB	Basic	C/23.7	D/28.3
Interstate 80: I-780 Connector Ramps	EB	Merge	D/31.4	D/30.1
	WB	Diverge	D/32.4	D/36.9
Interstate 80: South of Sonoma Blvd	EB	Basic	A/10.0	C/18.2
	WB	Basic	C/21.6	B/12.1

Source: See Appendix L.
Notes: LOS = Level of service; WB = Westbound; EB = Eastbound.
Bold indicates segments operating below the Caltrans LOS standard of D.

Bicycle and Pedestrian Facilities

The study area roadway network includes the following facilities for pedestrian and bicycle circulation.

Bicycle Facilities

Bicycle lanes are provided on Sonoma Boulevard between Sequoia Avenue and just south of Cherry Street. No other bicycle lanes or signed bicycle routes exist on Sonoma Boulevard, Lemon Street or Curtola Parkway, within the study area. As noted above, bicycling activity is very light in the study area, based on the April 2014 counts.

Pedestrian Facilities

Sidewalks are generally provided along Sonoma Boulevard in the study area, although a sidewalk gap exists on the east side of the street from about 250 feet south of Cherry Street to the Magazine Street intersection, and south of Magazine Street, sidewalks are generally not present.

On Lemon Street, sidewalks are also generally provided, although in several locations the sidewalk traverses large industrial driveways, and at one key location – the east side of the street just south of Curtola Parkway – there is no sidewalk.

Protected (signalized) crossings are provided at five intersections along Sonoma Boulevard within the study area, including at Sonoma Boulevard/Lemon Street, which would serve all project trips. The intersection of Lemon Street/Curtola Parkway also provides signal-controlled crossings. There are striped crosswalks at several other side-street stop-controlled intersections along Sonoma Boulevard and Lemon Street.

The railroad tracks cross Sonoma Boulevard between Solano Avenue and Chestnut Street. While the tracks are not currently in use, the tracks would present an obstacle to pedestrian mobility once in use.

Transit Service

Local bus service in the study area includes SolTrans Route 3, which runs clockwise connecting the Vallejo Transit Center with the Glen Cove/Beverly Hills area via Curtola Parkway, returning via Magazine Street to serve the California Maritime Academy and Sonoma Boulevard stops before returning to the Transit Center. The service runs from approximately 6:00 a.m. and 7:30 p.m.. Headways on Route 3 are generally 30 minutes during the commute peak hours and hourly during the mid-day. Via its connection to the Vallejo Transit Center and the Curtola Park and Ride Hub, this route connects to other local and regional bus routes, including Route 80, connecting to El Cerrito Del Norte BART station; Route 78, connecting to Walnut Creek BART; and Route 85, connecting to the Fairfield Transportation Center (SolTrans 2014).

Railroad Network and Operations

The railroad tracks serving Vallejo are designated on the City's General Plan as "Railroad" corridors, enter the city limits from the north, and are owned and operated by the California Northern Railroad. These tracks enter Vallejo at the Napa/Solano county line, just east of SR-29 and Broadway Street. The tracks run parallel to Broadway Street for 1.7 miles, cross under SR-37, and then split just before Sereno Drive. From this junction, one set of tracks runs west and crosses the Mare Island Strait on the Mare Island Causeway. This segment of railroad is owned by the City of Vallejo and is currently leased to San Francisco Bay Railroad. The remaining California Northern tracks continue south, slowly separating from Broadway Street to the waterfront area on the east side of the Mare Island Strait near the project site. The areas traversed by this track designated on the Vallejo General Plan as Residential, Commercial and Employment (industrial) north of Curtola Parkway, and Employment south of Curtola Parkway. The distance from the junction to the end of the line is 3.3 miles.

The tracks serving Mare Island serve limited train traffic. However, the tracks between the Sereno junction and the project site have been inactive for many years. According to California Northern Railroad staff, the signal system would need to be upgraded to allow these tracks to serve train traffic (CNRR, pers. comm. 2014). At several crossings, missing or damaged equipment would need to be replaced, and all of the crossings would need to be improved to be compliant with the CPUC standards of the California Public Utilities Code (General Order Number 75-D), and the at-grade rail crossing design requirements set forth in the California Manual on Uniform Traffic Control Devices, Chapter 8 (Traffic Control for Railroad and Light Rail Transit Grade Crossings).

Table 3.12-7 summarizes the roadways that have grade crossings by the tracks to be used by the project. The current PM peak hour volumes are listed, along with the estimated vehicle queue storage length that is available between the stop bar for the signal control gates and the nearest upstream intersection.

Table 3.12-7
Existing Grade Crossings

Crossing	Street Type	# Lanes	PM Peak Hour Roadway Volume[1]	Distance to Nearest Upstream Controlled Intersection		Vehicle Queue Storage	
				West	*East*	*West*	*East*
Sonoma Boulevard (SR-29)	Arterial	4	1,080	410	240	30	20
Fifth Street	Collector	2	212	300	610	10	20
Curtola Parkway	Arterial	4	1,730	160	3500	10	280
Solano Avenue	Collector	2	434	240	760	10	30
Maine Street	Local	4	308	300	500	20	40
Georgia Street	Collector	4	740	430	340	30	30
Florida Street	Collector	4	858	390	350	30	30
Louisiana Street	Local	2	76	190	210	10	10
Tennessee Street	Arterial	4	1,720	20	340	2	30
Nebraska Street	Arterial	2	590	360	1000	10	40
Valle Vista Avenue	Collector	2	260	20	160	1	10
Redwood Street	Arterial	4	1,971	0	150	0	10
Sereno Drive	Collector	4	1,110	390	120	30	10
Tuolumne Street*	Local*	4	705	350	0	30	0
Lewis Brown Drive*	Arterial	4	3,800	250	390	20	30
Mini Drive	Collector	4	417	20	80	2	10
American Canyon Road (City of American Canyon)*	Collector	4	2,000	60	520	5	40

Notes:

[1] Volumes as counted in May 2014 (10% of daily volume), except where noted with asterisk.
Asterisk volumes:
Tuolumne Street taken from City of Vallejo 2008 count map.
Lewis Brown Drive estimated at similar to Sereno Drive.
American Canyon Road taken from *The Village at Vintage Ranch Traffic Impact Analysis*, December 15, 2013.

To the north of American Canyon Road in the City of American Canyon, the tracks cross Holcomb Lane, Donaldson Way East, and South Napa Junction Road in the City of American Canyon, and Watson Way in Napa County, before continuing northeast through Napa toward Fairfield.

Several of the crossings in Table 3.12-7 are of major roadways with intersections located very close to the tracks, including Tennessee Street, Valle Vista Avenue, Redwood Street, Mini Drive, and American Canyon Road in American Canyon. In addition, it is noted that the Nebraska Street grade crossing is located near the Vallejo High School and Vallejo Ninth Grade Academy, and thus may serve a substantial school-related pedestrian crossing volume, as well as school vehicle traffic around school bell times.

In addition to the roadway/rail grade crossings listed in Table 3.12-7, there are several other roadways that terminate near the tracks without complete barriers, such that pedestrians and potentially bicyclists may cross even if a designated crossing facility (sidewalk or bicycle route) is not provided. These locations include the following:

- Lemon Street
- Chestnut Street
- York Street
- Garford Alley
- Indian Alley
- Virginia Street
- Capitol Street
- Maxwell Alley
- Kentucky Street
- Springs Road
- Ohio Street
- Packard Alley
- Alabama Street
- Reo Alley
- Indiana Street
- Byron Street
- Illinois Street/Monterey Street
- Nevada Street/Alameda Street
- Hobbs Avenue/Almond Avenue
- Holly Street/Almond Avenue
- Willow Street/Almond Avenue

3.12.3 Thresholds of Significance

Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.) provides the guidance for determining the significance of potential transportation and traffic impacts. These guidelines are presented below, along with the specific criteria used in this EIR based on the standards of the City of Vallejo, the Solano County Congestion Management Agency (for CMP facilities), and Caltrans (for Caltrans facilities).

Impacts to transportation and traffic would be significant if the proposed project would:

A) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit.

   For the purposes of this impact evaluation, an impact would be significant if any of the following occur:

   1. The project causes the v/c ratio, as calculated with the HCM methodology, to increase by 0.04 or more at a signalized intersection operating at LOS C without the project; by 0.02 or more at a signalized intersection operating at LOS D without the project; or by 0.01 or more at a signalized intersection operating at LOS E or F without the project.
   2. The project causes a side-street stop-controlled intersection operating at LOS D or better (for the worst side street movement or approach) without the project to deteriorate to LOS E or F, and causes the California Manual on Uniform Traffic Control Devices peak hour signal warrant to be met for either peak hour.
   3. The project causes a side-street stop-controlled intersection already operating at LOS E or F without the project to deteriorate further and causes the California Manual on Uniform Traffic Control Devices peak hour signal warrant to be met for either peak hour.
   4. The project causes delays or queues at rail crossings that are substantial (delays of over 1 minute during peak hours, or queues that block upstream intersections during the day and early evening when traffic volumes are at or near their peak hour levels) relative to delays or queues without the project.
   5. The project causes a freeway segment to deteriorate from LOS D or better to LOS E or F.
   6. The project adds more than 50 peak hour vehicles to a freeway segment already operating at LOS E or F without the project.

B) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways.

For the purposes of this impact evaluation, an impact would be significant if either of the following occur:

1. The project causes a CMP-monitored intersection to fall below the CMP standard. This applies to the intersection of Sonoma Boulevard/Curtola Parkway, where the CMP LOS standard is E.
2. The project causes a CMP route segment to fall below the CMP standard. The CMP standard for I-80 in Vallejo is LOS F; the CMP standard for SR-29 and I-780 in Vallejo is LOS E.

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

For the purposes of this impact evaluation, an impact would be significant if the project site access design does not provide adequate sight distance and does not conform to City street design standards; or if the added trucks or trains would result in unsafe vehicle, pedestrian, and bicycle movements without physical improvements to improve safety.

D) Result in inadequate emergency access.

For the purposes of this impact evaluation, an impact would be significant if a significant impact is identified based on Criteria A.4 listed above.

E) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

For the purposes of this impact evaluation, based on guidance provided in the Vallejo General Plan (1999), an impact would be significant if either of the following occur:

1. The project prevents planned transit, pedestrian, or bicycle improvements from being constructed.
2. The project's added auto and truck trips or train movements obstruct, or make unsafe or substantially less convenient, pedestrian or bicycle movements on the City's roadway network.

3.12.4 Impact Discussion

This section presents the impact evaluation under each of the criteria in section 3.12.3. For each impact topic area A through E, the discussion addresses the impacts of the VMT project component, the Orcem project component, and the combined project as a whole.

A) Would the project conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and

relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit.

VMT and Orcem Project Analysis

Construction Impacts

During the construction period for Phase 1 and Phase 2 of the VMT project component and construction of the Orcem project component, temporary and intermittent transportation impacts may result from truck movements as well as construction worker vehicles to and from the project site. The construction-related traffic may temporarily reduce capacities of roadways in the project vicinity because of the slower movements and larger turning radii of construction trucks compared to passenger vehicles. It is expected that trucks accessing the site would use primarily the Curtola Parkway–Lemon Street route for trips to/from I-780 and I-80 East, and the Sonoma Boulevard route for trips to/from I-80 West. Truck traffic that occurs during the peak commute hours (7:00 a.m.to 9:00 a.m. and 4:00 p.m. to 6:00 p.m.) may result in worse LOS and higher delays at study intersections during the construction period, relative to existing conditions. The added truck traffic could also result in temporary closure of sidewalks, prohibition of on-street parking, and/or impact the stop locations of SolTrans Route 3 bus along Sonoma Boulevard.

Construction of the proposed project would result in temporary impacts on traffic operations and non-vehicular mobility. While temporary, this impact would be **significant** (**Impact 3.12-1**), and mitigation is provided in Section 3.12.5.

Operational Impacts

<u>Trip Generation and Distribution</u>

<u>VMT Truck and Auto Trip Generation</u>

As described in more detail in Chapter 2, Project Description, the VMT project component would consist of two phases. The first phase consists of a new wharf serving a projected four vessels a month, one at a time, and the associated truck and rail traffic that could be generated with that wharf. The second phase consists of a second wharf that would accommodate additional barge and smaller vessel activity. Based on data provided by the VMT applicant, the truck traffic that could be generated by either phase is limited by the findings of the air quality analysis. Thus, in either Phase 1 or Phase 2, the maximum daily and peak hour truck trips generated by the VMT project component have been defined as shown in Table 3.12-8. Note that a more detailed table showing estimated VMT truck traffic generation for all phases is included in Appendix L. Employee trips are estimated for the commute hours based on the total VMT employment projection and the 24-hour shift schedule. All employees are assumed to drive in single-occupant vehicles, for conservatism. Any transit use, carpooling, bicycling, or walking would reduce the trips shown in Table 3.12-8.

Table 3.12-8
Vallejo Marine Terminal Trip Generation

Vehicle Type	Daily			AM Peak Hour			PM Peak Hour		
	In	*Out*	*Total*	*In*	*Out*	*Total*	*In*	*Out*	*Total*
Trucks	87	87	174	6	6	12	4	4	12
Employees	40	40	80	13	13	26	0	13	13
Total	**127**	**127**	**254**	**19**	**19**	**38**	**4**	**17**	**25**

Source: See Appendix L for truck projections and project application materials for employment description.

Orcem Truck and Auto Trip Generation

As described in more detail in Chapter 2, Project Description, the Orcem facility would have the capability to operate in three different production modes, and has five different production milestone levels identified for each mode. Appendix L contains a detailed table presenting the projected truck traffic for each mode and milestone, based on information provided by the Orcem applicant. The maximum daily and peak hour truck trips generated by the Orcem project component would occur in Mode 2/Milestone 5, and these are shown in Table 3.12-9. Note that a more detailed table showing estimated Orcem truck traffic generation for all modes, and milestones 4 (up to 500,000 metric tons per year of product) and 5 (up to 900,000 metric tons per year of product), is included in Appendix L. Employee trips are estimated for the commute hours based on the total Orcem employment projection, and the 24-hour shift schedule. All employees are assumed to drive in single-occupant vehicles, for conservatism. Any transit use, carpooling, bicycling or walking would reduce the trips shown in Table 3.12-9.

Table 3.12-9
Orcem Trip Generation

Vehicle Type	Daily			AM Peak Hour			PM Peak Hour		
	In	*Out*	*Total*	*In*	*Out*	*Total*	*In*	*Out*	*Total*
Trucks	208	208	416	19	19	38	17	17	34
Employees	44	44	88	28	8	36	0	28	28
Total	**252**	**252**	**504**	**47**	**27**	**74**	**17**	**45**	**62**

Source: See Appendix L for truck projections and project application materials for employment description.

Vehicle Trip Distribution

The trips shown above were distributed and assigned to the roadway network using the projected truck distribution provided by the project applicants (see Figure 3.12-3). The employee trips were assigned using the same trip distribution, as it is similar to the trip distribution for commercial uses in the area as projected in the Solano-Napa Travel Demand Model (Solano Transportation Authority 2014). The project trip assignments to the study intersections are shown in Figures 3.12-4A and 3.12-4B for the VMT project component, Figures 3.12-5A and 3.12-5B for the Orcem project component, and Figures 3.12-6A and 3.12-6B for the proposed project as a whole (with both project components). Figures 3.12-7A, 3.12-7B, 3.12-8A, 3.12-8B, 3.12-9A, and 3.12-9B show the Existing Plus Project volumes for the VMT project component, the Orcem project component, and the proposed project as a whole, respectively.

Existing Plus Project Intersection Operations (Criteria A.1 – A.3)

Intersection operations were assessed for the Existing Plus Project condition for the VMT project component, the Orcem project component, and the proposed project as a whole. The LOS analyses reflect the added trucks with an increased truck percentage consistent with the number of trucks added. The Existing Plus Project intersection analysis incorporates two planned improvements that would be constructed in 2015 prior to the completion of the projects. The improvements are part of the Curtola Park and Ride Hub project, and include the installation of a signal at Lemon Street/Carlson Street, along with a new westbound left-turn pocket lane on Lemon Street and provision of separate left and right turn lanes at the park and ride lot driveway, and the provision of a separate eastbound right turn lane on Lemon Street at Curtola Parkway. Table 3.12-10 shows the LOS results.

Table 3.12-10
Existing Plus Project Peak Hour Intersection Service Levels

Intersection	Control[1]	Peak Hour	Existing Delay (LOS)[2]	Existing + VMT Delay (LOS)	Exisiting + Orcem Delay (LOS)	Existing + Combined Delay (LOS)
1. Sonoma Boulevard/ Curtola Parkway*	Signal	AM PM	19 (B) 23 (C)	20 (B) 23 (C)	20 (B) 23 (C)	20 (B) 23 (C)
2. Sonoma Boulevard/ Solano Avenue	Signal	AM PM	8 (A) 10 (A)	8 (A) 10 (A)	8 (A) 10 (A)	8 (A) 10 (A)
3. Sonoma Boulevard/ Lemon Street	Signal	AM PM	8 (A) 6 (A)	8 (A) 6 (A)	8 (A) 7 (A)	8 (A) 7 (A)
4. Sonoma Boulevard/ Winchester Street	SSSC	AM PM	1 (A) [14 (B)] 1 (A) [15 (B)]	1 (A) [15 (B)] 1 (A) [15 (B)]	1 (A) [15 (B)] 1 (A) [15 (B)]	1 (A) [15 (B)] 1 (A) [15 (B)]
5. Sonoma Boulevard/ Cherry Street	SSSC	AM PM	1 (A) [14 (B)] 1 (A) [15 (B)]	1 (A) [14 (B)] 1 (A) [15 (B)]	1 (A) [15 (B)] 1 (A) [16 (C)]	1 (A) [15 (B)] 1 (A) [16 (C)]
6. Sonoma Boulevard/ Magazine Street	Signal	AM PM	16 (B) 11 (B)	16 (B) 11 (B)	16 (B) 11 (B)	16 (B) 11 (B)
7. Sonoma Boulevard/ Sandy Beach Road	SSSC	AM PM	4 (A) [16 (C)] 2 (A) [14 (B)]	4 (A) [16 (C)] 2 (A) [14 (B)]	4 (A) [16 (C)] 2 (A) [15 (B)]	4 (A) [16 (C)] 2 (A) [15 (B)]
8. Sonoma Boulevard/ Maritime Academy Drive	Signal	AM PM	8 (A) 8 (A)	8 (A) 8 (A)	8 (A) 8 (A)	8 (A) 8 (A)

Table 3.12-10
Existing Plus Project Peak Hour Intersection Service Levels

Intersection	Control[1]	Peak Hour	Existing Delay (LOS)[2]	Existing + VMT Delay (LOS)	Exisiting + Orcem Delay (LOS)	Existing + Combined Delay (LOS)
9. Lemon Street/ Third Street	SSSC	AM PM	2 (A) [9 (A)] 2 (A) [9 (A)]	2 (A) [9 (A)] 2 (A) [9 (A)]	2 (A) [9 (A)] 2 (A) [9 (A)]	2 (A) [9 (A)] 2 (A) [9 (A)]
10. Lemon Street/ Porter Street	SSSC	AM PM	4 (A) [9 (A)] 3 (A) [9 (A)]	4 (A) [10 (A)] 3 (A) [9 (A)]	4 (A) [10 (A)] 3 (A) [10 (A)]	4 (A) [10 (A)] 3 (A) [10 (A)]
11. Lemon Street/ Grant Street	SSSC	AM PM	2 (A) [10 (A)] 1 (A) [10 (A)]	2 (A) [10 (A)] 1 (A) [10 (A)]	2 (A) [10 (A)] 1 (A) [11 (B)]	2 (A) [10 (A)] 1 (A) [11 (B)]
12. Lemon Street/Fifth Street (Lincoln Highway)	SSSC	AM PM	4 (A) [11 (B)] 5 (A) [13 (B)]	4 (A) [11 (B)] 5 (A) [13 (B)]	4 (A) [11 (B)] 5 (A) [14 (B)]	4 (A) [11 (B)] 5 (A) [14 (B)]
13. Lemon Street/ Sheridan Street	SSSC	AM PM	2 (A) [10 (A)] 1 (A) [10 (A)]	2 (A) [10 (A)] 1 (A) [11 (B)]	2 (A) [11 (B)] 1 (A) [11 (B)]	2 (A) [11 (B)] 1 (A) [11 (B)]
14. Sixth Street/ Lemon Street	SSSC	AM PM	1 (A) [11 (B)] 1 (A) [10 (A)]	1 (A) [11 (B)] 1 (A) [10 (A)]	1 (A) [11 (B)] 1 (A) [10 (A)]	1 (A) [11 (B)] 1 (A) [10 (A)]
15. Union Avenue/ Lemon Street	SSSC	AM PM	1 (A) [10 (A)] 1 (A) [11 (B)]	1 (A) [10 (A)] 1 (A) [11 (B)]	1 (A) [10 (A)] 1 (A) [11 (B)]	1 (A) [10 (A)] 1 (A) [11 (B)]
16. Lemon Street/ Carlson Street	SSSC/Signal[3]	AM PM	4 (A) [16 (C)] 10 (A) [36 (E)]	5 (A) 6 (A)	5 (A) 6 (A)	5 (A) 6 (A)
17. Lemon Street/ Curtola Parkway	Signal	AM PM	22 (C) 38 (D)	19 (B) 23 (C)	19 (B) 24 (C)	19 (B) 24 (C)

Source: See Appendix L.
Notes:

[1] Signal = signalized intersection, SSSC = side-street stop-controlled intersection.

[2] Traffic operations results include delay in seconds per vehicle and LOS grade A – F, based on delay thresholds published in the HCM (Transportation Research Board 2010). For side-street stop-controlled intersections, average delay is listed first followed by the delay for the worst approach in parentheses.

[3] Lemon/Carlson is currently a side-street stop-controlled intersection, but will be signalized in 2015 prior to the completion of the project.

* HCM2000 methodology is used for this intersection, because the five-leg configuration is not handled well in the HCM2010/Synchro 8 software.

The LOS analysis shows that there are no significant intersection impacts relative to significance Criteria A.1 – A.3 for either of the project componentss, nor for the project as a whole. The v/c ratio does not change by the increment set forth in Criteria A.1 (see Appendix L for the detailed LOS output including the v/c ratios); and the side-street stop-controlled LOS do not meet the criteria set forth in Criteria A.2 and A.3.

Based on the above analysis, project impacts under Criteria A.1 – A.3 would be **less than significant**.

Existing Plus Project Rail Crossing Impacts (Criteria A.4)

Rail Transport for VMT and Orcem Project

The combined VMT and Orcem project is anticipated to generate rail traffic consisting of 77-car trains (the largest train that can be assembled west of the first grade crossing at Sonoma

Boulevard) at a rate of an average of 2.6 trains (in and out) per week. The staging and assembly of the trains would occur on the project site and in the storage/spur tracks to the north of the site, such that this activity would not affect the Sonoma Boulevard grade crossing nor other crossings to the north. It is noted that for the rail crossing impact analysis, the train lengths are assumed to be 100 cars based on the original project information that was provided, and thus the analysis is conservative. However, the findings of the analysis below are not affected by the longer train length assumption, as discussed further below.

Based on a 60-foot rail wagon length (including coupling length), two 90-foot engines, and the track speed limit of 10 mph, the 100-car trains would take approximately 7.6 minutes to traverse each grade crossing as they move through Vallejo, American Canyon, and beyond. The crossing of Sonoma Boulevard would take an extra minute due to acceleration (for outbound trains) and deceleration (for inbound trains). As shown in Table 3.12-11, if these movements took place during the commute peak hours, this would result in the blockage of at least one upstream intersection at most of the crossings. It is reasonable to assume that similar blockages may occur, if to a somewhat lesser degree, if the crossings take place any time between 6:00 a.m. and 8:00 p.m., because traffic levels remain at or above 70% of peak hour traffic volumes during these periods, based on a review of 24-hour roadway traffic counts obtained for the Vallejo General Plan update. While traffic operations were not assessed at the adjacent intersections at each grade crossing, the projection of gate-down time (7.6 minutes) and the blockage finding indicate that these movements would result in substantial delays.

Table 3.12-11
Rail Crossing Evaluation

Crossing	Street Type	# Lanes	PM Peak Hour Roadway Volume[1]	Distance to Nearest Upstream Controlled Intersection		Vehicle Queue Storage		Queue Distance in Vehicles		Adjacent Intersection Blockages Expected?[2]		Special Notes
										VMT/Orcem (100-car trains)		
				West	*East*	*West*	*East*	*VMT*	*Orcem*	*West*	*East*	
Sonoma Boulevard (SR-29)	Arterial	4	1,080	410	240	30	20	54	18	Block	Block	
Fifth Street	Collector	2	212	300	610	10	20	16	4	Block	Clear	
Curtola Parkway	Arterial	4	1,730	160	3500	10	280	97	23	Block	Clear	3
Solano Avenue	Collector	2	434	240	760	10	30	49	12	Block	Block	3
Maine Street	Local	4	308	300	500	20	40	12	3	Clear	Clear	
Georgia Street	Collector	4	740	430	340	30	30	37	9	Block	Block	
Florida Street	Collector	4	858	390	350	30	30	47	11	Block	Block	
Louisiana Street	Local	2	76	190	210	10	10	6	1	Clear	Clear	
Tennessee Street	Arterial	4	1,720	20	340	2	30	96	23	Block	Block	3
Nebraska Street	Arterial	2	590	360	1000	10	40	55	13	Block	Block	4
Valle Vista Avenue	Collector	2	260	20	160	1	10	23	6	Block	Block	3
Redwood Street	Arterial	4	1,971	0	150	0	10	121	29	Block	Block	3
Sereno Drive	Collector	4	1,110	390	120	30	10	74	18	Block	Block	
Tuolumne Street*	Local*	4	705	350	0	30	0	35	8	Block	Block	
Lewis Brown Drive*	Arterial	4	3,800	250	390	20	30	634	150	Block	Block	
Mini Drive	Collector	4	417	20	80	2	10	17	4	Block	Block	3
American Canyon Road (City of American Canyon)*	Collector	4	2,000	60	520	5	40	557	132	Block	Block	3

Notes:

[1] Volumes as counted in May 2014 (10% of daily volume) except where noted with asterisk.

* Asterisk volumes:
Tuolumne Street taken from City of Vallejo 2008 count map.
Lewis Brown Drive estimated at similar to Sereno Drive.
American Canyon Road taken from *The Village at Vintage Ranch Traffic Impact Analysis*, December 15, 2013.

[2] Train crossing times: 7.6 minutes (plus 1 extra minute at Sonoma Boulevard due to acceleration/deceleration).

[3] Tracks adjacent to major intersection; special intersection design modifications may be needed.

[4] School located to east of crossing.

The proposed project would cause delays and queues at rail crossings that are substantial (delays of over 1 minute during peak hours, or queues that block upstream intersections during the day and early evening when traffic volumes are at or near their peak hour levels) relative to delays and queues without the project component. Therefore, the impact of the project would be **significant** (**Impact 3.12-2**), and mitigation is provided in Section 3.12.5.

Existing Plus Project Freeway Impacts (Criteria A.5 and A.6)

VMT Project Component

The VMT project component trips were added to the freeway segments to determine the Existing Plus Project change in vehicle density and LOS. For this analysis, consistent with the HCM methodology, the truck trips were converted to PCEs using a factor of two PCEs per truck, a conversion factor that is commonly used to represent the longer length of trucks relative to cars. Table 3.12-12 presents the results. The additional VMT truck and employee trips do not result in an impact based on significance Criteria A.5 and A.6. For the one freeway segment that already operates at LOS F, the westbound I-780 weave section at the I-80 loop ramps, the VMT project adds an estimated three AM peak hour trips and one PM peak hour trip, which are both below the significance threshold in Criteria A.6.

Table 3.12-12
Existing Plus Project Freeway Operations

			Existing							
			AM				*PM*			
Freeway Facility		**Type**	*Existing*	*+ VMT*	*+ Orcem*	*+ Combined Project*	*Existing*	*+ VMT*	*+ Orcem*	*+ Combined Project*
Interstate 780: Laurel St - Glen Cove Pkwy	EB	Basic	C/20.4	C/20.4	C/20.4	C/20.4	C/18.8	C/18.9	C/18.9	C/18.9
	WB	Basic	B/16.2	B/16.2	B/16.3	B/16.3	C/23.9	C/23.9	C/23.9	C/23.9
Interstate 780: I-80 Loop Ramps Weave	EB	Weave	A	A	A	A	A	A	A	A
	WB	Weave	**F/In Queue**	**F/In Queue**	**F/In Queue**	**F/In Queue**	**F/In Queue**	**F/In Queue**	**F/In Queue**	**F/In Queue**
Interstate 80: I-780 Connectors - Georgia St	EB	Basic	C/24.7	C/24.7	C/24.7	C/24.7	C/22.9	C/22.9	C/22.9	C/22.9
	WB	Basic	C/23.7	C/23.8	C/23.8	C/23.8	D/28.3	D/28.3	D/28.3	D/28.3

Table 3.12-12
Existing Plus Project Freeway Operations

Freeway Facility		Type	Existing							
			AM				*PM*			
			Existing	*+ VMT*	*+ Orcem*	*+ Combined Project*	*Existing*	*+ VMT*	*+ Orcem*	*+ Combined Project*
Interstate 80: I-780 Connector Ramps	EB	Merge	D/31.4	D/31.5	D/31.6	D/31.7	D/30.1	D/30.2	D/30.3	D/30.4
	WB	Diverge	D/32.4	D/32.5	D/32.5	D/32.6	D/36.9	D/36.9	D/36.9	D/36.9
Interstate 80: South of Sonoma Blvd	EB	Basic	A/10.0	A/10.0	A/10.0	A/10.1	C/18.2	C/18.2	C/18.3	C/18.4
	WB	Basic	C/21.6	C/21.6	C/21.7	C/21.7	B/12.1	B/12.1	B/12.2	B/12.2

Source: See Appendix L.
Notes: LOS = Level of service; WB = Westbound; EB = Eastbound.
Bold indicates segments operating below the Caltrans LOS standard of D.

Orcem Project Component

The Orcem project component trips were added to the freeway segments to determine the Existing Plus Project change in vehicle density and LOS. As with the VMT analysis, the truck trips were converted to PCEs using a factor of two PCE per truck. The results are shown in Table 3.12-12. The additional Orcem truck and employee trips do not result in an impact based on significance Criteria A.5 and A.6. For the one freeway segment that already operates at LOS F, the westbound I-780 weave section at the I-80 loop ramps, the Orcem project component adds an estimated nine AM peak hour trips and three PM peak hour trips, which are both below the significance threshold in Criteria A.6.

It is noted that the combined impact of both project components also does not result in a significant impact under Criteria A.5 or A.6, as shown in Table 3.12-12. The project as a whole adds only 12 AM peak hour trips and 4 PM peak hour trips to the one LOS F segment.

Combined VMT and Orcem Project Components

Based on the above analysis, no impacts of the project as a whole are identified under Criteria A.5 and A.6. Impacts would therefore be **less than significant**.

Cumulative Impacts

The cumulative traffic impacts represent conditions at year 2040, with traffic growth at the intersections and freeway segments in the study area. Based on a review of projected growth in the Solano-Napa Travel Demand Model, the following yearly growth rates were applied to the existing traffic volumes to represent growth from all regional and local land use development between 2014 and 2040:

- Traffic volumes along Sonoma Boulevard, Curtola Parkway, and the freeways: 1% per year
- Traffic Volumes along Lemon Street: 0.25% per year
- Traffic volumes on I-80 and I-780: 1% per year

Figures 3.12-10A and 3.12-10B present the Cumulative (2040) Without Project intersection traffic volumes. Figures 3.12-11A, 3.12-11B, 3.12-12A, 3.12-12B, 3.12-13A, and 3.12-13B present the Cumulative Plus Project intersection traffic volumes for the VMT project component, the Orcem project component, and proposed project as a whole, respectively.

Cumulative Intersection Operations (Criteria A.1 – A.3)

Intersection operations were assessed for the Cumulative Plus Project condition for the VMT project component, the Orcem project component, and the project as a whole. The LOS analyses reflect the added trucks with an increased truck percentage consistent with the number of trucks added. The Cumulative Plus Project intersection analysis incorporates two planned improvements that will be constructed in 2015 prior to the completion of the projects. The improvements are part of the Curtola Park and Ride Hub project, and include the installation of a signal at Lemon Street/Carlson Street, along with a new westbound left-turn pocket lane on Lemon Street and provision of separate left and right turn lanes at the park and ride lot driveway, and the provision of a separate eastbound right turn lane on Lemon Street at Curtola Parkway. No other roadway or intersection improvements are assumed.

Table 3.12-13 shows the LOS results.

Table 3.12-13
Year 2040 Peak Hour Intersection LOS[1]

Intersection	Control[2]	Peak Hour	Cumulative Delay (LOS)	Cumulative + VMT Delay (LOS)	Cumulative + Orcem Delay (LOS)	Cumulative + Combined Project Delay (LOS)
1. Sonoma Boulevard/ Curtola Parkway*	Signal	AM PM	26 (C) 32 (C)	26 (C) 32 (C)	26 (C) 33 (C)	26 (C) 33 (C)
2. Sonoma Boulevard/ Solano Boulevard	Signal	AM PM	9 (A) 11 (B)	9 (A) 11 (B)	9 (A) 11 (B)	9 (A) 11 (B)
3. Sonoma Boulevard/ Lemon Street	Signal	AM PM	6 (A) 7 (A)	7 (A) 7 (A)	7 (A) 8 (A)	8 (A) 8 (A)
4. Sonoma Boulevard/ Winchester Street	SSSC	AM PM	2 (A) [20 (C)] 2 (A) [21 (C)]	2 (A) [20 (C)] 2 (A) [21 (C)]	2 (A) [20 (C)] 2 (A) [21 (C)]	2 (A) [21 (C)] 2 (A) [22 (C)]

Table 3.12-13
Year 2040 Peak Hour Intersection LOS[1]

Intersection	Control[2]	Peak Hour	Cumulative Delay (LOS)	Cumulative + VMT Delay (LOS)	Cumulative + Orcem Delay (LOS)	Cumulative + Combined Project Delay (LOS)
5. Sonoma Boulevard/ Cherry Street	SSSC	AM PM	2 (A) [19 (C)] 2 (A) [22 (C)]	2 (A) [20 (C)] 2 (A) [22 (C)]	2 (A) [20 (C)] 2 (A) [23 (C)]	2 (A) [20 (C)] 2 (A) [23 (C)]
6. Sonoma Boulevard/ Magazine Street	Signal	AM PM	12 (B) 11 (B)	12 (B) 11 (B)	12 (B) 11 (B)	12 (B) 11 (B)
7. Sonoma Boulevard/ Sandy Beach Road	SSSC	AM PM	5 (A) [19 (C)] 2 (A) [17 (C)]	5 (A) [20 (C)] 2 (A) [17 (C)]	5 (A) [20 (C)] 2 (A) [18 (C)]	5 (A) [21 (C)] 2 (A) [18 (C)]
8. Sonoma Boulevard/ Maritime Academy Drive	Signal	AM PM	8 (A) 9 (A)	8 (A) 9 (A)	8 (A) 9 (A)	8 (A) 9 (A)
9. Lemon Street/Third Street	SSSC	AM PM	3 (A) [9 (A)] 4 (A) [9 (A)]	3 (A) [9 (A)] 4 (A) [9 (A)]	3 (A) [9 (A)] 4 (A) [10 (A)]	3 (A) [9 (A)] 4 (A) [10 (A)]
10. Lemon Street/ Porter Street	SSSC	AM PM	5 (A) [9 (A)] 4 (A) [10 (A)]	5 (A) [10 (A)] 4 (A) [10 (A)]	5 (A) [10 (A)] 4 (A) [10 (A)]	5 (A) [10 (A)] 4 (A) [10 (A)]
11. Lemon Street/ Grant Street	SSSC	AM PM	3 (A) [11 (B)] 2 (A) [12 (B)]	3 (A) [11 (B)] 2 (A) [12 (B)]	3 (A) [11 (B)] 2 (A) [12 (B)]	3 (A) [11 (B)] 2 (A) [12 (B)]
12. Lemon Street/Fifth Street (Lincoln Highway)	SSSC	AM PM	5 (A) [12 (B)] 6 (A) [15 (B)]	5 (A) [12 (B)] 6 (A) [16 (C)]	5 (A) [12 (B)] 6 (A) [16 (C)]	5 (A) [13 (B)] 6 (A) [17 (C)]
13. Lemon Street/ Sheridan Street	SSSC	AM PM	3 (A) [12 (B)] 1 (A) [11 (B)]	3 (A) [12 (B)] 1 (A) [11 (B)]	3 (A) [12 (B)] 1 (A) [12 (B)]	3 (A) [12 (B)] 1 (A) [12 (B)]
14. Sixth Street/ Lemon Street	SSSC	AM PM	1 (A) [11 (B)] 1 (A) [11 (B)]	1 (A) [12 (B)] 1 (A) [11 (B)]	1 (A) [12 (B)] 1 (A) [12 (B)]	1 (A) [12 (B)] 1 (A) [12 (B)]
15. Union Avenue/ Lemon Street	SSSC	AM PM	1 (A) [10 (A)] 1 (A) [11 (B)]	1 (A) [11 (B)] 1 (A) [12 (B)]	1 (A) [11 (B)] 1 (A) [12 (B)]	1 (A) [11 (B)] 1 (A) [12 (B)]
16. Lemon Street/ Carlson Street[3]	SSSC	AM PM	6 (A) 7 (A)	6 (A) 7 (A)	6 (A) 7 (A)	6 (A) 7 (A)
17. Lemon Street/ Curtola Parkway	Signal	AM PM	20 (B) 26 (C)	21 (B) 26 (C)	21 (B) 27 (C)	21 (B) 27 (C)

Source: See Appendix L.

Notes:

[1] Traffic operations results include delay in seconds per vehicle and LOS grade A – F, based on delay thresholds published in the HCM (Transportation Research Board 2010). For side-street stop-controlled intersections, average delay is listed first followed by the delay for the worst approach in parentheses.

[2] Signal = signalized intersection, SSSC = side-street stop-controlled intersection.

[3] Lemon/Carlson is currently a side-street stop-controlled intersection, but will be signalized in 2015 prior to the completion of the project.

* HCM2000 methodology is used for this intersection, because the five-leg configuration is not handled well in the HCM2010/Synchro 8 software.

The LOS analysis shows that there are no significant cumulative intersection impacts relative to significance Criteria A.1 – A.3 for either of the projects, nor for the combined projects. Relative to the Cumulative No Project condition, the v/c ratio does not change by the increment set forth in Criteria A.1 (see Appendix L for the detailed LOS output including the v/c ratios), and the side-street stop-controlled levels of service do not meet the criteria set forth in Criteria A.2 and A.3.

Based on the above analysis, cumulative impacts under Criteria A.1 – A.3 would be **less than significant**.

Cumulative Rail Crossing Impacts (Criteria A.4)

The rail crossing impacts discussed under the Existing Plus Project section above would worsen as traffic volumes grow on the various streets that have grade crossings with the railroad tracks. While a quantitative analysis for the cumulative (year 2040) condition was not performed, the intersection blockages and driver delays can reasonably be expected to worsen over time with the traffic volume growth.

Combined VMT and Orcem Project Components

As described previously, the proposed project would cause delays and queues at rail crossings that are substantial (delays of over 1 minute during peak hours, or queues that block upstream intersections during the day and early evening when traffic volumes are at or near their peak hour levels) relative to delays and queues in the Cumulative No Project condition. Therefore, the cumulative impact of the project would be **significant** (**Impact 3.12-3**), and mitigation is provided in Section 3.12.5.

Cumulative Freeway Impacts (Criteria A.5 and A.6)

VMT Project Component

The VMT trips were added to the Cumulative No Project freeway segment volumes to determine the Cumulative Plus Project change in vehicle density and LOS. For this analysis, consistent with the HCM methodology, the truck trips were converted to PCEs using a factor of two PCE per truck. Table 3.12-14 presents the results. The additional VMT truck and employee trips do not result in an impact based on significance Criteria A.5 and A.6. While several segments are projected to operate at LOS E or F in 2040, the project would add fewer than 10 trips to these segments, whereas the significance threshold as defined under A.5 is 50 peak hour trips. Two freeway segments are projected to operate at LOS F in the cumulative condition. At the westbound I-780 weave section at the I-80 loop ramps, the VMT project component would add an estimated three AM peak hour trips and one PM peak hour trip; and at the westbound I-80 off-ramp to I-780/Curtola Parkway westbound, the VMT project component would add one trip in the PM peak hour. These trips fall below the significance threshold in Criteria A.6.

Table 3.12-14
Cumulative (Year 2040) With Project Freeway Operations

Freeway Facility		Type	2040							
			AM				*PM*			
			2040 LOS	*+ VMT LOS*	*+ ORCEM LOS*	*+ Combined Project LOS*	*2040 LOS*	*+ VMT LOS*	*+ ORCEM LOS*	*+ Combined Project LOS*
Interstate 780: Laurel St - Glen Cove Pkwy	EB	Basic	D/26.1	D/26.1	D/26.1	D/26.1	C/23.9	C/23.9	C/23.9	C/23.9
	WB	Basic	C/20.4	C/20.5	C/20.5	C/20.5	D/32.1	D/32.1	D/32.1	D/32.1
Interstate 780: I-80 Loop Ramps Weave	EB	Weave	A	A	A	A	B	B	B	B
	WB	Weave	**F/In Queue**	**F/In Queue**	**F/In Queue**	**F/In Queue**	**F/In Queue**	**F/In Queue**	**F/In Queue**	**F/In Queue**
Interstate 80: I-780 Connectors - Georgia St	EB	Basic	D/33.5	D/33.5	D/33.5	D/33.6	D/30.2	D/30.2	D/30.2	D/30.3
	WB	Basic	D/31.8	D/31.8	D/31.8	D/31.9	**E/40.8**	**E/40.8**	**E/40.9**	**E/40.9**
Interstate 80: I-780 Connector Ramps	EB	Merge	**E/38.4**	**E/38.5**	**E/38.6**	**E/38.7**	**E/36.7**	**E/36.8**	**E/36.9**	**E/37.0**
	WB	Diverge	**E/39.1**	**E/39.1**	**E/39.2**	**E/39.2**	**F/44.4**	**F/44.4**	**F/44.5**	**F/44.5**
Interstate 80: South of Sonoma Blvd	EB	Basic	B/12.6	B/12.6	B/12.6	B/12.7	C/23.0	C/23.0	C/23.1	C/23.1
	WB	Basic	D/28.0	D/28.1	D/28.2	D/28.2	B/15.3	B/15.3	B/15.3	B/15.3

Source: See Appendix L.
Notes: LOS = Level of service; NB = Northbound; SB = Southbound; WB = Westbound; EB = Eastbound.
Bold indicates segments operating below the Caltrans LOS standard of D.

Orcem Project Component

The Orcem project component trips were added to the Cumulative No Project freeway segment volumes to determine the Cumulative Plus Project change in vehicle density and LOS. As with the VMT analysis, the truck trips were converted to PCEs using a factor of two PCEs per truck. The results are shown in Table 3.12-14. The additional Orcem truck and employee trips do not result in an impact based on significance Criteria A.5 and A.6. While several segments are projected to operate at LOS E or F in 2040, the project adds fewer than 20 trips to these segments, whereas the significance threshold as defined under A.5 is 50 peak hour trips. Two freeway segments are projected to operate at LOS F in the cumulative condition. At the westbound I-780 weave section at the I-80 loop ramps, the Orcem project component would add an estimated nine AM peak hour trips and three PM peak hour trips; and at the westbound I-80 off-ramp to I-780/Curtola Parkway westbound, the VMT project component would add seven trips in the PM peak hour. These trips fall below the significance threshold in Criteria A.6.

Combined VMT and Orcem Project Components

It is noted that the combined project impact also would not result in a significant impact under Criteria A.5 or A.6, as shown in Table 3.12-14. The combined projects would add 12 AM peak hour trips and 4 PM peak hour trips to the westbound I-780 weave section at the I-80 loop ramps, and 8 PM peak hour trips to the westbound I-80 off-ramp to I-780/Curtola Parkway westbound. Based on the above analysis, cumulative project impacts under Criteria A.5 and A.6 would be **less than significant**.

B) Would the project conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

VMT and Orcem Project Analysis

As shown in Tables 3.12-10 and 3.12-12, neither the VMT project component nor the Orcem project component would result in a significant impact relative to Criteria B.1 and B.2 (refer to Thresholds of Significance, Section 3.12.3). Neither project would cause the intersection of Sonoma Boulevard/Curtola Parkway to fall below the CMP standard of LOS E (Criteria B.1) and neither project would cause a freeway segment to fall below the CMP standard for that segment (Criteria B.2). In addition, the combined projects would not result in significant impacts under these criteria. Based on the above analysis, impacts would be **less than significant**.

C) Would the project substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

VMT and Orcem Project Analysis

Both the VMT and Orcem project components would generate new truck trips that would travel on Lemon Street, Sonoma Boulevard, and Curtola Parkway to gain access to the freeway system. Sonoma Boulevard and Curtola Parkway are major four-lane arterial roadways designed to accommodate large trucks, and the impact of the additional trucks on safe roadway operation and safe pedestrian and bicycle movement is projected to be less than significant. Lemon Street east of Sonoma Boulevard is an arterial roadway with a 36-foot width, on-street parking, and center double yellow striping defining the two travel lanes (with additional width and turning capacity at

Curtola Parkway); west of Sonoma Boulevard, Lemon Street has the same configuration, although there is no center double yellow striping to define the lanes. Since all truck trips generated by both projects would use this section of Lemon Street to access the rest of the roadway network, certain pavement and striping improvements are needed to allow safe movements for trucks, other vehicles, pedestrians, and bicyclists between Derr Avenue and Sonoma Boulevard. These needed safety improvements include pavement strengthening, centerline striping, potential on-street parking changes, and intersection improvements at Lemon Street/Sonoma Boulevard to provide adequate sight distance and maneuvering capacity for trucks.

The proposed project would require physical improvements to Lemon Street in order to provide safe and efficient vehicle movements. This impact would be **significant** (**Impact 3.12-4**), and mitigation is provided in Section 3.12.5.

D) Would the project result in inadequate emergency access?

VMT and Orcem Project Analysis

The proposed project is projected to potentially have a significant impact on emergency access, based on the findings under Criteria A.4 (rail crossings) above. The project is projected to have a significant impact on emergency access, based on the potential delays generated by train crossings at the grade crossings in Vallejo, American Canyon, and crossings further north, as identified relative to Criteria A.4. This impact would be **significant** (**Impact 3.12-5**), and mitigation is provided in Section 3.12.5.

E) Would the project conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

VMT and Orcem Project Analysis

Both projects would add substantial truck traffic to Lemon Street between the project site and Sonoma Boulevard, and to a lesser extent between Sonoma Boulevard and Curtola Parkway, relative to the current daily traffic volume on this street. Lemon Street is a designated arterial roadway; east of Sonoma Boulevard it has a volume ranging from approximately 2,700 vehicles per day near Sonoma Boulevard and 9,440 vehicles per day near Curtola Parkway. West of Sonoma Boulevard, Curtola Parkway is a designated arterial roadway with a current daily traffic volume of 856 vehicles per day.

On the section of Lemon Street between Derr Avenue and Sonoma Boulevard, the VMT project component is projected to add 174 daily truck trips and 80 daily commute trips (a combined 30% increase), and the Orcem project component is projected to add 416 daily truck trips and 88 daily commute trips (a combined 59% increase), for a combined project increase of 89%. The increased traffic volume would substantially change the pedestrian and bicycling environment on this section of Lemon Street, increasing the volume from a level consistent with a local street to that of a lower-volume collector street.

On Lemon Street between Sonoma Boulevard and Curtola Parkway, the existing traffic volumes are higher, ranging from an estimated 2,700 vehicles per day just east of Sonoma Boulevard to 9,437 vehicles per day just west of Curtola Boulevard. The daily combined project trips are estimated to represent 56% of the total future trip generation along this segment of roadway. For the VMT project component, this equates to 86 daily truck trips and 45 commute trips, which combined represent an increase of 5% relative to the lower-volume end of Lemon Street (just east of Sonoma Boulevard) and 1% relative to the higher-volume end of Lemon Street (just west of Curtola Boulevard). The Orcem project component adds 233 daily truck trips and 49 daily commute trips to this section of Lemon Street, which is an increase of 10% relative to the lower-volume end of Lemon Street (just east of Sonoma Boulevard) and 3% relative to the higher-volume end of Lemon Street (just west of Curtola Boulevard). While these increases are within the normal traffic variation that most streets experience on a day-to-day basis, the fact that most of the trips would be heavy trucks means that residents with driveways along this section of Lemon Street, and local pedestrians and bicyclists, would find their mobility impacted in terms of driver convenience accessing individual driveways and in terms of the comfort and convenience for bicycling and walking trips along Lemon Street, particularly in the residential section just west and east of Sonoma Boulevard.

In addition to the impacts of trucks on Lemon Street, the impact of the train movements at the grade crossings in the City, as well as near many of the non-grade crossing locations with proximate streets and intersections, would make pedestrian and bicycle movements near and across these locations less convenient, and even potentially unsafe without appropriate barriers in the case of the non-grade crossing locations. Given CPUC regulations governing safety standards for grade and non-crossings, improvements to reduce hazards to **less-than-significant** levels would be completed prior to the use of project rail service for those grade crossing locations with proximate streets and intersections, where pedestrian and bicycle movements across the tracks are currently physically possible. These intersections will be brought into compliance with code requirements for active tracks, including appropriate barriers and passive active warning signs and devices. The Public Works Department shall determine the project's fair-share costs allocation for the necessary improvements.

The project's added operational auto and truck trips on Lemon Street would make local vehicle, pedestrian, and bicycle movements less safe and convenient. Based on threshold of significance E.2, This impact would be **significant** (**Impact 3.12-6**), and mitigation is provided in Section 3.12.5.

3.12.5 Mitigation Measures

Mitigation for Impact 3.12-1: Construction of the proposed project would result in temporary impacts on traffic operations and non-vehicular mobility.

MM-3.12-1 The City of Vallejo shall require that a Construction Traffic Management Plan be developed as part of a larger Construction Management Plan to address potentially significant impacts during construction of the VMT and Orcem project components. As part of the plan development, the project applicants and their construction contractors shall meet with appropriate City of Vallejo departments to determine traffic management strategies to reduce, to the maximum extent feasible, traffic congestion and the effects of parking demand by construction workers during construction of the projects and other nearby projects that could be simultaneously under construction. The project applicants shall develop the plans for review and approval by the appropriate City departments. The plans shall include at least the following items and requirements:

A. A set of comprehensive traffic control measures, including scheduling of major truck trips and deliveries to avoid peak traffic hours, detour signs if required, lane closure procedures, signs, cones for drivers, and designated construction access routes.

B. Notification procedures for adjacent property owners and public safety personnel regarding when major deliveries, detours, and lane closures will occur.

C. Location of construction staging areas for materials, equipment, and vehicles at an approved location.

D. A process for responding to, and tracking, complaints pertaining to construction activity, including identification of an on-site complaint manager. The manager shall determine the cause of the complaints and shall take prompt action to correct the problem. A complaint manager shall be designated and their name and phone number shall be provided to Planning and Zoning prior to the issuance of the first permit issued by Building Services.

E. Provision for accommodation of pedestrian flow.

F. Provision for parking management and spaces on the project site for all construction workers to ensure that construction workers do not park in on-street spaces.

G. Any damage to the street caused by heavy equipment, or as a result of this construction, shall be repaired, at the project applicant’s expense, within 1 week of the occurrence of the damage (or excessive wear), unless further damage/excessive wear may continue; in such case, repair shall occur prior to issuance of a final inspection of the building permit and in coordination with MM-3.12-4a. All damage that is a threat to public health or safety shall be repaired immediately. The street shall be restored to its condition prior to the new construction as established by the City Building Inspector and/or photo documentation, at the project sponsor's expense, before the issuance of a Certificate of Occupancy.

H. Any heavy equipment brought to the construction site shall be transported by truck, where feasible.

I. No materials or equipment shall be stored on the traveled roadway at any time.

J. Prior to construction, a portable toilet facility and a debris box shall be installed on the site, and properly maintained through project completion.

K. All equipment shall be equipped with mufflers.

L. Prior to the end of each work day during construction, the contractor or contractors shall pick up and properly dispose of all litter resulting from or related to the project, whether located on the property, within the public rights-of-way, or properties of adjacent or nearby neighbors.

Mitigation for the following impacts:

Impact 3.12-2: The proposed project would cause substantial delays and queues at rail crossings (delays of over 1 minute during peak hours, or queues that block upstream intersections during the day and early evening when traffic volumes are at or near their peak hour levels) relative to delays and queues without the project.

Impact 3.12-3: The proposed project would cause substantial delays and queues at rail crossings (delays of over 1 minute during peak hours, or queues that block upstream intersections during the day and early evening when traffic volumes are at or near their peak hour levels) relative to delays and queues in the Cumulative No Project condition.

Impact 3.12-5: The proposed project would have a significant impact on emergency access, based on the potential delays generated by train crossings at the grade crossings in Vallejo, American Canyon, and crossings further north.

MM-3.12-2a The applicants shall work with the California Northern Railroad to limit train movements through Vallejo to between 9:00 a.m. and 4:00 p.m., thus minimizing the traffic queueing associated with the train movements across the grade crossings throughout the city during peak commute hours.

MM-3.12-2b Prior to the issuance of permits for rail operations, the project applicants shall notify the police and fire departments of proposed rail operations and potential delays to facilitate alternative routing during emergencies.

Mitigation for Impact 3.12-4: The proposed project would require physical improvements to Lemon Street in order to provide safe and efficient vehicle movements.

MM-3.12-3 To provide for the safe movement of project trucks along with other existing pedestrian, bicycle, and vehicular traffic on Lemon Street between the project site and Sonoma Boulevard and through the intersection of Lemon Street/Sonoma Boulevard, the applicants shall retain the services of a qualified engineer to prepare a structural pavement assessment for this segment of roadway, which shall be submitted for review and approval by the City Public Works Department. The assessment shall evaluate the existing pavement condition/strength against the project's demands utilizing methodology acceptable to the City, and shall identify recommended improvements (for example, overlay, reconstruction, base repair, etc.) necessary to meet this demand, based on the schedule of combined VMT and Orcem truck traffic. The City shall determine the project's fair-share allocation of costs in relationship to overall improvement costs, and all necessary improvements shall be made prior to the issuance of a certificate of occupancy.

In addition, the applicants shall work with the City of Vallejo Public Works Department to identify, design, and prepare a cost estimate for those physical improvements necessary to provide adequate sight distance and maneuvering capacity for trucks along this segment of roadway, including the intersection at Lemon Street/Sonoma Boulevard. The needed improvements may include for example, centerline striping, potential on-street parking changes, sidewalk gap closures and widenings. The applicants shall provide an engineers cost esimtate for the improvements, to be approved by the Public Works Department. The Public Works Department shall determine the project's fair-share cost allocation for the necessary improvements. All necessary improvements shall be constructed prior to the issuance of a certificate of occupancy.

Mitigation for Impact 3.12-6: The proposed project's added operational auto and truck trips on Lemon Street would make local vehicle, pedestrian, and bicycle movements unsafe or less convenient.

MM-3.12-4 The project applicants shall work with the City of Vallejo to identify, design, and construct improvements on Lemon Street between the project site and Curtola Parkway, where not already funded or completed, based on the project truck traffic phasing, to provide for safe movement of pedestrians and bicycles along and across this section of roadway, and to provide for the safe movement of project trucks through portions of this roadway where existing residential driveways take direct access, consistent with the applicable General Plan policies (see Section 3.12.1). Improvements may include, but are not limited to, the following:

- Provision of continuous 4-foot minimum-width sidewalks from Alden Street to Curtola Parkway, including closure of all gaps.
- Installation of high-visibility crosswalks (i.e., continental or zebra striping, and installation of pedestrian hybrid beacon or rectangular rapid flashing beacon devices if indicated by an engineering study), with curb extensions where feasible, at high-pedestrian use intersections as identified by the Public Works Department, including the intersections of Lemon Street with Sheridan Street, Lincoln Highway, Sonoma Boulevard, and Porter Street.
- Lowering of the speed limit to 25 miles per hour (mph), subject to an engineering and traffic survey supporting the speed zone. The project applicants shall be responsible for funding of the study and the actual costs of signage and street markings.

The project applicants shall provide an engineer’s cost estimate for the necessary improvements, to be approved by the Public Works Department. The Public Works Department shall determine the project’s fair-share costs allocation for the necessary improvements. The necessary improvements shall be constructed prior to the issuance of a certificate of occupancy.

3.12.6 Level of Significance After Mitigation

Impact 3.12-1: With implementation of MM-3.12-1, which requires a Construction Traffic Management Plan to address impacts during construction of the proposed project, Impact 3.12-1 would be reduced to a **less-than-significant** level.

Impacts 3.12-2, 3.12-3, and 3.12-5: Implementation of MM-3.12-2a would be dependent on the California Northern Railroad, since the City does not have jurisdiction over the railroad. While the City can require the applicants to work with the California Northern Railroad to avoid peak commute hours, the City cannot ensure that the California Northern Railroad will agree to the desired hours of operation. In addition, similar blockages may occur, if to a somewhat lesser degree, if the crossings take place any time between 6:00 a.m. and 8:00 p.m., because traffic levels remain at or above 70% of peak-hour traffic volumes during these periods. MM-3.12-2b would be implemented to provide emergency service providers with the opportunity to plan alternative routing during emergencies; however, delays due to rail operations could still impact emergency evacuation routes. For these reasons, Impacts 3.12-2, 3.12-3, and 3.12-5 would remain **significant and unavoidable** with mitigation.

Impact 3.12-4: With implementation of MM-3.12-3, improvements to Lemon Street from the project site through the intersection of Lemon Street/Sonoma Boulevard would be required to provide for safe vehicle movements. Impact 3.12-4 would be reduced to a **less-than-significant** level with this mitigation.

Impact 3.12-6: With implementation of MM-3.12-4, improvements to Lemon Street between the project site and Curtola Parkway would be required to provide for safe movement of pedestrians, bicycles, and trucks. Impact 3.12-6 would be reduced to a less-than-significant level with this mitigation.

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SOURCE: Fehr and Peers

FIGURE 3.12-1

Project Study Area

VALLEJO MARINE TERMINAL AND ORCEM PROJECT DRAFT EIR

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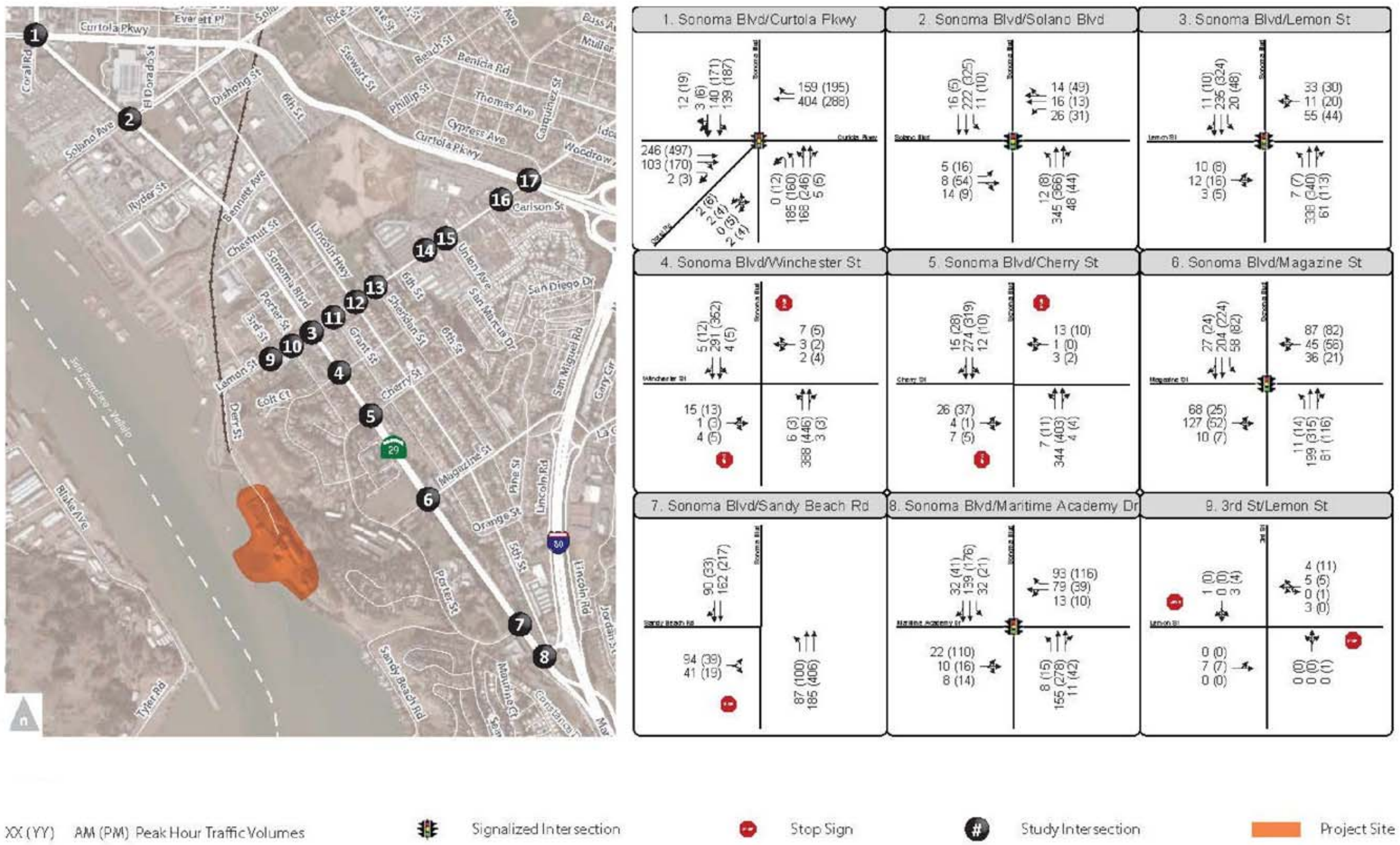

Note: *Counts conducted in April 2014.*

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SOURCE: Fehr and Peers 2014

FIGURE 3.12-2A

Existing Peak Hour Intersection Traffic Volumes

VALLEJO MARINE TERMINAL AND ORCEM PROJECT DRAFT EIR

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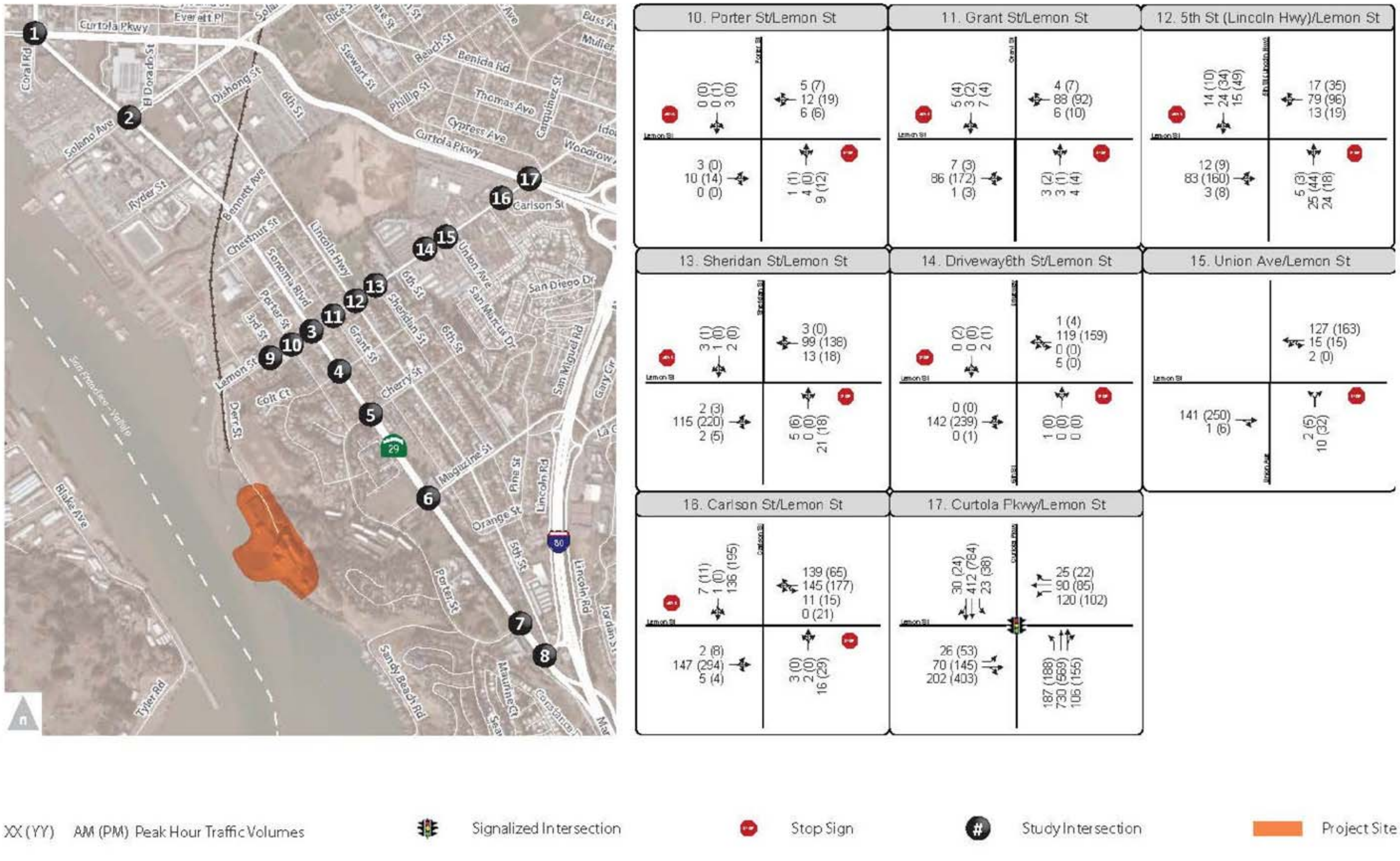

Note: *Counts conducted in April 2014.*

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SOURCE: Fehr and Peers 2014

FIGURE 3.12-2B

Existing Peak Hour Intersection Traffic Volumes

VALLEJO MARINE TERMINAL AND ORCEM PROJECT DRAFT EIR

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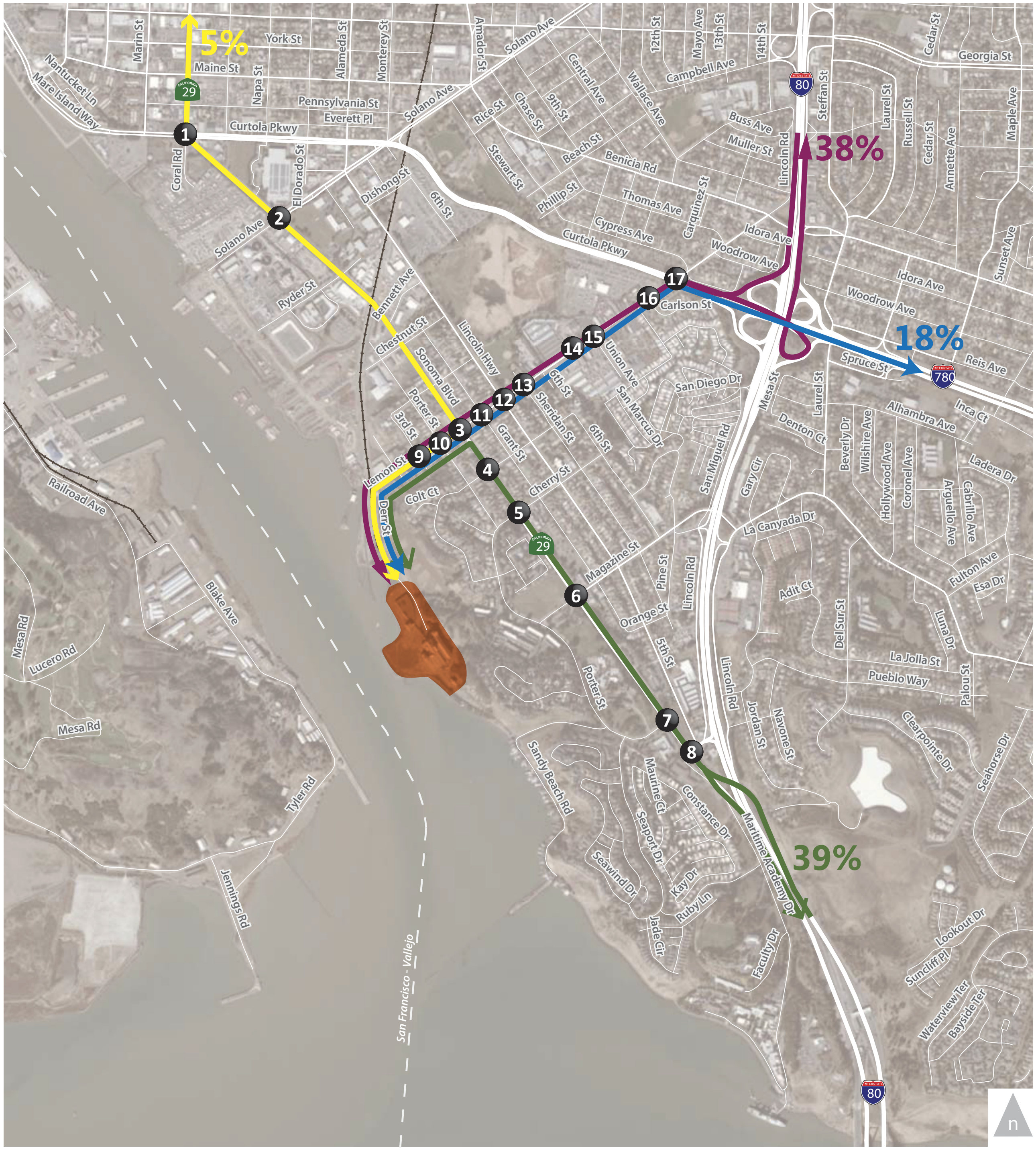

● Study Intersection

🟧 Project Site

Note: *This distribution was applied to truck trips and employee commute trips.*

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SOURCE: Fehr and Peers

FIGURE 3.12-3

Trip Distribution for ORCEM and VMT

VALLEJO MARINE TERMINAL AND ORCEM PROJECT DRAFT EIR

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Note: *Volumes include trucks and staff trips.*

SOURCE: Fehr and Peers 2014

FIGURE 3.12-4A

Vallejo Marine Terminal Project Trip Assignment

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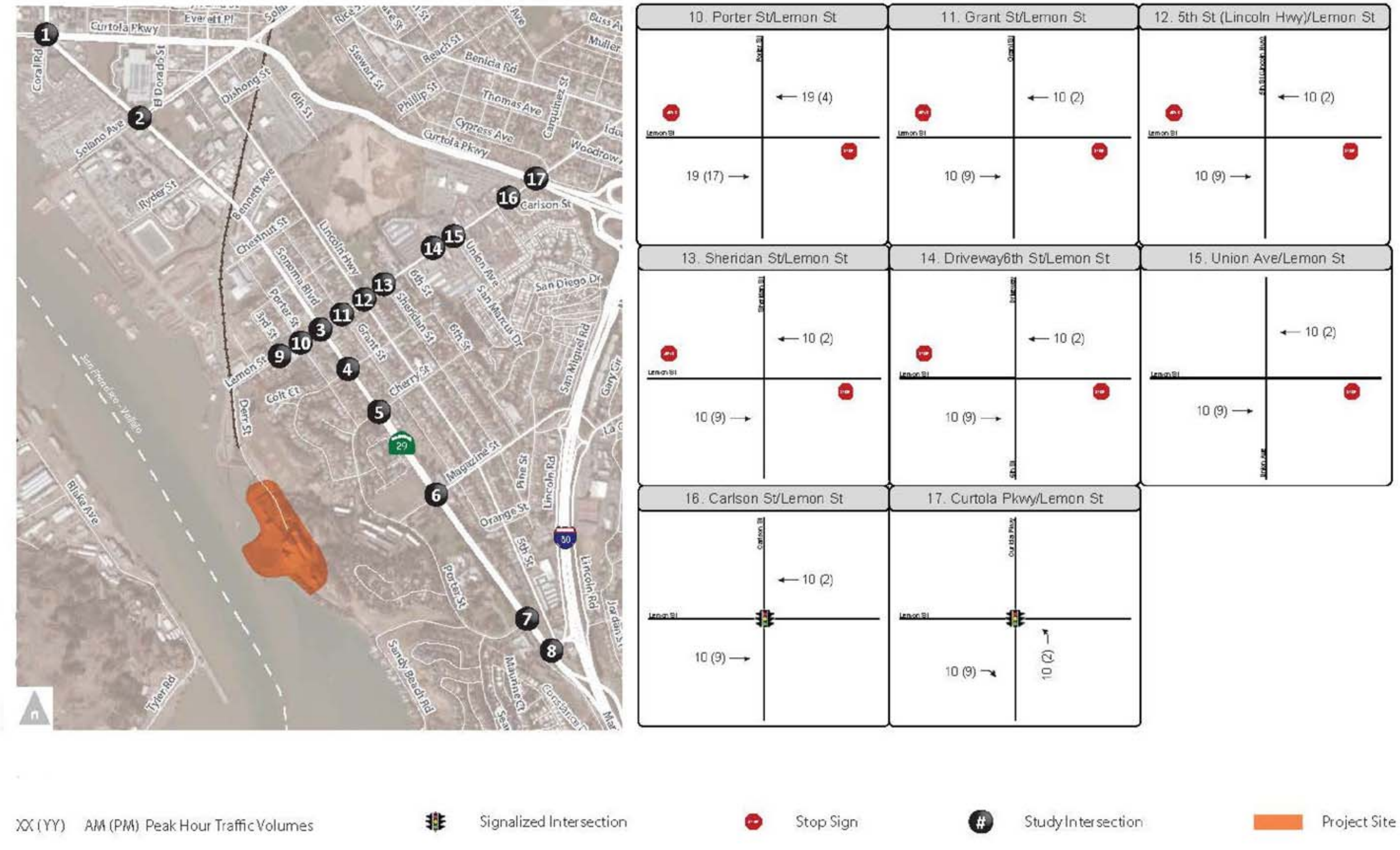

Note: *Volumes include trucks and staff trips.*

SOURCE: Fehr and Peers 2014

FIGURE 3.12-4B

Vallejo Marine Terminal Project Trip Assignment

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Note: Volumes include trucks and staff trips.

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SOURCE: Fehr and Peers 2014

FIGURE 3.12-5A

Orcem Project Trip Assignment

VALLEJO MARINE TERMINAL AND ORCEM PROJECT DRAFT EIR

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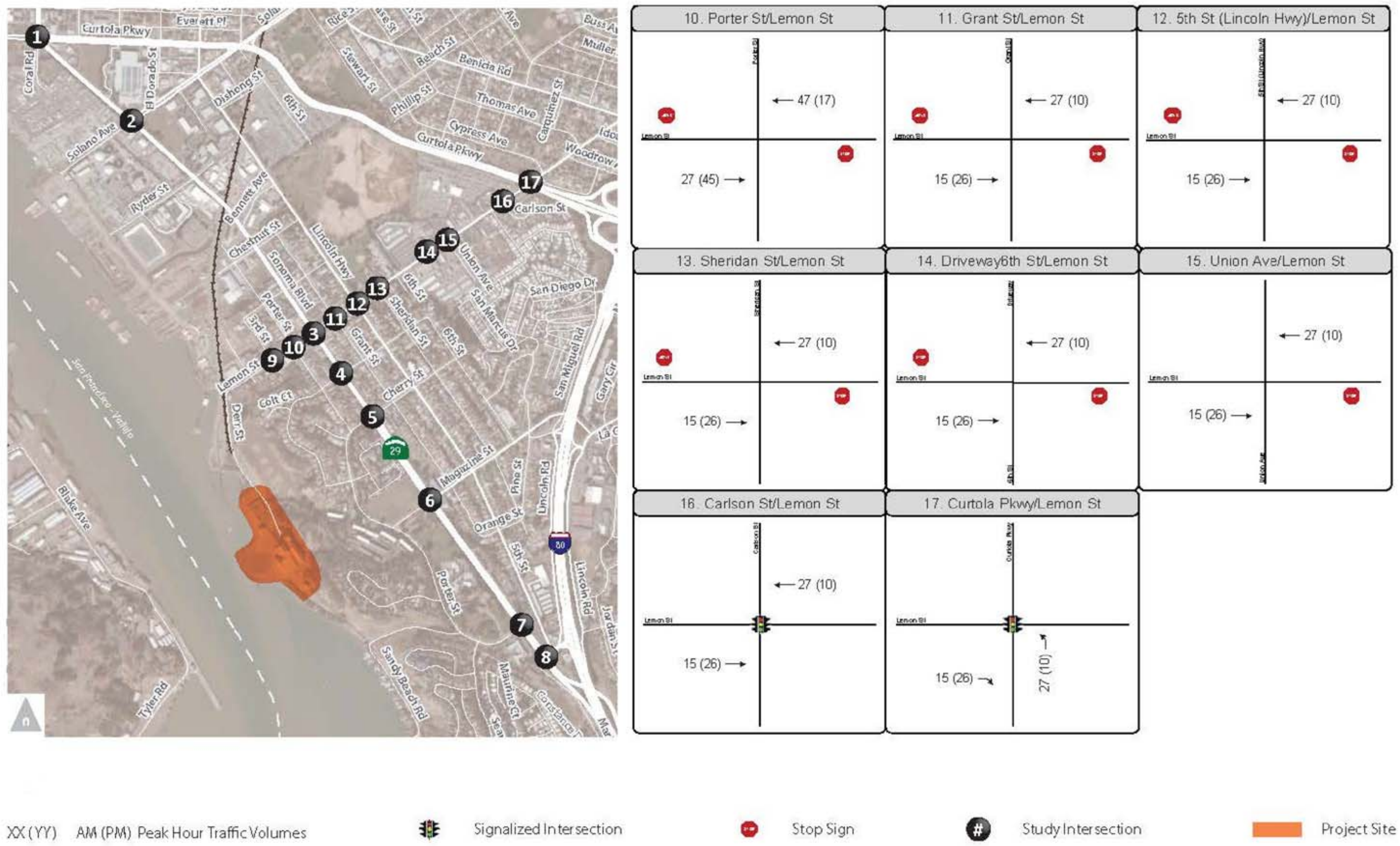

Note: Volumes include trucks and staff trips.

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SOURCE: Fehr and Peers 2014

FIGURE 3.12-5B

Orcem Project Trip Assignment

VALLEJO MARINE TERMINAL AND ORCEM PROJECT DRAFT EIR

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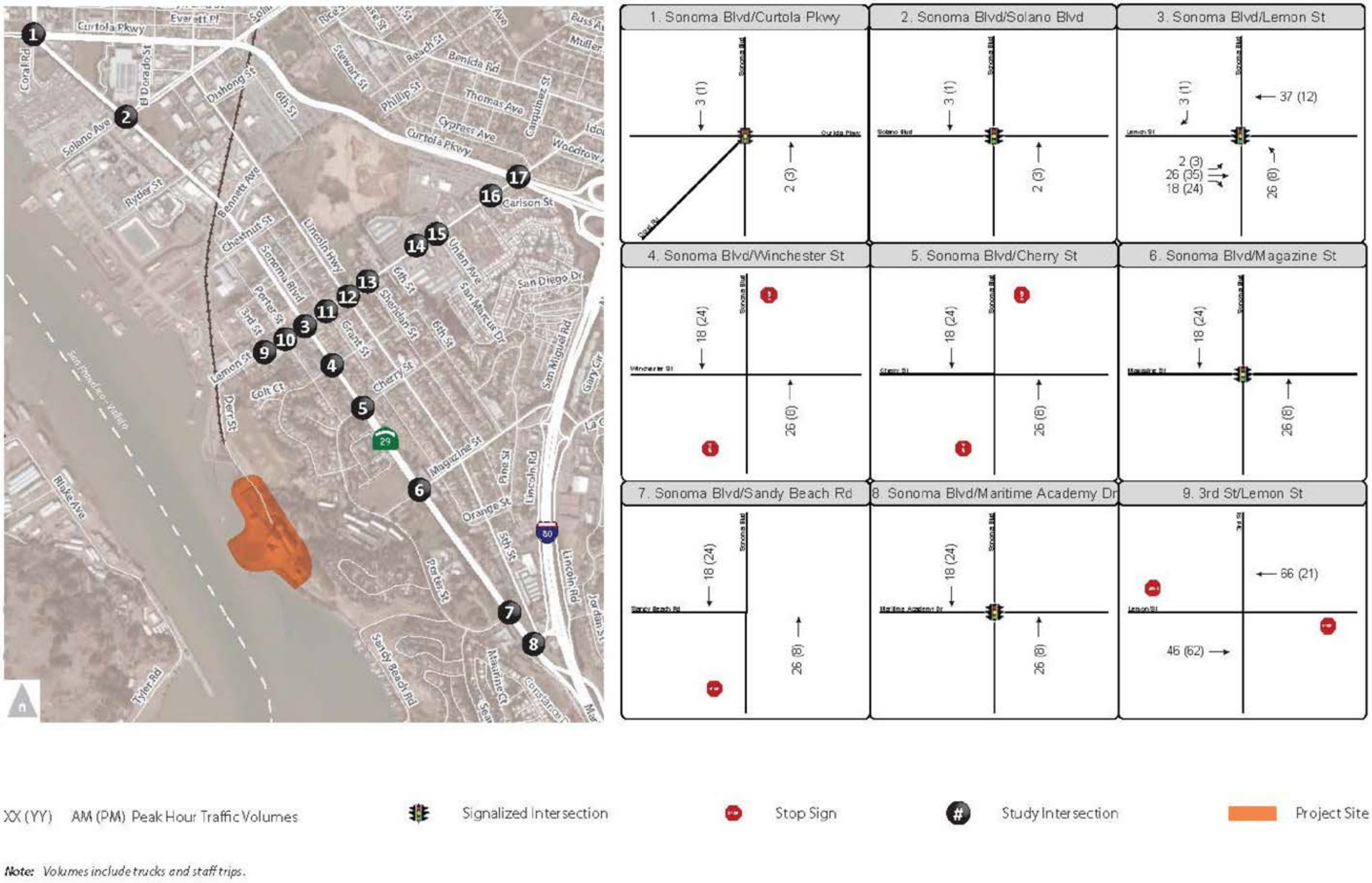

Note: *Volumes include trucks and staff trips.*

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SOURCE: Fehr and Peers 2014

FIGURE 3.12-6A

Combined Projects Project Trip Assignment

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Note: *Volumes include trucks and staff trips.*

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SOURCE: Fehr and Peers 2014

FIGURE 3.12-6B

Combined Projects Project Trip Assignment

VALLEJO MARINE TERMINAL AND ORCEM PROJECT DRAFT EIR

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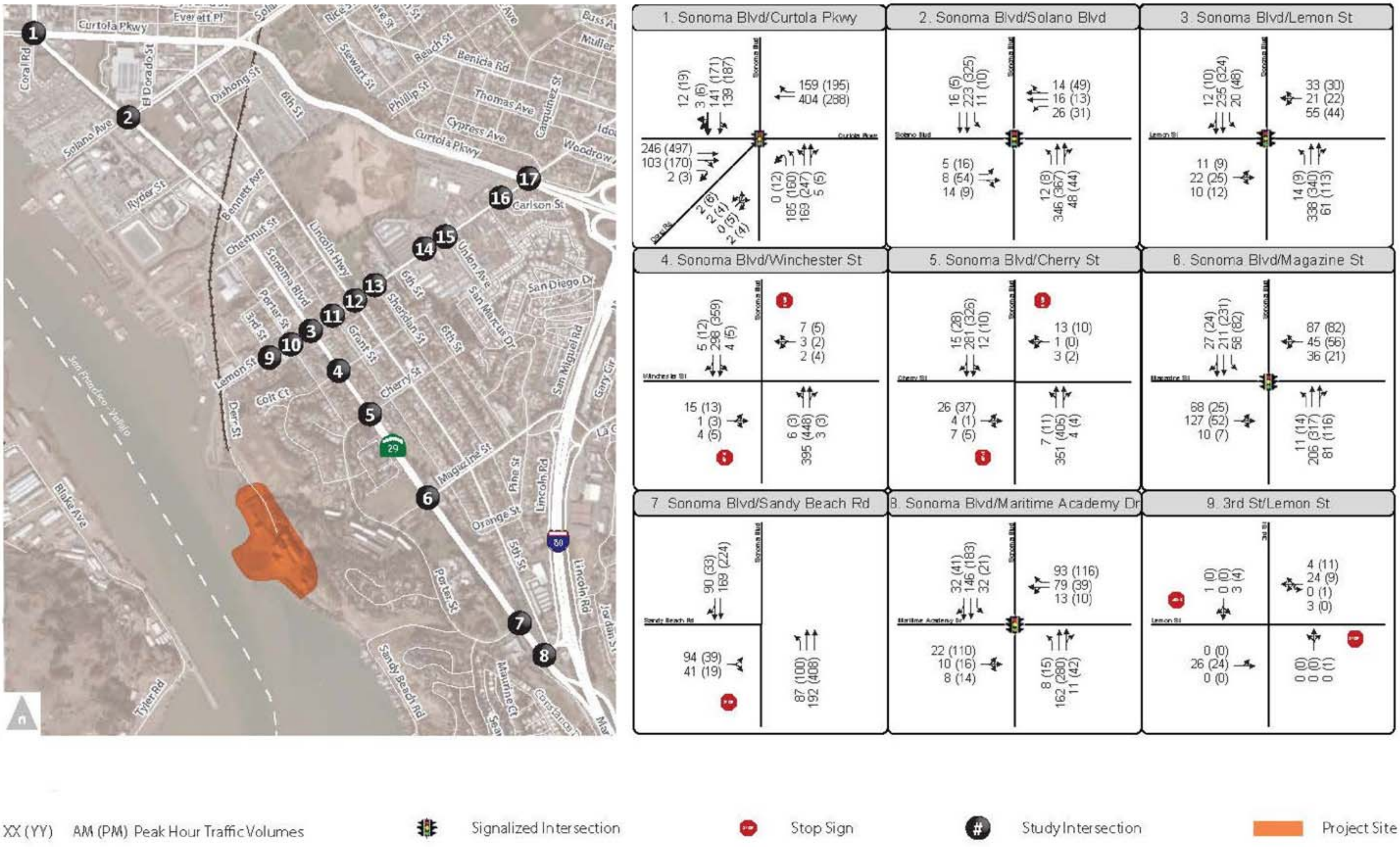

SOURCE: Fehr and Peers 2014

FIGURE 3.12-7A

Existing + Vallejo Marine Terminal Peak Hour Intersection Traffic Volumes

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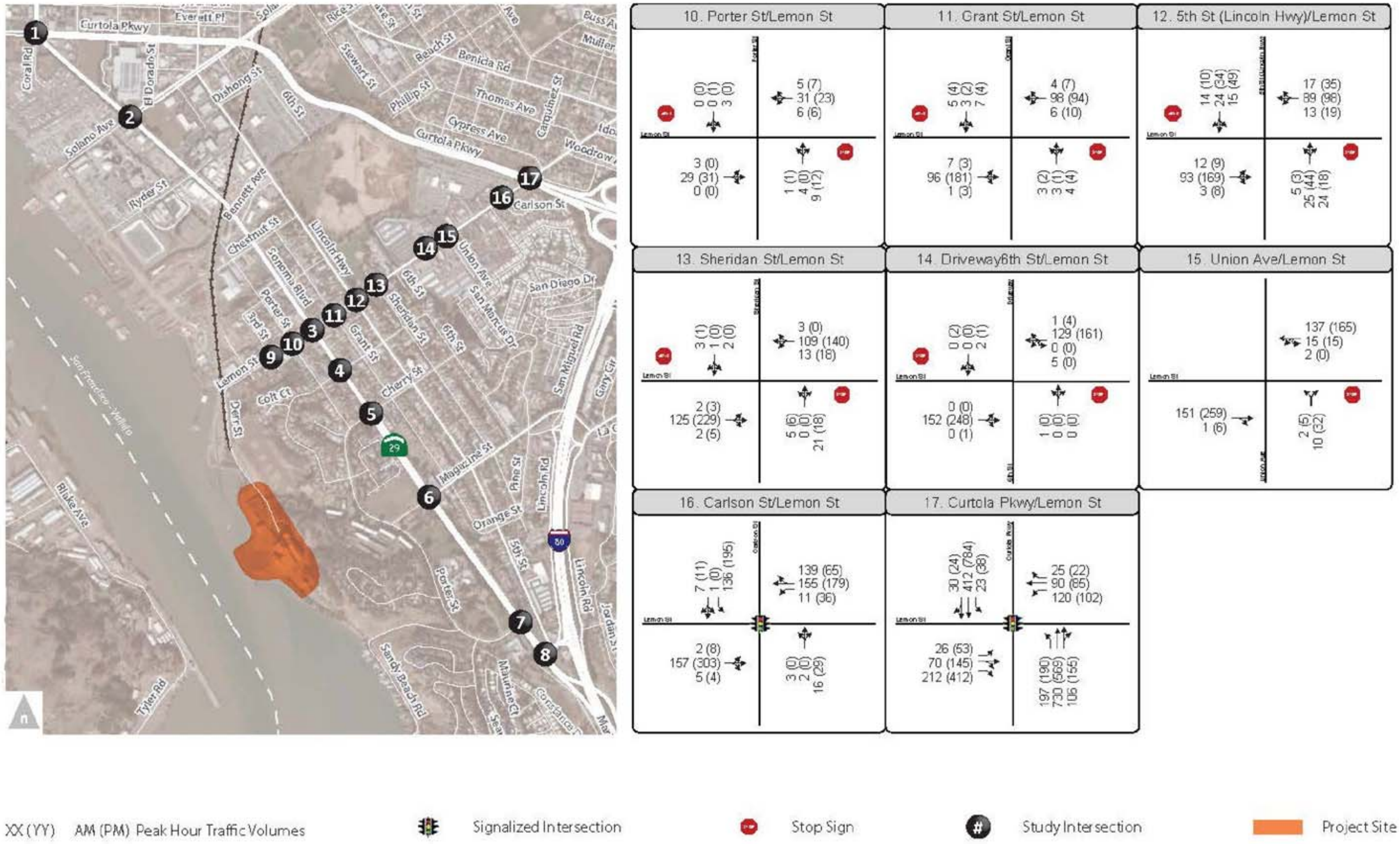

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SOURCE: Fehr and Peers 2014

FIGURE 3.12-7B

Existing + Vallejo Marine Terminal Peak Hour Intersection Traffic Volumes

VALLEJO MARINE TERMINAL AND ORCEM PROJECT DRAFT EIR

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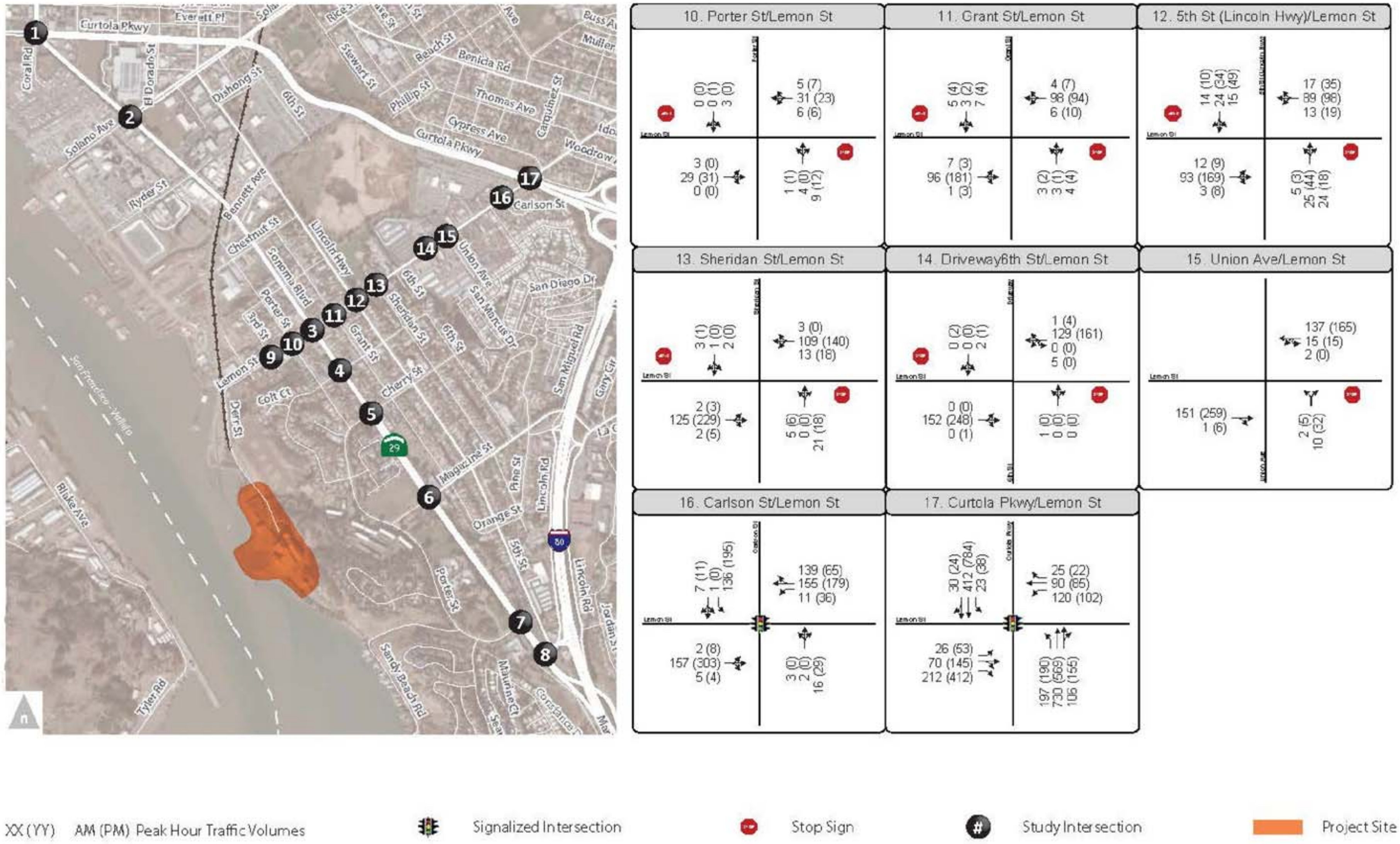

SOURCE: Fehr and Peers 2014

FIGURE 3.12-8A

Existing + Orcem Peak Hour Intersection Traffic Volumes

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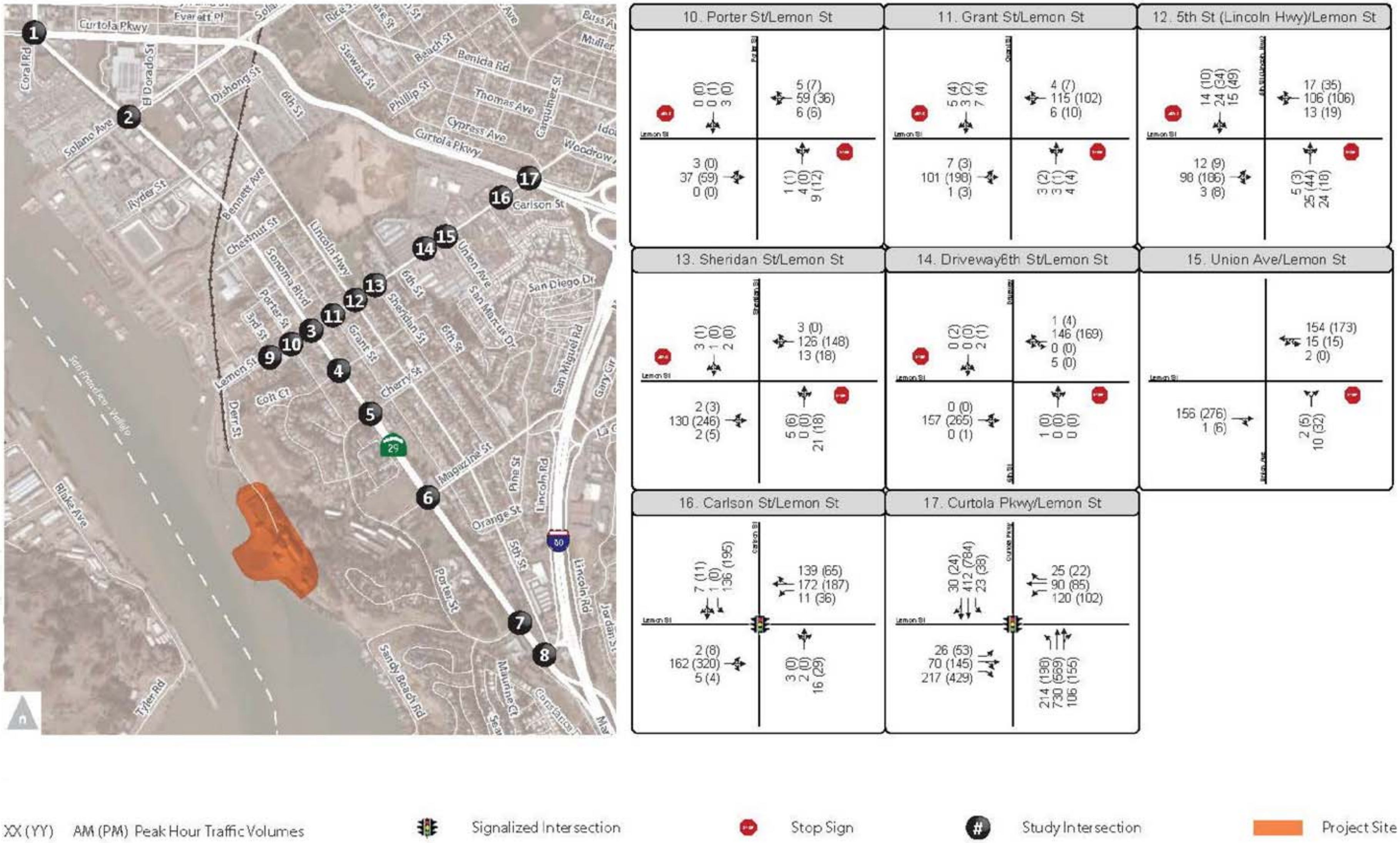

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SOURCE: Fehr and Peers 2014

FIGURE 3.12-8B

Existing + Orcem Peak Hour Intersection Traffic Volumes

VALLEJO MARINE TERMINAL AND ORCEM PROJECT DRAFT EIR

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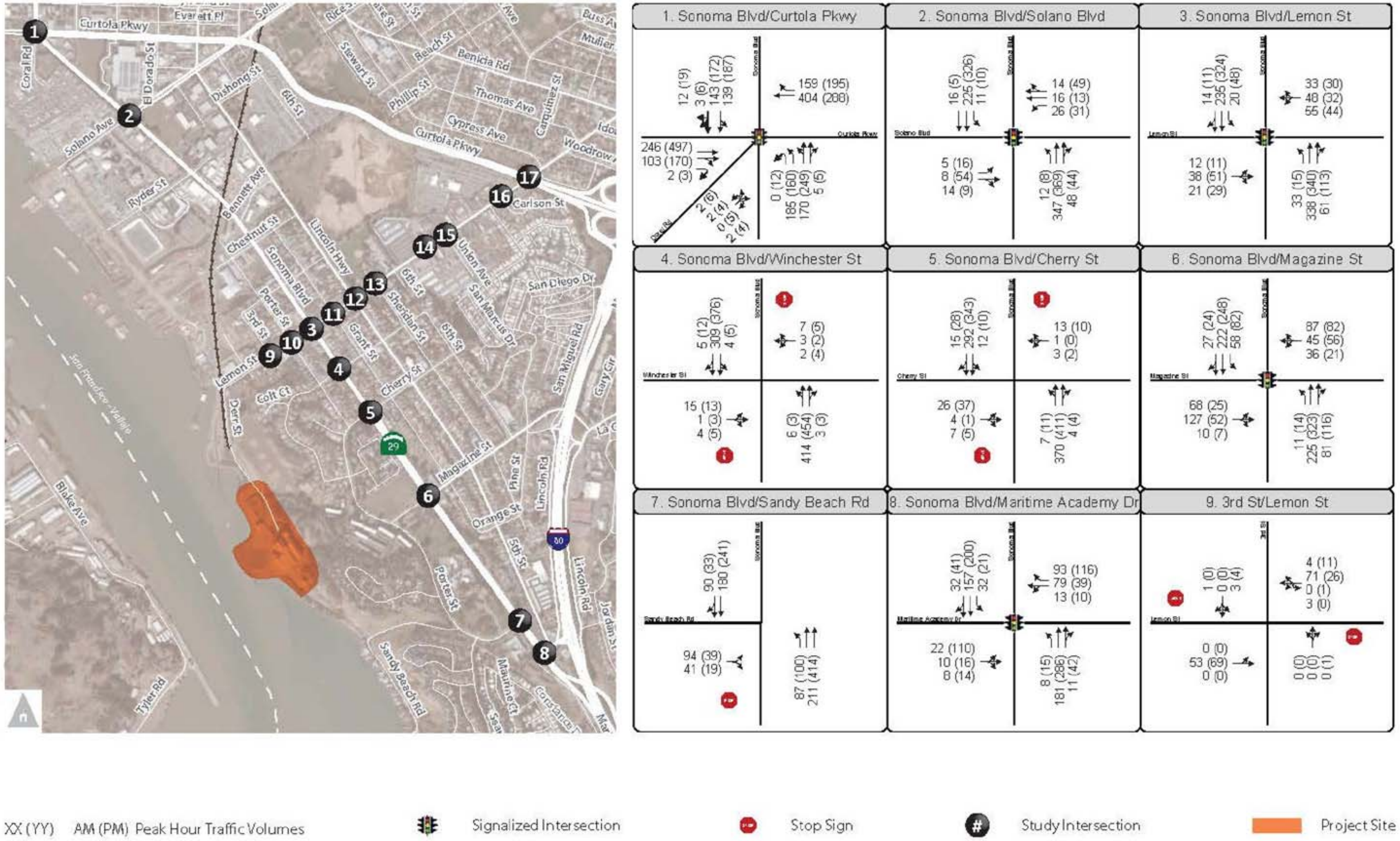

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SOURCE: Fehr and Peers 2014

FIGURE 3.12-9A

Existing + Combined Project Peak Hour Intersection Traffic Volumes

VALLEJO MARINE TERMINAL AND ORCEM PROJECT DRAFT EIR

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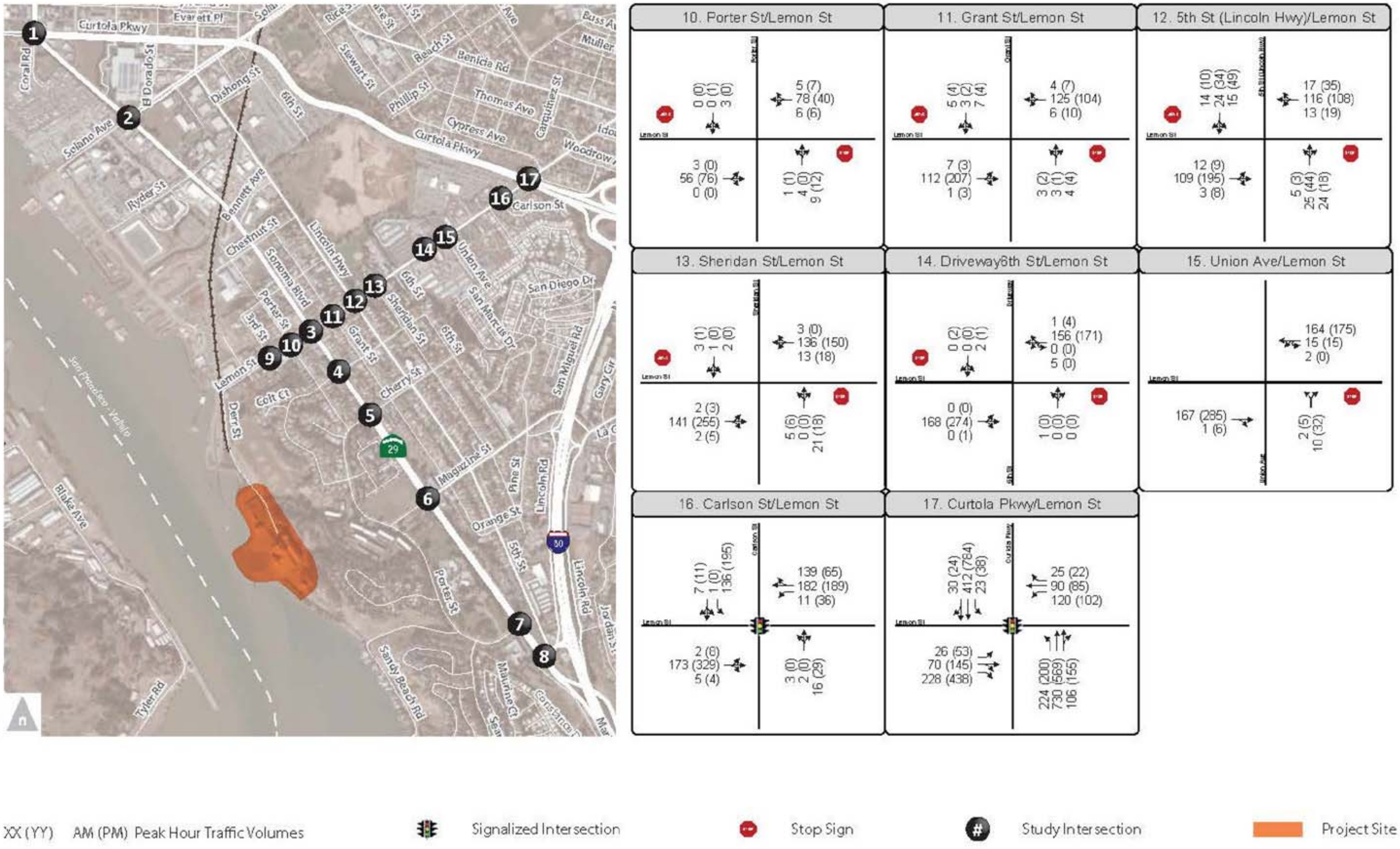

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SOURCE: Fehr and Peers 2014

FIGURE 3.12-9B

Existing + Combined Project Peak Hour Intersection Traffic Volumes

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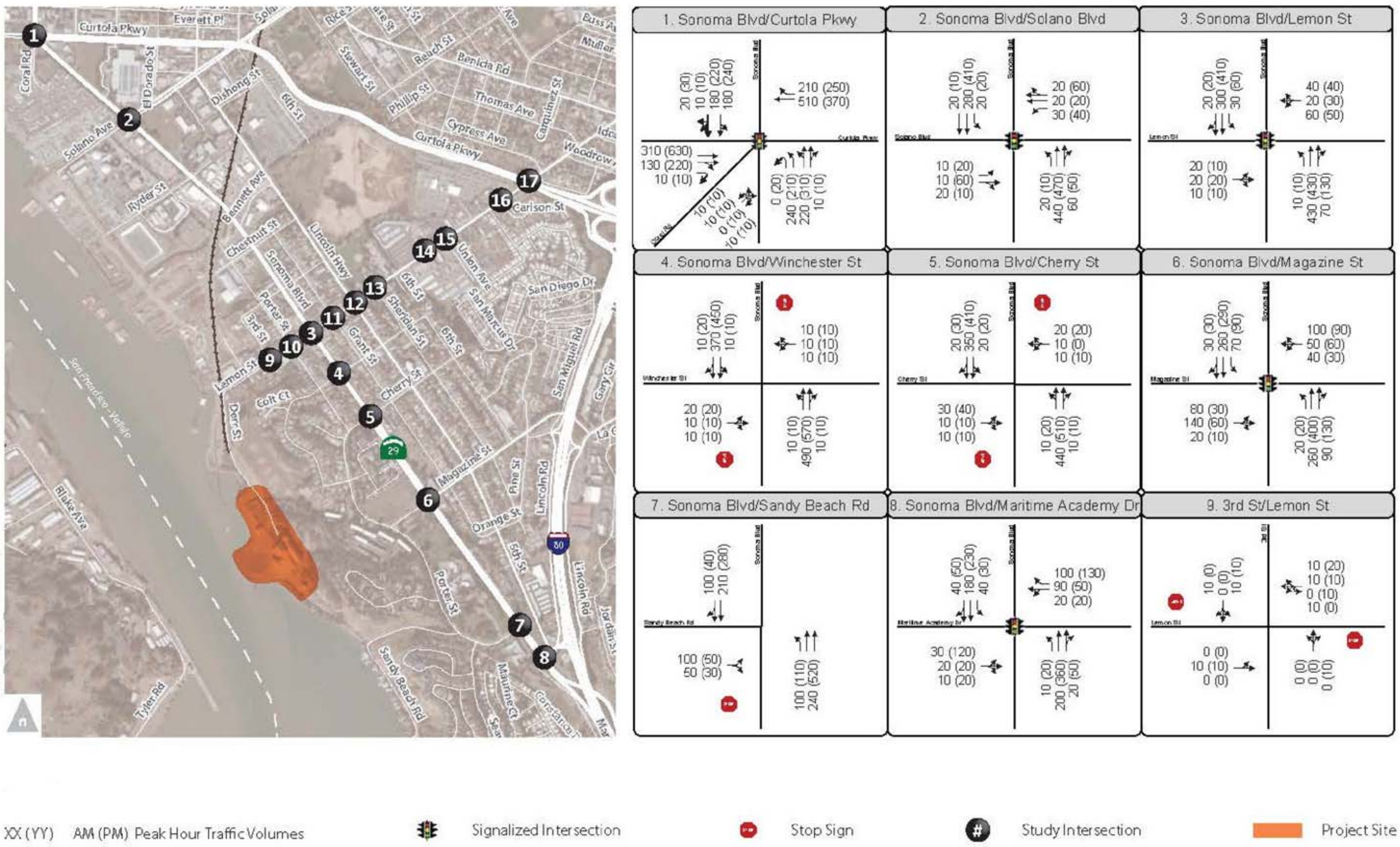

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SOURCE: Fehr and Peers 2014

FIGURE 3.12-10A

Cumulative (2040) No Project Peak Hour Intersection Traffic Volumes

VALLEJO MARINE TERMINAL AND ORCEM PROJECT DRAFT EIR

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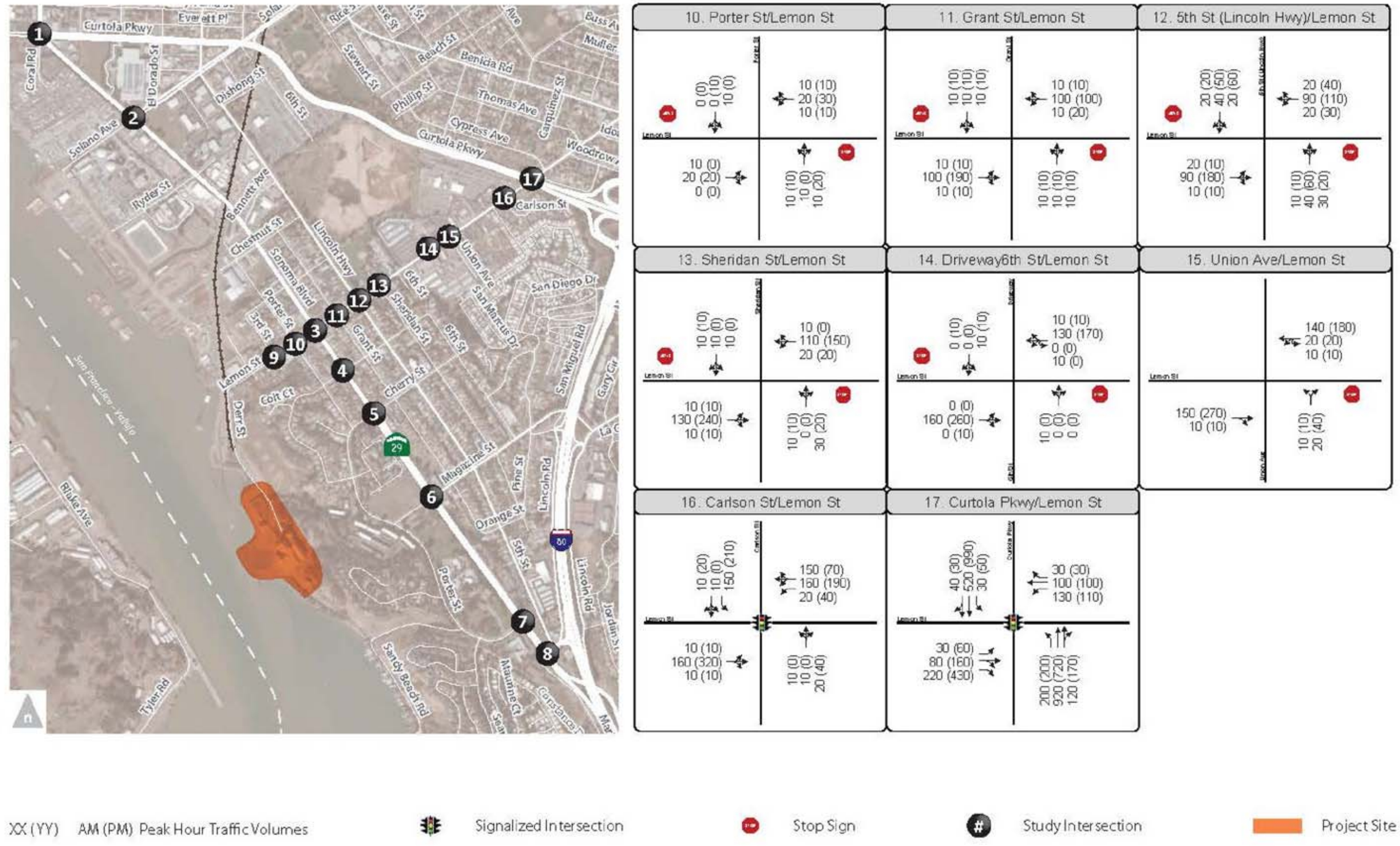

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SOURCE: Fehr and Peers 2014

FIGURE 3.12-10B

Cumulative (2040) No Project Peak Hour Intersection Traffic Volumes

VALLEJO MARINE TERMINAL AND ORCEM PROJECT DRAFT EIR

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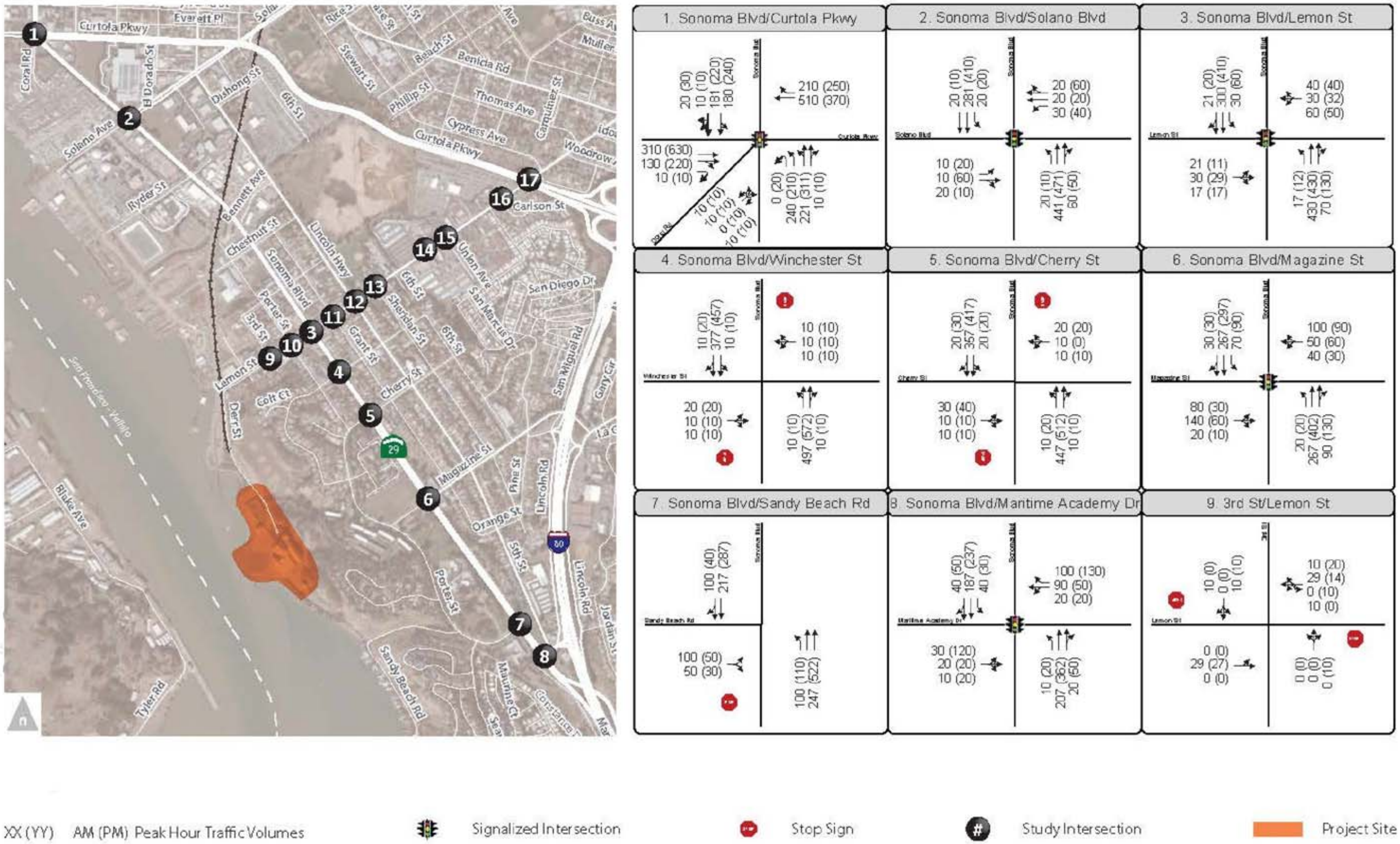

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SOURCE: Fehr and Peers 2014

FIGURE 3.12-11A

Cumulative (2040) + Vallejo MarineTerminal Peak Hour Intersection Traffic Volumes

VALLEJO MARINE TERMINAL AND ORCEM PROJECT DRAFT EIR

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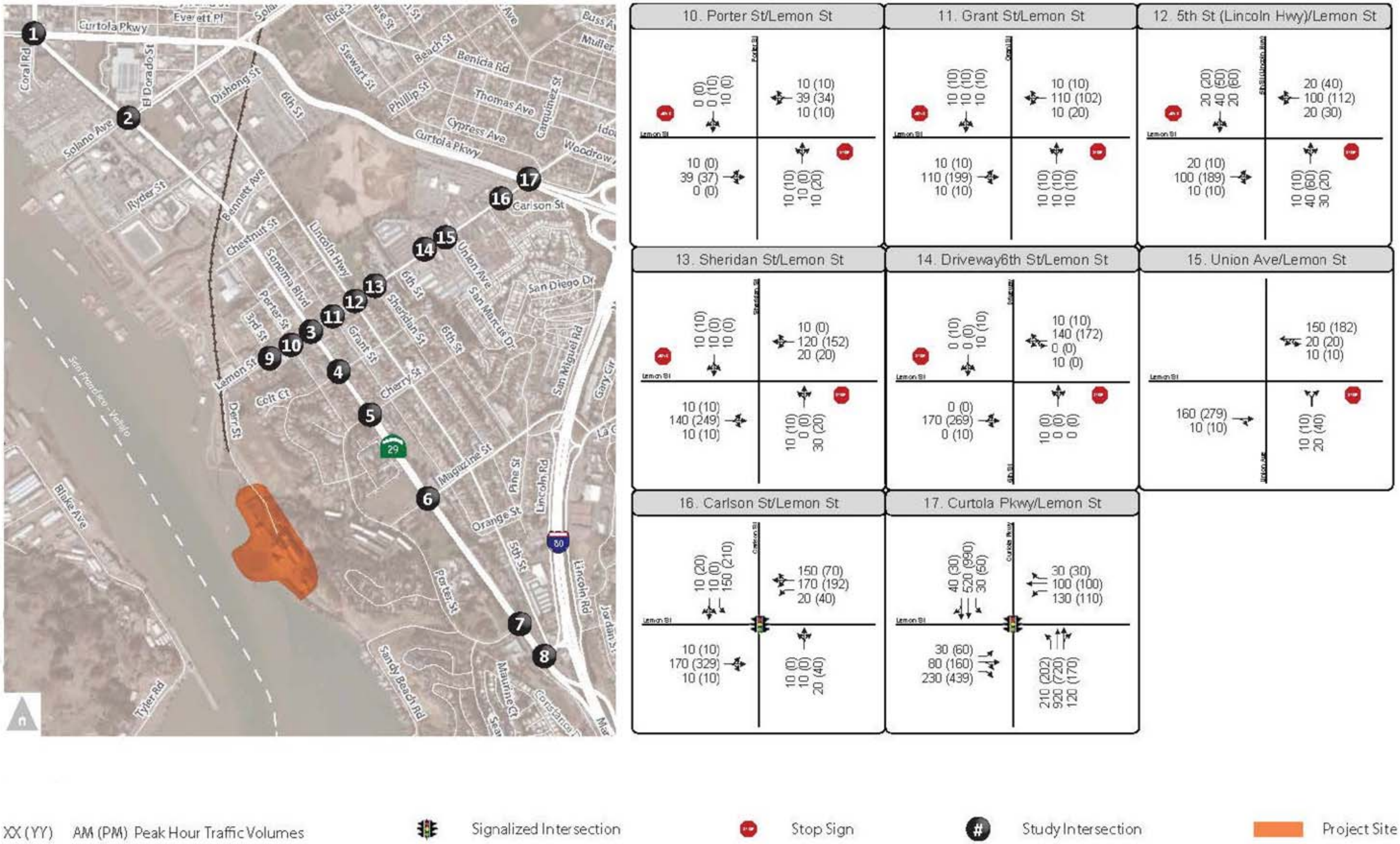

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SOURCE: Fehr and Peers 2014

FIGURE 3.12-11B

Cumulative (2040) + Vallejo MarineTerminal Peak Hour Intersection Traffic Volumes

VALLEJO MARINE TERMINAL AND ORCEM PROJECT DRAFT EIR

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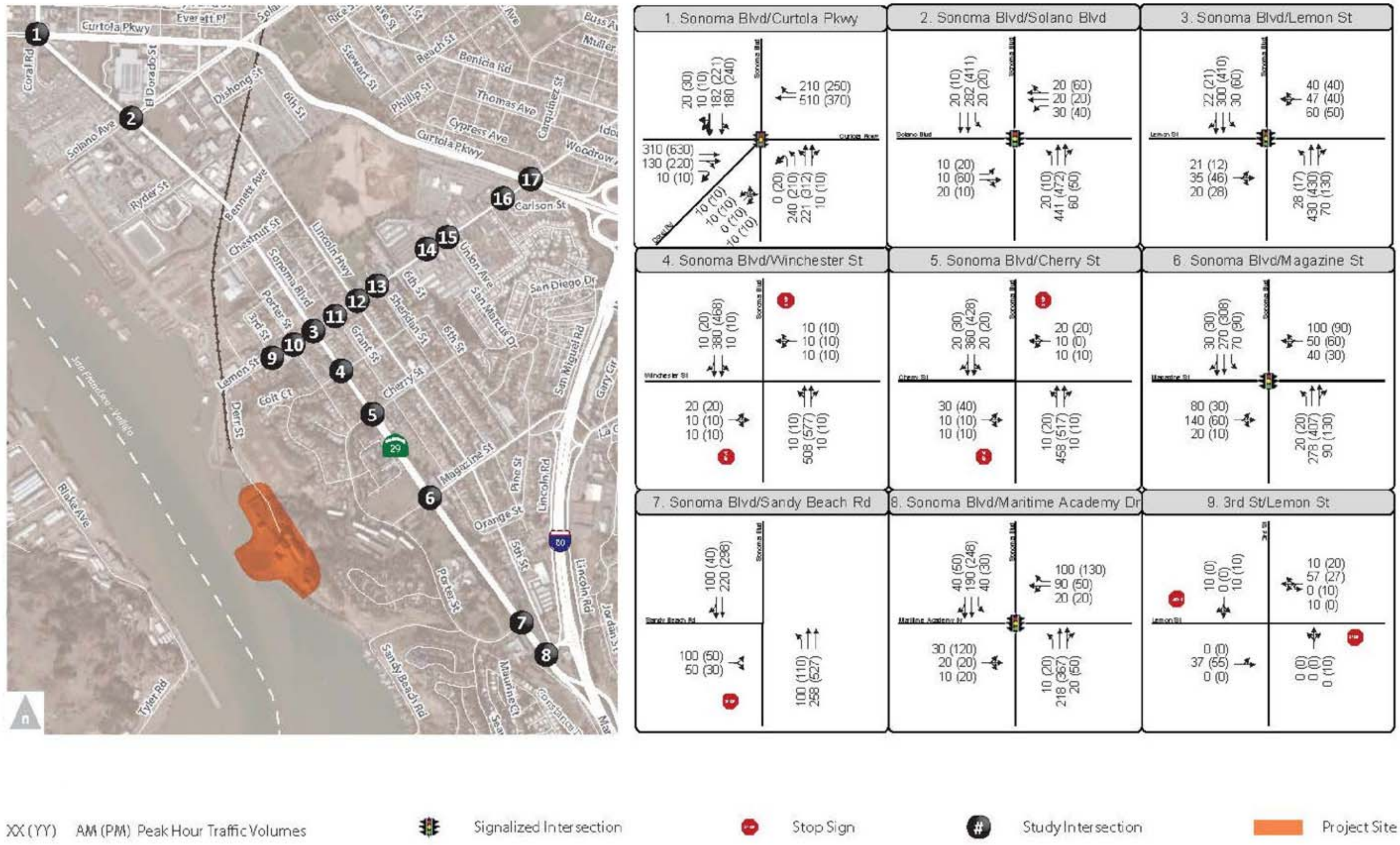

SOURCE: Fehr and Peers 2014

FIGURE 3.12-12A

Cumulative (2040) + Orcem Peak Hour Intersection Traffic Volumes

VALLEJO MARINE TERMINAL AND ORCEM PROJECT DRAFT EIR

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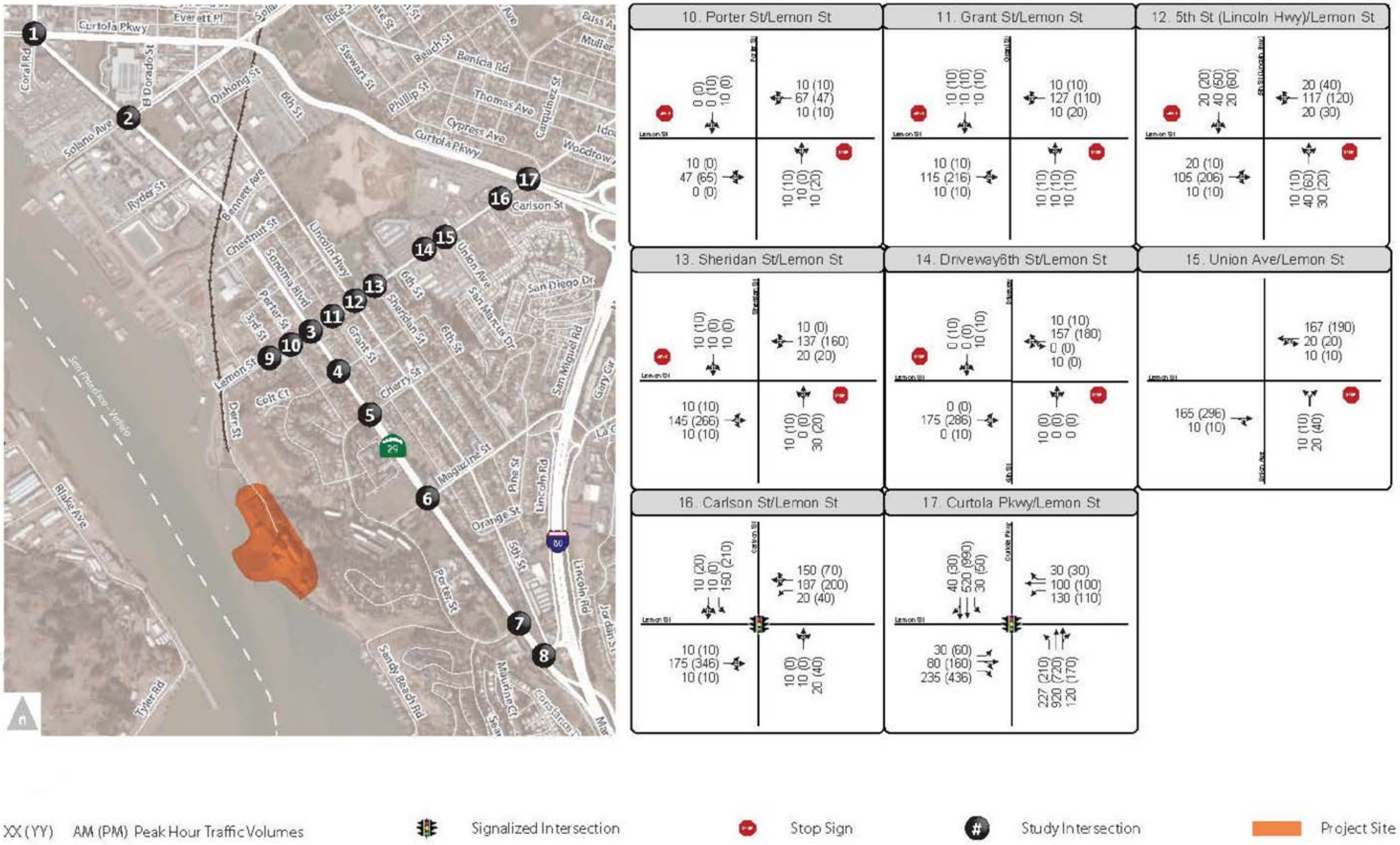

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SOURCE: Fehr and Peers 2014

FIGURE 3.12-12B

Cumulative (2040) + Orcem Peak Hour Intersection Traffic Volumes

VALLEJO MARINE TERMINAL AND ORCEM PROJECT DRAFT EIR

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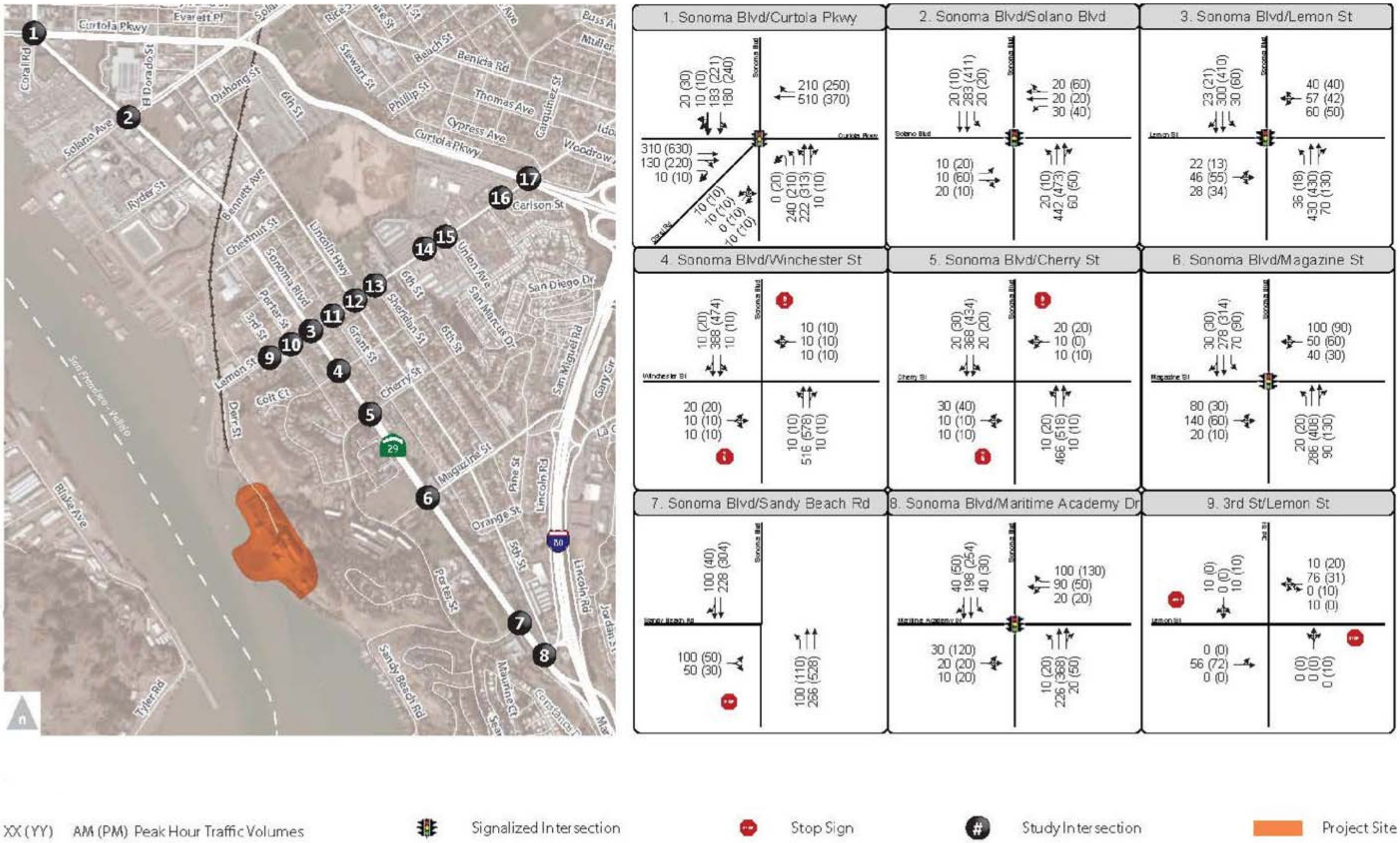

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SOURCE: Fehr and Peers 2014

FIGURE 3.12-13A

Cumulative (2040) + Combined Projects Peak Hour Intersection Traffic Volumes

VALLEJO MARINE TERMINAL AND ORCEM PROJECT DRAFT EIR

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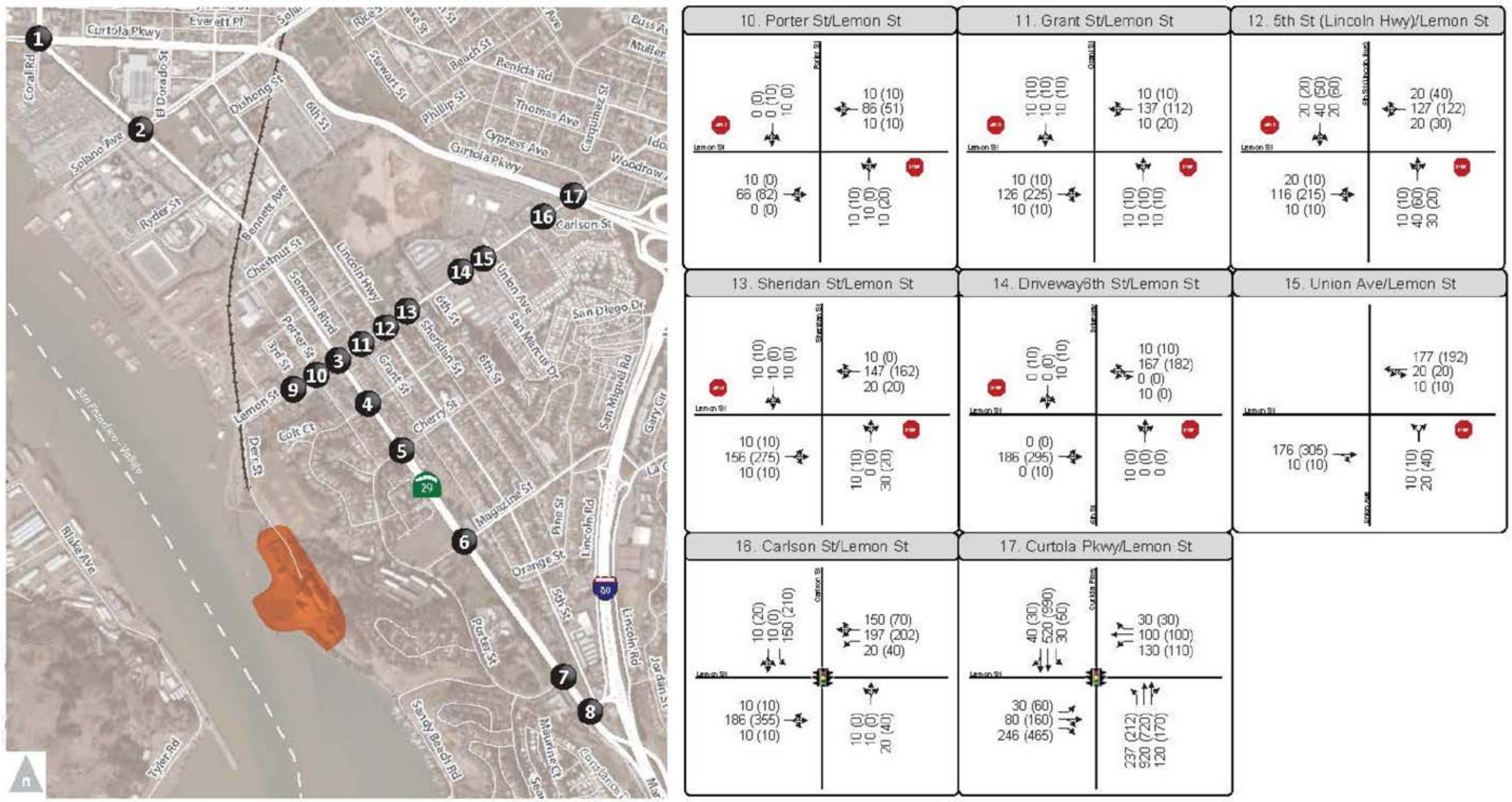

XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

Stop Sign

Study Intersection

Project Site

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SOURCE: Fehr and Peers 2014

FIGURE 3.12-13B

Cumulative (2040) + Combined Projects Peak Hour Intersection Traffic Volumes

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3.13 UTILITIES AND SERVICE SYSTEMS

This section analyzes the potential impacts of the Vallejo Marine Terminal (VMT) and Orcem project (proposed project) with respect to utilities and service systems and recommends mitigation measures where necessary to reduce or avoid significant impacts.

3.13.1 Regulatory Setting

Federal

Federal Clean Water Act of 1987

The Clean Water Act is the primary federal law that protects our nation’s waters, including lakes, rivers, aquifers, and coastal areas. Section 401 of the Clean Water Act requires that any applicant for a federal permit to conduct any activity, including the construction or operation of a facility that may result in the discharge of any pollutant, must obtain certification from the state.

Section 303 of the Clean Water Act requires states to identify surface waters that have been impaired. Under Section 303(d), states, territories, and authorized tribes are required to develop a list of water quality segments that do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution control technology. Section 404 of the Clean Water Act established a permit program to regulate the discharge of dredged material into waters of the United States.

National Pollution Discharge Elimination System

Section 402 of the Clean Water Act established the National Pollutant Discharge Elimination System (NPDES) to regulate the discharge of pollutants from point sources. The U.S. Environmental Protection Agency (EPA) has authorized the State of California to administer its NPDES permitting program. The NPDES permitting program prohibits the unauthorized discharge of pollutants from a point source (pipe, ditch, well, etc.) to U.S. waters. The permitting program addresses municipal, commercial, and industrial wastewater discharges and discharges from large animal feeding operations. Permittees must verify compliance with permit requirements by monitoring their effluent, maintaining records, and filing periodic reports. The program is administered at the local level by the Regional Water Quality Control Boards (RWQCBs).

Resource Recovery and Conservation Act of 1976

The Resource Conservation and Recovery Act (RCRA; 42 U.S.C. 6901 et seq. (1976)) gives the EPA the authority to control hazardous waste from “cradle to grave.” This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of nonhazardous solid wastes. The 1986 amendments to RCRA enabled the EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances.

The federal Hazardous and Solid Waste Amendments are the 1984 amendments to RCRA that focus on waste minimization and phasing out land disposal of hazardous waste as well as corrective action for releases. Some of the other mandates of this law include increased enforcement authority for the EPA, more stringent hazardous waste management standards, and a comprehensive underground storage tank program.

State

State Water Resources Control Board

The State Water Resources Control Board (SWRCB) preserves, enhances, and restores the quality of California's water resources, and ensures the proper allocation and efficient use for the benefit of present and future generations. Wastewater generators must obtain a permit to discharge their wastewater. Pursuant to the federal Clean Water Act and California's Porter–Cologne Water Quality Control Act, the SWRCB regulates wastewater discharges to surface waters through our NPDES program. Some wastewater discharges are exempt from federal NPDES requirements, but California law may still apply. Under California law, the SWRCB requires Waste Discharge Requirements for some discharges in addition to those subject to NPDES permits. Permits contain specific requirements that limit the pollutants in discharges. They also require dischargers to monitor their wastewater to ensure that it meets all requirements. Wastewater dischargers must maintain their treatment facilities, and treatment plant operators must be certified. The SWRCB routinely inspects treatment facilities and strictly enforce permit requirements.

California Senate Bills 221 and 610

Two articles of legislation were passed that address the provision of water, Senate Bill (SB) 221 (codified at California Government Code Section 66473.7) and SB 610 (codified at California Water Code, Section 10910 et seq.). Both of these bills place requirements on individual projects and require cities and counties to consider water supplies and demands for a proposed project.

Water Code Section 10910 requires that cities and counties include a water supply assessment in the environmental impact report (EIR) for projects specified in California Water Code Section 10912. These include, among others, residential projects of more than 500 units, shopping centers of more than 500,000 square feet, and industrial facilities with more than 650,000 square feet of floor area. California Government Code Section 66473.7 requires the City of Vallejo (City) to verify that there is a sufficient water supply as a condition of approval for residential subdivisions of 500 or more dwelling units and would include significantly less than 650,000 square feet of industrial floor area. Proof of a sufficient supply of water is not required for the proposed project since it does not include a residential component.

California Senate Bill 7

SB 7 (SB X7-7) was enacted in November 2009 to require all water suppliers to increase water-use efficiency. The legislation sets an overall goal of reducing per capita urban water use by 20% by December 31, 2020 (California Water Code Section 10608.20). In order to reach this goal, SB X7-7 requires each urban retail water supplier to report progress in meeting water-use targets (California Water Code Section 10608.40). The law also requires wholesale water suppliers to support their retail member agencies' efforts to comply with SB X7-7 through a combination of regionally and locally administered active and passive water conservation measures, programs, and policies, as well as the use of recycled water.

California Water Code

California's Porter–Cologne Water Quality Control Act (1969), which became Division 7 (Water Quality) of the California Water Code, establishes the responsibilities and authorities of the nine RWQCBs and the SWRCB. Among other things, it directs each RWQCB to formulate and adopt a water quality control plan—known as a basin plan—for all areas within the region. The water quality objectives used for this study are primarily those set forth in the Basin Plan (San Francisco Region 2) adopted by the RWQCB. The Basin Plan defines existing and potential beneficial uses and water quality objectives for coastal waters, groundwater, surface waters, imported surface waters, and reclaimed waters in the basin (RWQCB 2015).

State Agency Model Integrated Waste Management Act of 1999

Assembly Bill (AB 75) was passed in 1999, and the State Agency Model Integrated Waste Management Act (Chapter 764, Statutes of 1999, Strom-Martin) took effect on January 1, 2000. The State Agency Model Integrated Waste Management Act mandated that state agencies develop and implement an integrated waste management plan. The act also mandated that community service districts providing solid waste services report disposal and diversion information to the city, county, or regional agency in which the community service district is located. Provisions of the act require all state agencies and large state facilities to divert at least 50% of solid waste from landfills after 2004 and that each state agency and large facility submit an annual report to the California Department of Resources Recycling and Recovery (CalRecycle) summarizing its yearly progress in implementing waste diversion programs.

California Integrated Waste Management Act

Enacted by AB 939 and signed into law in 1990, the California Integrated Waste Management Act established an integrated system of solid waste management whereby each city and county is required to develop and implement plans consistent with the mandated diversion rates of 25% by 1995 and 50% by 2000. In 2011, AB 341 was passed, which sets a statewide policy goal that by the year 2020, not less than 75% of solid waste generated be source reduced, recycled, or composted (California Public Resources Code, Section 41700).

California Energy Commission

The California Energy Commission (CEC) is the state's primary energy policy and planning agency. Responsibilities of the CEC include, but are not limited to, forecasting future energy needs and keeping historical energy data, licensing thermal power plants 50 megawatts or larger, promoting energy efficiency, supporting renewable energy by providing market support, and planning for and directing state response to energy emergencies. SB 1389 requires the CEC to conduct "assessments and forecasts of all aspects of energy industry supply, production, transportation, delivery and distribution, demand, and prices." The CEC reports the results of these assessments and forecasts every 2 years to the governor, the legislature, and the California public in the Integrated Energy Policy Report.

Title 20 and Title 24, California Code of Regulations

New buildings constructed in California must comply with the standards contained in Title 20, Public Utilities and Energy, and Title 24, Building Standards Code, of the California Code of Regulations (CCR). Title 20 contains standards ranging from power plant procedures and siting to energy efficiency standards for appliances to ensuring reliable energy sources are provided and diversified through energy efficiency and renewable energy resources. Title 24 contains energy efficiency standards for residential and nonresidential buildings based on a state mandate to reduce California's energy demand. Specifically, Title 24 addresses a number of energy efficiency measures that impact energy used for lighting, water heating, heating, and air conditioning, including the energy impact of the building envelope such as windows, doors, skylights, wall/floor/ceiling assemblies, attics, and roofs.

The CEC adopted the 2005 changes to the Building and Energy Efficiency Standards to address California's energy crisis and reduce energy bills, increase energy delivery system reliability, and contribute to an improved economic condition for the state. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. The current standards went into effect on October 1, 2005.

CEQA Guidelines, Appendix F

Appendix F of the California Environmental Quality Act (CEQA) Guidelines contains energy conservation measures that promote the efficient use of energy for projects. In order to ensure that energy impacts are considered in project decisions, CEQA requires that EIRs include a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy. The goal outlined in Appendix F of the CEQA Guidelines is to conserve energy through the wise and efficient use of energy. The means of achieving this goal include the following:

- Decreasing the overall per capita energy consumption.
- Decreasing reliance on natural gas and oil.
- Increasing reliance on renewable energy sources.

Local

City of Vallejo General Plan

The City's General Plan (City of Vallejo 1999) includes the following goals and policies related to utilities and service systems:

Other Services Goal: To provide an efficient and financially sound system of urban services to protect the health, safety and general welfare of Vallejo area residents.

- *Policy 1:* Encourage infilling; that is, development within the urban area already served by sewer, drainage and water lines, and streets.
- *Policy 2:* New development should bear the cost to extend or upgrade public services and/or provide or upgrade public facilities to serve the new development proportionately to the demand generated by the new development. It is recognized that in some instances the City may also participate in the cost to extend public services and/or public facilities to areas in which such services/facilities do not currently exist when the City makes a specific finding that such an extension will benefit the community.
- *Policy 6:* Sanitary and Storm Water Systems:
    a. The number of new catch basins with debris traps should be minimized; drainage into wetlands or other sensitive areas should be first channeled through a sedimentation basin.

Water Resources Goal: To protect the city's water resources against pollution and wasteful use so that it will be available for the city's future needs.

- *Policy 3:* The City should actively encourage conservation of water through reduced per capita consumption.

Energy Resources Goal: To reduce the City's dependence on non-renewable energy resources through conservation and development of renewable energy sources.

- *Policy 3:* Encourage participation in PG&E programs for reducing energy consumption.

City of Vallejo 2005 Urban Water Management Plan

Urban water management plans (UWMPs) are prepared by California's urban water suppliers to support their long-term resource planning and ensure adequate water suppliers are available to meet existing and future water demands. Urban water purveyors are required to prepare and update a UWMP every 5 years. The UWMPs address water supply, treatment, reclamation, and water conservation, and include a water shortage contingency plan.

The City of Vallejo's 2005 UWMP, adopted in February 2006, is the most recent UWMP for the City. The 2005 UWMP estimates water demands through the year 2025 based on unit water factors, housing and employment projections for the City, and projections for unaccounted-for-water. The total projected water demand for the City of Vallejo Water System in 2025 is 24 million gallons per day (mgd) or 27,140 acre-feet per year (AFY). In addition to the City of Vallejo water system, the UWMP covers the small Vallejo Lakes system, wholesale customers, and other demands. With the inclusion of these other demands outside of the City of Vallejo, the total demand for 2025 is projected to be 35,610 AFY. These projections do not include proposed conservation measures that would help to reduce water demand (City of Vallejo 2006).

The UWMP also assesses the adequacy of the projected water supply to meet the projected demand under normal and dry water year conditions. The City's projected water supply for normal water years between 2010 and 2025 is 46,444 AFY. With a projected demand of 35,610 AFY in 2025, the projected supply would meet the service obligations with a 23% surplus in a normal water year. Similarly, in a single dry year, supplies would meet the demand with a 13% surplus in 2025. Under projected second and third dry year conditions, the water demands would be met by the supply; however, the demand would exceed 90% of the supply in 2025 and would therefore trigger a water shortage response (City of Vallejo 2006).

The City's UWMP includes a Water Shortage Contingency Plan that addresses the short-term or emergency water management practices required during a drought or other shortage conditions. It includes a five-stage response program that consists of specific prohibitions, regulations, fines, penalties, and a rate structure to encourage the appropriate level of conservation. Each stage and set of prohibitions are tied to a water use reduction goal (Stage 1= 0% reduction, Stage II=10%, Stage III=20%, Stage IV=35%, Stage V=up to and above 50%). Though all five stages have both voluntary and mandatory components, none can be considered a rationing program because they do not strictly limit water use (City of Vallejo 2006).

Sanitary Sewer Management Plan

The Vallejo Sanitation and Flood Control District (VSFCD) Sanitary Sewer Management Plan (SSMP) was adopted in December 2008 and certain sections have been updated since then. The goal of the SSMP is to reduce blockages and sanitary sewer overflow occurrences in the VSFCD collection system. The SSMP consists of 10 sections, including the sanitary sewer overflow response plan; fats, oils, and grease control program; legal authority; measures and activities; design and construction standards; capacity management and measurement program; and communication and public outreach (VSFCD 2008).

City of Vallejo Construction and Demolition Debris Recycling Ordinance

Chapter 7.53 of the City's Municipal Code, the Construction and Demolition Debris Recycling Ordinance, is intended to meet the goals of the California Integrated Waste Management Act of 1989 (AB 939). The goal is to divert, by recycling or reuse, 50% or more of the materials (by weight) and 75% of concrete and asphalt. The ordinance applies to all demolition projects and all construction or renovation projects with a valuation of $50,000 or higher or projects equal to or greater than 5,000 square feet.

3.13.2 Existing Conditions

Water

The City of Vallejo Water Division provides administrative, engineering, water treatment, and maintenance support for the City's potable water treatment and distribution. As of the 2005 UWMP, the City served approximately 37,800 water connections in the City and adjacent unincorporated portions of Solano County (City of Vallejo 2006).

The City uses surface water from five different sources: Solano Project Water, State Water Project, Vallejo Permit Water, Lakes Frey and Madigan, and Lake Curry. No groundwater sources are currently used for the City's water supply. The City utilizes the Fleming Hill water treatment plant (WTP) to treat water that is delivered from the Sacramento River Delta, Lake Berryessa, and Lake Curry. The maximum design flow rate of the Fleming Hill WTP is 42 mgd (City of Vallejo 2006).

As described earlier, the City's 2005 UWMP includes projections for water supply and demand through the year 2025. Based on the projections for normal and dry year conditions, the UWMP determines that the City would have adequate supply to meet the City's future water demand (City of Vallejo 2006).

Wastewater

VSFCD provides wastewater treatment, collection, and disposal of wastewater to the City of Vallejo and outlying areas. The current population served by the VSFCD is 125,731, which includes both Vallejo residents (121,055) and residents who live in the unincorporated areas within VSFCD's service area (4,676) (VSFCD 2008).

The wastewater collection system in Vallejo consists of a 370-mile network of pipes that carry wastewater from homes and businesses to the Ryder Street Wastewater Treatment Plant (WWTP). The pipes of the collection system range in diameter from 4 to 6 inches for lateral pipes to 12 to 54 inches for interceptor pipes.

In the project area, there is a 30-inch sanitary sewer line in Derr Street that splits into two separate lines as it enters the project site (a 24-inch line and 8-inch line). The 24-inch line extends along the waterfront and then into the area of the existing buildings on the site. The 8-inch line extends north from the site into the adjacent neighborhood. Wastewater in the pipes is conveyed by collection system pump stations that range in age and capacity.

During high rainfall events, stormwater enters the VSFCD wastewater collection network through cracks and fissures in the pipes, resulting in capacity overload of the system. This condition, in turn, has historically led to the release of untreated wastewater through manhole surcharges and overflows at pump stations. Many of these system overflows are not authorized by VSFCD's NPDES. The NPDES Permit is issued by the San Francisco RWQCB and limits the amount and type of effluent that can be released by sanitary sewer facilities.

All wastewater collected in the area served by VSFCD, is treated at the Ryder Street WWTP. The Ryder Street WWTP discharges treated wastewater through two export pipelines, the Mare Island Strait outfall and the Carquinez Strait outfall. Only secondary-treated wastewater can be discharged into Mare Island Strait, while both primary and secondary-treated wastewater can be discharged in the Carquinez Strait. The Ryder Street WWTP has a permitted dry weather capacity of 15.5 mgd. As of the 2005 UWMP, a total of 12.1 mgd of wastewater was being treated at the WWTP (City of Vallejo 2006). The short-term wet weather capacity of the Ryder Street WWTP is 60 mgd. During the rainy season, the Ryder Street WWTP has a capacity of 35 mgd for full secondary treatment and an additional 25 mgd for primary treatment.

During periods of high precipitation in the winter months, surplus flow is diverted to the Ryder Street Storage Basin when the Ryder Street WWTP's 60 mgd capacity has been exceeded. The Ryder Street WWTP does not experience capacity overloads during the dry season.

Water recycling is not currently performed by VSFCD facilities but is under evaluation. The VSFCD has recommended a recycled water program for the City that would require the construction of a treatment facility at the Ryder Street WWTP. However, there are no current plans to construct a transmission line and pumping station, which are needed to return treated wastewater to the water utility service area for distribution.

Stormwater

Stormwater is discussed in Section 3.8, Hydrology and Water Quality, of this document.

Solid Waste and Recycling

Recology Vallejo provides solid waste, recycling, and yard waste collection services in the City of Vallejo. Solid waste collected by Recology is transported to the Devlin Road Transfer Station, a regional facility operated by the Napa–Vallejo Waste Management Authority. Recyclable materials and green waste are sorted and sent to various facilities. Solid waste that cannot be recycled is sent to the Keller Canyon Landfill, located at 901 Bailey Road in Pittsburg, Contra Costa County. The Keller Canyon Landfill has a permitted capacity of 75,018,280 cubic yards and a remaining capacity of 63,408,410 cubic yards. Currently, the landfill receives 3,500 tons of garbage a day, and the anticipated closing date of the landfill is December 31, 2030 (CalRecycle 2014).

Energy

Pacific Gas and Electric Company (PG&E) provides electricity and natural gas service to customers in the City. PG&E charges connection and user fees for all new development, in addition to sliding rates for electrical and natural gas service based on use. These services are currently available at the project site.

3.13.3 Thresholds of Significance

The following criteria, included in Appendix F and Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.), will be used to determine the significance of potential utilities and service systems impacts. Impacts to utilities and service systems would be significant if the proposed project would:

A) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board.

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

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

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

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

F) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs.

G) Comply with federal, state, and local statutes and regulations related to solid waste.

H) Increase the demand of energy resources to exceed the available supply or cause a need for new or expanded facilities.

I) Result in a wasteful, inefficient, or unnecessary use of energy.

3.13.4 Impact Discussion

A) Would the project exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

VMT and Orcem Project Analysis

No process water would be generated from either the VMT or Orcem components of the project; these project components would require only domestic service for bathroom and incidental office demands. The VMT project component is projected to generate a maximum of 1,800 gallons of wastewater per day, and the Orcem project component is projected to generate a maximum of 600 gallons of wastewater per day, for a total maximum of 2,400 gallons of wastewater generated on the project site per day. All wastewater collected from the project site would be treated at the Ryder Street WWTP, which is a VSFCD facility. The Ryder Street WWTP discharges treated wastewater through two export pipelines: the Mare Island Strait outfall and the Carquinez Strait outfall. Only secondary-treated wastewater can be discharged into Mare Island Strait, while both primary and secondary-treated wastewater can be discharged in the Carquinez Strait. VSFCD and the Ryder Street WWTP are subject to the waste discharge requirements set forth in RWQCB Order No. R2-2012-0017 (NPDES No. CA0037699), which was adopted on February 8, 2012 and expires on March 31, 2017. Since the proposed project would be served by the Ryder Street WWTP, which operates in compliance with the treatment and discharge requirements of the San Francisco Bay RWQCB, impacts would be **less than significant**.

Off-Site Improvements

The proposed project includes two off-site improvements (public access improvements and removal of existing deteriorated docks) that would take place at the City of Vallejo Municipal Marina located approximately 2 miles north of the project site. These improvements would not generate wastewater and would therefore result in **no impact** related to wastewater treatment requirements.

B) Would the project 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?

VMT and Orcem Project Analysis

Water

The VMT project component would require water primarily for office uses and dust suppression during operations. During vessel loading/unloading operations, there could be up to 40 individuals working on the site at a given time, operating on a 24-hour basis in multiple shifts. During regular daily operations, it is expected that up to 25 individuals would be engaged in cargo loading and offloading, site maintenance operations, and administrative duties. Given the projected number of employees, VMT is projected to require 1,800 gallons of domestic water usage per day, or roughly 650,000 gallons per year, provided by the City of Vallejo (based on an average of 15 gallons per person per shift per day).

In addition, VMT operations may require up to 4,300,000 gallons of water annually (12,000 gallons per day maximum) for dust control purposes, also provided by the City of Vallejo. Water trucks may be required to apply 3,000 gallons per episode to stockpiled cargoes on site, as well as to the on-site road network for dust suppression, as many as three times per day (9,000 gallons per day maximum). This need could exist every day of the year, totaling 3,285,000 gallons annually. Additionally, misting operations on cargo-handling equipment (front-end loaders, hoppers, conveyors, etc.) may require an additional maximum of 3,000 gallons of water daily for dust suppression, for a potential 312 operating days per year, a total capacity of 936,000 gallons annually. These needs are in addition to the domestic water needs of employees mentioned above. Therefore, the total estimated water demand from VMT operations is estimated at a maximum of 4,950,000 gallons per year (13,800 per day).

Orcem operations would require water to support the manufacturing process proposed on the site. The following is a description of the Orcem water requirements:

- *Water Added to the GBFS to Enable the Grinding Process.* The proposed vertical roller mill operates most efficiently when the material (granulated blast furnace slag (GBFS)) is at 6% moisture when it reaches the grinding table. GBFS can be received at the project site from a ship at anywhere from 5% to 12% moisture content. In addition, the material can rest in the stockpile for several weeks before being milled and can dry out to as low as 3% moisture content. Therefore, the water demand from the manufacturing process to enable a steady 6% moisture GBFS at the mill table, would vary depending on the nature of the material leaving the stockpile. The maximum amount of water needed to mill would be 1,321 gallons per hour (as shown in Table 3-13.1), assuming a worst case of 3% moisture content.
- *Water Added to the Cooling Circuit for Equipment.* The proposed cooling water circuit for the mill equipment is a closed-circuit system. Up to 10 gallons of water per hour would be required to replenish evaporative losses (as shown in Table 3.13-1).
- *Water to Spray the Raw Materials Stockpiles (GBFS).* As described above, the GBFS would arrive on the site at moisture contents between 5% and 12%. In this state, the material on the surface of the stockpiles would be bound together as a cohesive material. As the GBFS dries in the sun and wind, it would form a crust and continue to encapsulate the stockpile. However, once the material is disturbed by the loader to remove it from the stockpile and the crust is broken, it would have a tendency to form migrant dust. In order to prevent this, the stockpile would be sprayed with water to eliminate the tendency to create dust. As described in the Storm Water Management Plan, stormwater runoff would be stored in underground tanks and used to spray the stockpiles. It is expected that this method of spraying would be carried out during the rainy season from October through April. For the remaining months of the year—May through September—any spraying would be carried out using mains water. It is estimated that spraying would take place every day for approximately 20 weeks per year, requiring a maximum of 2,400 gallons of water per day (300 gallons per hour for 8 hours per day).
- *Water for Human Consumption.* In addition to the manufacturing processes that would require water, Orcem would require water for staff working on the site. Based on the assumption of having up to 16 staff on the site at any given time and a total of 40 total full time jobs, the estimated water consumption would be 600 gallons per day (again based on an average of 15 gallons per person per day operating in multiple shifts).

Based on the estimated water demands described previously, and as shown in Table 3.13-1, Orcem is expected to require up to 1,656 gallons of water per hour or 32,282 gallons per day. While the plant would operate on a 24-hour basis, since not all processes requiring water would occur every day of the year, the annual water demand was determined based on the maximum number of days and hours when water would be required. As shown in Table 3.13-1, a total maximum of 9,922,840 gallons per year would be required for Orcem's operations, assuming that no recycling of milling process water were to occur. In reality, this figure is likely to be smaller, based on Orcem's plans to recapture and reuse a substantial portion of this process water.

Table 3.13-1
Orcem Estimated Water Demand

Process	Maximum Water Required (gallons/hour)	Hours/Day	Water Demand (gallons/day)	Number of Days/Year	Maximum Annual Hours	Water Demand (gallons/year)
Milling Process	1,321	22	29,062	320	7,040	9,299,840
Cooling Circuit	10	22	220	350	7,700	77,000
GBFS Spraying	300	8	2,400	140	1,120	336,000
Employees (Multiple Shifts)	25	24	600	350	8,400	210,000
TOTAL	**1,656**	**—**	**32,282**	**—**	**—**	**9,922,840**

The proposed project would require a combined maximum of 46,082 gallons of water per day (13,800 gallons for VMT and 32,282 gallons for Orcem). As described previously, the project site is currently served by the City of Vallejo Water Division. The City utilizes the Fleming Hill WTP to treat water that is delivered from the Sacramento River Delta, Lake Berryessa, and Lake Curry, and it has a maximum design flow rate of 42 mgd (City of Vallejo 2006). The proposed project's demand for 46,082 gallons of water per day constitutes 0.1% of the maximum design flow rate of the Fleming Hill WTP. The increase in the need for treated water would be easily accommodated by the City's existing WTP; therefore, no expansion of the Fleming Hill WTP or construction of new water treatment facilities would be required, and impacts would be **less than significant**.

Wastewater

As described above, the VMT project component is projected to generate a total of 1,800 gallons of wastewater per day, and the Orcem project component is projected to generate a total of 600 gallons of wastewater per day, for a total of 2,400 gallons of wastewater generated on the project site per day. All wastewater collected from the project site would be treated at the Ryder Street WWTP. The Ryder Street WWTP has a permitted dry weather capacity of 15.5 mgd. The short-term wet weather capacity of the Ryder Street WWTP is 60 mgd. During the rainy season, the Ryder Street WWTP has a capacity of 35 mgd for full secondary treatment and an additional 25 mgd for primary treatment. The addition of 2,400 gallons of wastewater per day would constitute less than 0.02% of the total permitted dry weather treatment capacity of the Ryder Street WWTP. The Ryder Street WWTP has existing capacity to serve the proposed project and no new or expanded wastewater treatment facilities would be needed. Therefore, impacts would be **less than significant**.

Off-Site Improvements

The proposed project includes two off-site improvements (public access improvements and removal of existing deteriorated docks) that would take place at the City of Vallejo Municipal Marina located approximately 2 miles north of the project site. These improvements would not require water service, nor would they generate wastewater. Therefore, **no impact** would occur as a result of the off-site improvements.

C) Would the project 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?

Stormwater is discussed in Section 3.8, Hydrology and Water Quality, of this document.

D) Would the project have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

VMT and Orcem Project Analysis

As described under Threshold B, above, the proposed project would require a combined maximum of 46,082 gallons of water per day (13,800 gallons for VMT and 32,282 gallons for Orcem). The City's UWMP, described in the Regulatory Setting section, evaluates the City's ability to provide water supply to meet the projected demands through year 2025. The City's projected water supply for normal water years between 2010 and 2025 is 46,444 AFY (41,462,585 gallons per day). The proposed project's demand for water would be less than 0.01% of the City's daily water allocation through 2025, and would therefore be accommodated by the City's existing water supply. In addition, the City has a Water Shortage Contingency Plan to ensure that the water supplies will be sufficient to serve the project and other planned growth in normal, dry and multiple-dry years. Therefore, impacts would be **less than significant**.

Off-Site Improvements

The proposed project includes two off-site improvements that would take place at the City of Vallejo Municipal Marina located approximately 2 miles north of the project site as described earlier. As also described earlier, these improvements would not require water service. Therefore **no impact** would occur as a result of the off-site improvements.

E) Would the project result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

VMT and Orcem Project Analysis

As described previously, the proposed project would generate a total of 2,400 gallons of wastewater per day (1,800 gallons from the VMT project component and 600 gallons from the Orcem project component), which would be collected by VSFCD sewer lines and treated at the Ryder Street WWTP. The Ryder Street WWTP has a permitted dry weather capacity of 15.5 mgd. The short-term wet weather capacity of the Ryder Street WWTP is 60 mgd. During the rainy season, the Ryder Street WWTP has a capacity of 35 mgd for full secondary treatment and an additional 25 mgd for primary treatment. The addition of 2,400 gallons of wastewater per day would constitute less than 0.02% of the total permitted dry weather treatment capacity of the Ryder Street WWTP. The Ryder Street WWTP has existing capacity to serve the proposed project and additional capacity would not be needed as a result of the proposed project. Therefore, impacts would be **less than significant**.

Off-Site Improvements

The proposed project includes two off-site improvements that would take place at the City of Vallejo Municipal Marina located approximately 2 miles north of the project site as described earlier. These improvements would not generate wastewater. Therefore **no impact** would occur as a result of the off-site improvements.

F) Would the project be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

VMT and Orcem Project Analysis

Construction

Construction of the proposed project would involve demolition of several existing buildings and structures on the project site, which would generate solid waste. The VMT project component would require demolition of the existing wharf structures, the 42,000-square-foot warehouse building, and the 4,700-square-foot bakery bulkhouse building, which would generate a total of approximately 105 tons of debris. Of this total, 75 tons would be transported to the Keller Canyon Landfill, and the remaining 30 tons would be recycled.

The Orcem project component would require the demolition of 156,000 square feet of existing buildings and structures, which would generate approximately 40,720 tons of debris. Of this total, 39,500 tons of concrete would be crushed on site and retained for use as recycled engineered backfill for use on site. An additional 1,050 tons of steel would be recycled. The remaining 170 tons would be transported to the Keller Canyon Landfill.

In total, 245 tons of demolition debris from the proposed project would be disposed of at the Keller Canyon Landfill. The Keller Canyon Landfill has a remaining capacity of 63,408,410 cubic yards and currently receives 3,500 tons of solid waste each day. In addition, the landfill is anticipated to be open until December 31, 2030 (CalRecycle 2014). Since the project would be served by a landfill with sufficient remaining capacity through the year 2030, impacts due to construction and demolition debris would be **less than significant**.

Operations

Once operational, the VMT project component is expected to generate up to 5 cubic yards of solid waste per week. The Orcem project component is also expected to generate up to 5 cubic yards of solid waste per week, for a total weekly volume of 10 cubic yards. Annually, the total solid waste generated as a result of the proposed project would be approximately 520 cubic yards. Solid waste collection service would be provided by Recology and transported to the Keller Canyon Landfill. As described above, the Keller Canyon Landfill has a remaining capacity of 63,408,410 cubic yards and currently receives 3,500 tons of solid waste each day. The additional 10 cubic yards of solid waste per week from the proposed project would be accommodated within the existing Keller Canyon Landfill, which has sufficient remaining capacity through the year 2030. Therefore, impacts due to operations of the proposed project would be **less than significant**.

Off-Site Improvements

The proposed project includes two off-site improvements that would take place at the City of Vallejo Municipal Marina located approximately 2 miles north of the project site as described earlier. Installation of the launch ramp would not generate solid waste, nor would solid waste be generated during operation of the ramp. However, the dock removal would generate approximately 113 tons of debris. Of this total, approximately 68 tons would be transported to the Keller Canyon Landfill and the remaining 45 tons would be recycled. As described above, the Keller Canyon Landfill has a remaining capacity of 63,408,410 cubic yards and currently receives 3,500 tons of solid waste each day. The additional 63 tons of solid waste generated by removal of the docks would be accommodated within the existing Keller Canyon Landfill, which has sufficient remaining capacity through the year 2030. Therefore, impacts would be **less than significant**.

G) *Would the project comply with federal, state, and local statutes and regulations related to solid waste?*

VMT and Orcem Project Analysis

Construction

As described above, both the VMT and Orcem project components would generate construction and demolition debris. Together, the VMT and Orcem project components would generate approximately 40,825 tons of construction and demolition debris. Of this total, 39,500 tons of concrete would be crushed on site and retained for us as recycled engineered backfill, and 1,080 tons would be recycled. The remaining 245 tons would be transported to the Keller Canyon Landfill. Chapter 7.53 of the City's Municipal Code, the Construction and Demolition Debris Recycling Ordinance, sets a goal of diverting, by recycling or reuse, 50% or more of the materials (by weight) and 75% of concrete and asphalt. The project would recycle or reuse approximately 99% of the construction and demolition debris generated on the project site. The project would therefore exceed the goal of the City's Construction and Demolition Debris Recycling Ordinance. Impacts would be **less than significant**.

Operations

Recology would provide solid waste and recycling collection services for both the VMT and Orcem project components. Recyclable materials would be sent to the appropriate recycling facilities, while solid waste would be disposed of at the Keller Canyon Landfill. A total of 10 cubic yards of solid waste is expected each week from the proposed project. Recycling programs would be implemented as part of both projects to ensure the amount of solid waste sent to the landfill is minimized. The proposed project would comply will all applicable regulations related to solid waste and recycling. Therefore, impacts would be **less than significant**.

Off-Site Improvements

As described above, installation of the launch ramp would not generate solid waste, nor would solid waste be generated during operation of the ramp. However, the dock removal would generate approximately 113 tons of debris. Of this total, approximately 68 tons (60%) would be transported to the Keller Canyon Landfill and the remaining 45 tons (40%) would be recycled. Chapter 7.53 of the City's Municipal Code, the Construction and Demolition Debris Recycling Ordinance, sets a goal of diverting, by recycling or reuse, 50% or more of the materials (by weight) and 75% of concrete and asphalt. Although the off-site improvements would not meet the goal of diverting 50% of construction and demolition debris from the landfill, when combined with the overall construction of the VMT and Orcem facilities, the goal would be exceeded since the VMT and Orcem project would recycle approximately 99% of all construction and demolition debris. Therefore, impacts would be **less than significant**.

H) Would the project increase the demand of energy resources to exceed the available supply or cause a need for new or expanded facilities?

VMT Analysis

The VMT project component would require electricity and natural gas, which would be provided by PG&E. Natural gas demands would be minimal since natural gas would only be used for heating of the administration building, which is connected to an existing PG&E gas line. VMT would, however, require electricity to power the various terminal facilities and buildings. It is estimated that the peak electric load for VMT would be approximately 645 kilowatts (kW). PG&E has provided a will-serve letter, confirming its ability to provide this service from the facilities currently available near the site (PG&E 2015). Since the VMT project component would not result in natural gas or electricity demands that exceed the available supply, impacts would be **less than significant**.

Orcem Analysis

The proposed Orcem project component would be a large consumer of electricity and natural gas. The main milling equipment would be powered by a large electric motor, which when combined with all other equipment would require a supply of up to 6 megawatts (MW). The existing General Mills facility has a 12-kilovolt (kV) supply which accesses the site via twin overhead lines on poles. These lines and poles remain on the site and PG&E has confirmed that they can be upgraded to provide the new supply to the Orcem project component. In addition, PG&E prepared a feasibility study for Orcem that determined there is capacity on existing circuits in Vallejo to accommodate the services requested by Orcem (PG&E 2014).

The Orcem production process would require natural gas to dry the moist ground granulated blast furnace slag (GGBFS). The estimated peak natural gas load needed for the Orcem project component is 35.9 million cubic feet per hour. PG&E has determined that adequate natural gas supply is available to serve the Orcem project component; however, reinforcements of the existing gas system would be required to serve the proposed peak hourly load. A new plastic gas main would be required on Derr Street from Lemon Street to the Orcem Site, and a gas tie-in would be required at the intersection of Sonoma Boulevard and Lemon Street (PG&E 2014). Although a new gas line and other improvements would be necessary to serve the Orcem project component, the natural gas demand would be met by existing supplies, and no new natural gas supplies would be necessary. Since the Orcem project component would not result in natural gas or electricity demands that exceed the available supply, impacts would be **less than significant**.

Off-Site Improvements

The proposed project includes two off-site improvements that would take place at the City of Vallejo Municipal Marina located approximately 2 miles north of the project site as described earlier. These improvements would require energy during construction and demolition activities; however, this would only occur temporarily during construction and would not exceed the available supply of energy. Once operational, no energy would be required for the off-site improvements. Therefore, impacts would be **less than significant**.

I) Would the project result in a wasteful, inefficient, or unnecessary use of energy?

VMT Analysis

As described above, the VMT project component would require the use of energy, in the form of electricity and natural gas, for daily operations. Natural gas usage would be minimal. Electricity would be used to power the various VMT facilities and would not be used in any way besides to support the operations necessary at an active deep-water terminal. Energy use associated with the VMT project component would not be wasteful or inefficient, and impacts would therefore be **less than significant**.

Orcem Analysis

As described above, the Orcem project component would require the use of energy during daily operations in the form of electricity and natural gas. Although the Orcem project component would result in an overall increase in energy use compared to the existing conditions, the use of energy would be necessary to support the proposed cement processing plant. The location of the Orcem Site adjacent to the proposed VMT facility would minimize energy use associated with transporting raw materials to the site. In addition, the processing of GGBFS (green cement) by Orcem is estimated to require nearly 90% less energy than the processing of an equivalent amount of portland cement. Orcem would therefore implement a more energy-efficient cement production process than traditional portland cement. Energy use associated with the Orcem project component would not be wasteful or inefficient, and impacts would therefore be **less than significant**.

Off-Site Improvements

The proposed project includes two off-site improvements that would take place at the City of Vallejo Municipal Marina located approximately 2 miles north of the project site, as described earlier. These improvements would require energy during construction and demolition activities; however, the use of energy would not be wasteful, inefficient, or unnecessary. Once operational, no energy would be required for the off-site improvements. Therefore, impacts would be **less than significant**.

3.13.5 Mitigation Measures

No mitigation would be required.

3.13.6 Level of Significance After Mitigation

No mitigation measures are required; therefore, impacts would remain less than significant.

CHAPTER 4
CUMULATIVE IMPACTS

4.1 INTRODUCTION

Although the environmental effects of an individual project may not be significant when that project is considered independently, the combined effects of several projects may be significant when considered collectively. Such impacts are “cumulative impacts.” Section 15355 of the California Environmental Quality Act (CEQA) Guidelines defines cumulative impacts as “two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts” (14 CCR 15000 et seq.). Section 15130 of the CEQA Guidelines provides guidance for analyzing significant cumulative impacts in an Environmental Impact Report (EIR). According to this section of the CEQA Guidelines, the discussion of cumulative impacts “need not provide as great detail as is provided for the effects attributable to the project alone. The discussion should be guided by standards of practicality and reasonableness.” The discussion should also focus only on significant effects resulting from the project’s incremental effects and the effects of other projects. According to Section 15130(a)(1), “An EIR should not discuss impacts which do not result in part from the project evaluated in the EIR.”

However, substantial cumulative impacts more often result from the combined effect of past, present, and future projects located in proximity to the project under review. Therefore, it is important for a cumulative impacts analysis to be viewed over time and in conjunction with other related past, present, and reasonably foreseeable future developments whose impacts might compound or interrelate with those of the project under review.

4.2 METHODOLOGY

According to Section 15130(b) of the CEQA Guidelines, cumulative impact analysis may be conducted and presented by either of two methods: (1) a list of past, present, and probable activities producing related or cumulative impacts; or (2) a summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document that has been adopted or certified, which described or evaluated regional or area-wide conditions contributing to the cumulative impact. Other than for transportation and traffic, the cumulative list approach has been utilized in the cumulative analysis presented in this chapter, as discussed below. Cumulative traffic and transportation impacts have been analyzed utilizing the summary of projections method.

4.2.1 Cumulative Projects List

The cumulative impacts analysis is based on a list of projects within the proposed project's study area that either have applications submitted or approved, are under construction, or have recently been completed. Based on information provided by the City of Vallejo staff, three cumulative projects were considered in this analysis:

1. Proposed 2,580-square-foot quick-service restaurant and 1,300-square-foot convenience store with gasoline sales located at 1217 Fifth Street/Sonoma Boulevard.
2. Anchor Storage – 925-unit self-storage facility with an on-site manager's unit on 3.9 acres, located at 501 Solano Avenue.
3. Former Vallejo Manufactured Gas Plant (MGP) Site Cleanup – Remediation of 26-acre former MGP site located at the southwest corner of Curtola Parkway and Sonoma Boulevard. Remediation is expected to occur in phases between 2017 and 2019 and would be under the oversight of the California Department of Toxic Substances.

4.3 CUMULATIVE IMPACT ANALYSIS

The discussion below evaluates the potential for the proposed project to contribute to an adverse cumulative impact on the environment. For issues addressed in this EIR, the thresholds used to determine significance are those presented in each of the sections of Chapter 3, Environmental Analysis. For issues in which project impacts were determined to be less than significant during the preliminary environmental review process, the thresholds consist of the questions posed for that respective issue in Appendix G of the CEQA Guidelines. For each resource area, an introductory statement is made regarding what would amount to a significant cumulative impact in that resource area. Discussion is then presented regarding the potential for the identified cumulative projects to result in such a cumulative impact, followed by discussion of whether the project's contribution to any cumulative impact would be cumulatively considerable.

4.3.1 Aesthetics

As described in Section 3.1, Aesthetics, the proposed project would not have any significant impacts to aesthetics aside from a potentially significant impact due to proposed lighting; however, this impact would be reduced to a less-than-significant level with mitigation. The cumulative projects are not located within sight of the proposed project and would therefore not impact the aesthetics of the proposed project site. Although the cumulative projects may introduce new sources of lighting, the lighting would not be visible from the proposed project site. Cumulative impacts to aesthetics would therefore be less than significant.

4.3.2 Air Quality

As described in Section 3.2, Air Quality, by its nature air pollution is largely a cumulative impact; no single project is sufficient in size to, by itself, result in nonattainment of ambient air quality standards. In developing thresholds of significance for air pollutants, the Bay Area Air Quality Management District (BAAQMD) considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified significance thresholds, its emissions would be considered cumulatively considerable, resulting in significant adverse air quality impacts to the region's existing air quality conditions. The proposed project would conflict with the Bay Area 2010 Clean Air Plan due to the proposed rezoning of the 5.25-acre portion of the project site. In addition, the proposed project would exceed annual emission thresholds for NO_x during operations and would exceed the BAAQMD threshold for cancer risk. Mitigation as described in Section 3.2.5 would help reduce project impacts, including reducing the potential for cancer risk to below a level of significance. However, impacts related to the conflict with the 2010 Clean Air Plan and NO_x emissions during operations would remain significant and unavoidable. Project operations would therefore result in significant cumulative air quality impacts.

As described in Section 3.2, Air Quality, construction of the cumulative projects would be short term and temporary in nature. Construction of the quick-service restaurant and gas station convenience store, and self-storage facility would contribute minimal emissions during construction, and would not be anticipated to result in substantial emissions when considered in combination with the proposed project. Construction of the Pacific Gas & Electric (PG&E) Southern Waterfront site would consist of demolition of on-site structures, site preparation, and remediation activities. Pollutants generated as a result of these activities would consist primarily of fugitive dust as a result of demolition and site preparation/ remediation activities. The PG&E remediation project would include on-site fugitive dust monitoring as part of its demolition work plan and health and safety plan. On-site monitoring would ensure adequate implementation of fugitive dust control measures during dust-generating activities, and would mitigate visible dust plumes and related fugitive dust impacts to a level below significance. As fugitive dust impacts are generally localized to individual project sites, and on-site emissions would be sufficiently mitigated through demolition and dust control measures, coupled with implementation of BAAQMD best management practices for all cumulative projects, cumulative impacts related to fugitive dust would be considered less than significant. Construction of the proposed project would not exceed BAAQMD construction thresholds for any criteria pollutants; therefore, cumulative impacts would be considered less than significant during the temporary construction period.

4.3.3 Biological Resources

As described in Section 3.3, Biological Resources, the proposed project would have potentially significant impacts on both marine and terrestrial species due to construction activities (noise and structure demolition) and alteration of habitat from facility operation; however, these impacts would be reduced to less-than-significant levels with mitigation. The cumulative projects are proposed for sites that are in highly impacted areas with limited biological resources. Thus, significant biological resources are not expected from these projects. Therefore, the proposed project in combination with the cumulative projects would not result in significant cumulative effects related to biological resources.

4.3.4 Cultural Resources

The proposed project would contribute to a cumulative impact on cultural resources if its incremental effects coincided and potentially compounded with effects from other reasonably foreseeable future projects to result in a significant impact on local cultural resources. As described in Section 3.4, Cultural Resources, the proposed project would result in a significant and unavoidable impact to historic resources due to demolition of the existing flour mill, grain silos, and dock. In addition, construction of the proposed project could result in significant impacts to buildings not proposed to be demolished as well as significant impacts to archaeological resources, fossils, or human remains, if discovered on site. However, with implementation of mitigation measures, these impacts would be reduced to less-than-significant levels.

The cumulative projects are located on vacant sites or sites that do not contain any historic resources and would therefore not result in the demolition of any historic structures. Although there could be potential for the discovery of unknown archaeological or paleontological resources, it is anticipated that standard measures would be in place to ensure impacts are less than significant. Therefore, although the proposed project would result in a significant and unavoidable impact to historic resources, the cumulative impact in combination with the cumulative projects would not be significant.

4.3.5 Geology and Soils

As described in Section 3.5, the proposed project would not result in any significant impacts related to geology and soils aside from the potential for landslides; however, this impact would be reduced to less than significant with mitigation. Both the proposed project and the cumulative projects would be required to comply with the California Building Code to ensure impacts due to seismic activity are minimized. In addition, the cumulative projects are located on generally flat sites that are not at risk for landslide. Therefore, the proposed project in combination with the cumulative projects would not result in a significant cumulative impact to geology and soils.

4.3.6 Greenhouse Gas Emissions

As described in Section 3.6, Greenhouse Gas Emissions, operational emissions of both the Orcem and VMT components of the proposed project would exceed the BAAQMD threshold for operational greenhouse gas (GHG) emissions. In addition, while the proposed project would comply with applicable implementation measures of the City's 2012 Climate Action Plan, it cannot be guaranteed that the project would be consistent with the objectives of the City's Climate Action Plan to achieve reduction targets established for 2020 and 2035. This is because the City's adopted CAP does not cover marine and rail operations which are an important part of the proposed project. The proposed project would also be exposed to impacts due to sea level rise that would be reduced to below a level of significance with mitigation. The cumulative projects include small commercial operations and a temporary remediation project that are not expected to generate significant GHG emissions. However, the BAAQMD considers any project that would generate GHG emissions above the BAAQMD threshold, to contribute substantially to a cumulative impact. Therefore, a significant cumulative impact to GHG emissions would occur as a result of the project, and this impact would be significant and unavoidable.

4.3.7 Hazards and Hazardous Materials

As described in Section 3.7, Hazards and Hazardous Materials, construction of the proposed project would require the temporary use of hazardous materials, such as diesel fuels, lubricants, solvents, and asphalt. Without mitigation to ensure proper handling, storage, disposal, and emergency response planning, impacts could be significant but are reduced to less-than-significant levels with mitigation as outlined in Section 3.8. The cumulative projects would likely involve similar temporary use of hazardous materials during the construction phase, particularly the former MGP site cleanup. However, the cumulative projects would be required to manage hazardous materials in compliance with both state and federal regulations on hazardous materials such that their individual effects would be mitigated to less-than-significant levels. In addition, the former MGP site cleanup would be overseen by the California Department of Toxic Substances Control to ensure that impacts related to hazards and hazardous materials are minimized. Given that mitigation would be required, the proposed project would not contribute a cumulatively considerable effect.

The proposed project would also involve the dredging of sediment in Mare Island Strait which may contain elevated concentrations of metal contaminants. Transport and disposal of the dredged material could result in a significant impact. With mitigation, this impact is reduced to less-than-significant levels as outlined in Section 3.7. The cumulative projects do not involve dredging or the transport or disposal of dredged material; therefore, the proposed and cumulative projects would not result in cumulative effects related to dredging.

The proposed project involves the demolition of buildings that were found to contain asbestos-containing materials. Disposal, transport or use of these materials as engineered fill could result in a significant impact. These impacts are reduced to less-than-significant levels with the mitigation outlined in Section 3.7. The cumulative projects are located on vacant sites or sites with minimal buildings and therefore would not require demolition and subsequent transport or disposal of any asbestos-containing materials. Therefore, there is no risk of a cumulative effect due to the handling of asbestos-containing materials.

4.3.8 Hydrology and Water Quality

Cumulative Impacts to hydrology and water quality would result if the proposed project and the cumulative projects contributed incrementally to a net effect on water quality and hydrology in the project vicinity, or any downstream body of water. As described in Section 3.8, Hydrology and Water Quality, the proposed project would result in a potentially significant impact from the risk of mobilizing pollutants currently sequestered in bay sediments and the pilings of the former General Mills wharf during dredge and fill, and piling removal as part of the VMT project component. These impacts are reduced to less-than-significant levels as outlined in Section 3.8, with mitigation measures MM-3.8-1, MM-3.8-2, MM-3.3-3, and MM-3.3-4. Two of the cumulative projects—the convenience store and storage unit facility—would be located away from the shoreline and would not involve any proposed marine construction activities. The former MGP site cleanup would be located adjacent to the shoreline; however, no in-water work would occur that would contribute to a potential cumulative impact. Therefore, there is no risk of a cumulative effect due to those dredge and fill or piling removal activities, and the proposed project’s contribution to a cumulative effect would not be cumulatively considerable.

4.3.9 Land Use and Planning

A cumulative impact to land use and planning could occur if the proposed and cumulative projects contributed incrementally to a land use impact that is inconsistent with local plans and policies, including those set by the Bay Conservation and Development Commission, the City of Vallejo General Plan, and the Solano County General Plan. As described in Section 3.9, Land Use and Planning, the proposed project does not result in any significant impacts. However, the proposed project would involve the annexation and re-designation of 5.25 acres of land currently designated as “Park and Recreation” use in the Solano County General Plan, into “Employment” use by the City of Vallejo. This impact is considered to be less than significant as described in Section 3.9. Similarly, the other cumulative projects do not involve any changes in land use designation under the Solano County General Plan and are not anticipated to result in any significant impacts since the City would ensure consistency with applicable plans and policies. Therefore, cumulative impacts to land use and planning would be less than significant.

4.3.10 Noise

A cumulative impact on the noise environment in the project vicinity would result if the proposed project and the cumulative projects in combination resulted in a noise impact greater than either project generates independently. At least one of the areas designated as a potentially noise-sensitive location for the proposed project (the Seawitch Drive Apartments) is located within 0.5-mile of the cumulative project located at 1217 5th Street, meaning that there is potential for noise from the proposed project to have a cumulative effect in that area. The operational noise impact of the proposed project is considered to be significant and unavoidable after mitigation since the mitigation cannot be guaranteed. The project located at 1217 5th Street would include a quick-service restaurant and convenience store with gasoline sales, which are not expected to generate long-term permanent noise increases. In addition, the long-term permanent noise impact of the other cumulative projects is not likely to be significant given the location and nature of these projects. Therefore, a cumulative effect due to operational impacts is not anticipated.

If the timing of construction of the cumulative projects coincides with the proposed project, the projects could contribute to a temporary cumulative impact on noise in the area. However, given the location of the proposed project in relation to the cumulative projects, the potential for cumulative noise effects during construction is unlikely. As described in Section 3.10, the construction noise impacts of the proposed project would be mitigated to less-than-significant levels. Therefore, cumulative noise impacts would be less than significant.

4.3.11 Public Services and Recreation

As described in Section 3.11, Public Services and Recreation, the proposed project would not result in any significant impacts to public services and recreation. Although the project would slightly increase demands for police and fire services, the impact would not be significant. Similarly, the cumulative projects may cause a slight increase in demands for police and fire services; however, the projects are located in developed areas of the City that are currently served by the City’s police and fire departments. Neither the proposed project nor the cumulative projects would cause an increase in demands for recreation facilities. Therefore, cumulative impacts to public services and recreation would not be significant.

4.3.12 Transportation and Traffic

As described in Section 3.12, Transportation and Traffic, the proposed project would result in increased truck traffic to and from the project site that could temporarily inhibit vehicular and non-vehicular travel. This impact is reduced to less-than-significant levels with mitigation described in Section 3.12. However, the cumulative projects are located on Sonoma Boulevard along one of the truck routes that connects the project site to Interstate 80 (I-80) West. Further increases in traffic due to added truck trips, or construction equipment for the cumulative projects on Sonoma Boulevard, could result in a temporary cumulative effect on local traffic congestion during the construction phase, but due to the minor short-term increase, this impact is not expected to be significant.

The proposed project is projected to generate train trips that would cause increased delays at train crossings. As described in Section 3.12, this impact would remain significant and unavoidable with mitigation since the mitigation cannot be guaranteed. The cumulative projects would not utilize railways. Therefore, although the project's impacts due to delays at train crossings would be significant, there would not be a significant cumulative effect on transportation and traffic as a result of train traffic from the cumulative projects.

The proposed project would also require improvements to roads in order to safely handle the increased truck traffic associated with daily operation of the proposed project which constitutes a significant impact but is reduced to less-than-significant levels with mitigation. Two of the cumulative projects—the convenience store and storage unit facility—are likely to involve a small number of truck trips for restocking and delivery. However, the volume of truck traffic for those purposes is unlikely to warrant any capital improvements to roadways. Therefore, there would not be a significant cumulative effect as a result of increased demand for road maintenance and improvements.

The increase in train, automobile, and truck trips resulting from operation of the proposed project is likely to result in a significant impact on pedestrian and bicycle transit by making those modes of transportation less safe and convenient. This effect would be reduced to less-than-significant levels with mitigation. The cumulative projects would have minimal operational impacts on automobile and truck traffic. Therefore, there would be no cumulative impact on pedestrian and bicycle traffic as a result of the proposed project in combination with the cumulative projects. Cumulative traffic impacts would be less than significant.

4.3.13 Utilities and Service Systems

A significant cumulative impact would result if the proposed project and other nearby projects contributed to a net impact on local utilities and service systems such as overburdening municipal waste management services or depleting available municipal water. As described in Section 3.13, Utilities and Service Systems, the proposed project would have less-than-significant impacts on wastewater treatment and water consumption. These impacts would be reduced to less-than-significant levels with mitigations outlined in Section 3.13. The cumulative projects would also contribute an incremental increase on demand for water and wastewater treatment. However, the cumulative projects are small in scale and therefore are unlikely to result in a cumulative effect when added to the demands of the proposed project.

The proposed project would result in the generation of 170 tons of debris during construction and a projected 10 cubic yards/week during operation that would need to be disposed at Keller Canyon Landfill. As described in Section 3.13, this impact is considered to be less than significant. The cumulative projects would likely be served by the same municipal waste management service and disposed at the same location at Keller Canyon. Keller Canyon currently receives 3,500 tons of solid waste per day and has a remaining capacity of 63,408,410 cubic yards. Given those capacities, the combined impacts of the proposed project and cumulative projects would not result in a cumulative effect.

The proposed project is likely to be a large consumer of natural gas and electricity to power milling equipment and to dry the slag used in the production of the cement product. PG&E performed a feasibility study for the proposed project and concluded that existing circuits in Vallejo have capacity to accommodate the projects demands. This impact is also considered to be less than significant. The cumulative projects would have a small impact on electricity and natural gas relative to the proposed project. Therefore the cumulative effect from the combined impacts of the cumulative projects and proposed project would not be significant.

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CHAPTER 5
OTHER CEQA CONSIDERATIONS

This chapter includes the following other considerations that are required to be discussed in an Environmental Impact Report (EIR):

- Effects Not Found to be Significant (Section 5.1)
- Significant and Unavoidable Environmental Impacts (Section 5.2)
- Significant and Irreversible Environmental Effects (Section 5.3)
- Growth Inducement (Section 5.4)

5.1 EFFECTS NOT FOUND TO BE SIGNIFICANT

Based on the analysis provided in the Initial Study, the proposed project would not result in significant impacts related to the following topics, which are not further evaluated in the EIR:

- Agricultural and Forest Resources
- Mineral Resources
- Population and Housing

Additional information and discussion regarding the effects found not to be significant can be found in the Initial Study, which is included as Appendix A of this EIR.

5.2 SIGNIFICANT AND UNAVOIDABLE ENVIRONMENTAL IMPACTS

Implementation of the project-specific mitigation measures identified in the Chapter 3 analysis would reduce all significant impacts to below a level of significance, with the exception of the following impacts:

Section 3.2, Air Quality

Impact 3.2-1

The proposed rezoning of the 5.25-acre portion of the project site has the potential to introduce a more intensive land use to the property, and this potential change was not taken into account in the most recent state ozone plan—the Bay Area 2010 Clean Air Plan, adopted by the Board of Directors in September 2010. As described in Section 3.2, there is no feasible mitigation to reduce or avoid this impact; therefore, the impact would be **significant and unavoidable**.

Impact 3.2-2

The proposed project would result in an exceedance of the Bay Area Air Quality Management District (BAAQMD) NO_x threshold, which would conflict with the Clean Air Plan's goal of bringing the San Francisco Bay Area Air Basin into attainment for ozone since NO_x is a precursor to the development of ozone. Although implementation of MM-3.2-1 would reduce NO_x emission levels, it cannot be quantitatively determined whether emissions levels would be reduced to a level that is less than significant. As such, Impact 3.2-2 would remain **significant and unavoidable**.

Impact 3.2-4

The proposed project would result in a considerable contribution to a significant cumulative impact because it would exceed the BAAQMD threshold for NO_x emissions during project operations. Although implementation of MM-3.2-1 would reduce emission levels, it cannot be quantitatively determined whether emissions levels would be reduced to a level that is less than significant. As such, Impact 3.2-4 would remain **significant and unavoidable**.

Impact 3.2-5

The proposed rezoning of the 5.25-acre portion of the project site has the potential to introduce a more intensive land use to the property, and this potential change was not taken into account in the most recent state ozone plan—the Bay Area 2010 Clean Air Plan, which would result in a cumulatively considerable impact. As described in Section 3.2, there is no feasible mitigation to reduce or avoid this cumulative impact; therefore, the impact would be **significant and unavoidable**.

Section 3.4, Cultural Resources

Impact 3.4-2

The proposed demolition of the flour mill, grain silos, and dock, and extensive new construction and site work would have a significant adverse effect on documented historic resources. Implementation of MM-3.4-2a and MM-3.4-2b would reduce the impact, but not to a less-than-significant level. Thus, the impact would remain **significant and unavoidable**.

Section 3.6, Greenhouse Gas Emissions

Impact 3.6-1

The proposed project would exceed the BAAQMD threshold for operational GHG emissions of 10,000 metric tons of carbon dioxide equivalent (MT CO_2E) per year. Implementation of MM-

3.6-1 would require fuel supply measures to reduce GHG emissions associated with operation of the proposed project; however, emissions would not be reduced to below a level of significance. Impact 3.6-1 would remain **significant and unavoidable**.

Impact 3.6-2

Although the proposed project would not directly conflict with or obstruct implementation of the City of Vallejo Climate Action Plan (CAP), because the City's adopted CAP does not cover marine and rail operations, it cannot be guaranteed that the proposed project would be consistent with the overarching objective of the City's CAP to achieve the reduction targets as established for 2020 and 2035. Implementation of MM-3.6-2a through 3.6-2d would require the applicants to encourage employee commute alternatives and reduce the amount of energy used for landscaping maintenance and irrigation. However, emissions would not be reduced to a level that would ensure the project would be consistent with the overarching objective of the City's CAP to achieve the reduction targets as established for 2020 and 2035. Impact 3.6-2 would remain **significant and unavoidable**.

Impact 3.6-3

Although the proposed project would not directly conflict with or obstruct implementation of the City of Vallejo CAP, it cannot be guaranteed that the proposed project would be consistent with the overarching objective of the City's CAP to achieve the reduction targets as established for 2020 and 2035, or the state's target reduction goals in 2030 and 2050. This is because the City's adopted CAP does not cover marine and rail operations, and therefore emissions cannot be assured of being consistent with the CAP. Implementation of MM-3.6-2a through 3.6-2d would require the applicants to encourage employee commute alternatives and reduce the amount of energy used for landscaping maintenance and irrigation. However, emissions would not be reduced to a level that would ensure the project would be consistent with the overarching objective of the City's CAP to achieve the reduction targets as established for 2020 and 2035, or the state's target reduction goals in 2030 and 2050. Impact 3.6-3 would remain **significant and unavoidable**.

Section 3.10, Noise

Impact 3.10-1

The increase in noise levels due to operation of the VMT project component would exceed established policies and standards at the following two locations:

- NSL5 (Colt Court Residences)
- NSL10 (3rd Street Residence)

Mitigation measure MM-3.10-1a would, if implemented, reduce these impacts; however, implementation is dependent on the California Northern Railroad since the City does not have jurisdiction over the railroad. While the City can require the applicants to work with the California Northern Railroad to make these improvements, the City cannot ensure that the California Northern Railroad will agree to make the improvements. Therefore, Impact 3.10-1 would remain **significant and unavoidable**.

Impact 3.10-3

The VMT project component would not generate any significant groundborne vibrations as a result of its operations aside from vibration caused by rail operations as described previously under Threshold A. For rail operations, one of the major sources of noise and vibration would be rolling stock on the existing jointed track. Mitigation measure MM-3.10-1a would, if implemented, reduce these impacts; however, implementation is dependent on the California Northern Railroad since the City does not have jurisdiction over the railroad. While the City can require the applicants to work with the California Northern Railroad to make these improvements, the City cannot ensure that the California Northern Railroad will agree to make the improvements. Therefore, Impact 3.10-3 would remain **significant and unavoidable**.

Section 3.12, Transportation and Traffic

Impact 3.12-2

The proposed project would cause substantial delays and queues at rail crossings (delays of over 1 minute during peak hours, or queues that block upstream intersections during the day and early evening when traffic volumes are at or near their peak hour levels) relative to delays and queues without the project. Mitigation measure MM-3.10-1a would, if implemented, reduce these impacts; however, implementation is dependent on the California Northern Railroad since the City does not have jurisdiction over the railroad. While the City can require the applicants to work with the California Northern Railroad to make these improvements, the City cannot ensure that the California Northern Railroad will agree to make the improvements. Therefore, Impact 3.12-2 would remain significant and unavoidable.

Impact 3.12-3

The proposed project would cause substantial delays and queues at rail crossings (delays of over 1 minute during peak hours, or queues that block upstream intersections during the day and early evening when traffic volumes are at or near their peak hour levels) relative to delays and queues in the Cumulative No Project condition. Mitigation measure MM-3.10-1a would, if implemented, reduce these impacts; however, implementation is dependent on the California Northern Railroad since the City does not have jurisdiction over the railroad. While the City can require the applicants to work with the California Northern Railroad to make these improvements, the City cannot ensure that the California Northern Railroad will agree to make the improvements. Therefore, Impact 3.12-3 would remain **significant and unavoidable**.

Impact 3.12-5

The proposed project would have a significant impact on emergency access, based on the potential delays generated by train crossings at the grade crossings in Vallejo, American Canyon, and crossings further north. Mitigation measure MM-3.10-1a would, if implemented, reduce these impacts; however, implementation is dependent on the California Northern Railroad since the City does not have jurisdiction over the railroad. While the City can require the applicants to work with the California Northern Railroad to make these improvements, the City cannot ensure that the California Northern Railroad will agree to make the improvements. Therefore, Impact 3.12-5 would remain **significant and unavoidable**.

5.3 SIGNIFICANT AND IRREVERSIBLE ENVIRONMENTAL EFFECTS

California Environmental Quality Act (CEQA) Guidelines mandate that the EIR must address any significant irreversible environmental changes that would be involved in the proposed action should it be implemented (CEQA Guidelines, Section 15126(c)). An impact would fall into this category if:

- The project would involve a large commitment of nonrenewable resources;
- The primary and secondary impacts of the project would generally commit future generations to similar uses;
- The project involves uses in which irreversible damage could result from any potential environmental incidents associated with the project; and/or
- The proposed consumption of resources is not justified (e.g., the project results in wasteful use of energy).

Determining whether the proposed project may result in significant irreversible effects requires a determination of whether key resources would be degraded or destroyed in such a way that there would be little possibility of restoring them.

Implementation of the proposed project would reestablish industrial uses on the project site, including construction and operation of a modern deep-water terminal that would be capable of handling a wide range of commodities, including construction materials and break-bulk items. In addition, the proposed project would result in the construction and operation of an industrial facility for the production and export of ground granulated blast furnace slag (GGBFS) cement, a product which is intended to meet the needs of construction projects for cement with a substantially reduced associated carbon footprint compared to traditional portland cement products, and the import of the raw material precursors of that product. This process necessarily consumes limited, slowly renewable, and nonrenewable resources. Resources consumed in this process include fossil fuels burned for the production of electricity that would power the main milling equipment and natural gas burned in the process of drying GGBFS materials. As an industrial process, the operation of this facility would by nature be resource-intensive; however, as an alternative to conventional cement production, the finished product could result in potential carbon savings and emissions reductions.

The construction of this facility would require the demolition of existing structures and the subsequent use of construction supplies including certain types of lumber and other forest products; aggregate materials used in concrete and asphalt such as sand, gravel and stone; metals such as steel, copper, and lead; petrochemical construction materials such as plastics; water; and fossil fuels such as gasoline and oil. All of these resources are frequently used in most general construction processes and are potentially nonrenewable.

The implementation of this project would commit future generations to the use of this site for the industrial production of GGBFS and or cement for the foreseeable future. As it stands, the site is already developed for industrial purposes and is in a state of vacancy and disrepair. The proposed project would not alter the use of the terrestrial site other than to utilize the currently unoccupied industrial space and erect one small building on a currently undeveloped portion of the property. The re-construction of the marine terminal would commit current and future generations to the use of the site as a terminal for bulk carrier ships delivering raw materials for the production of GGBFS and or cement. So long as the facility continues to operate, the area would experience increased traffic from bulk carrier ships delivering raw materials and transporting finished products from the facility. As described in Section 3.3, the benthic marine environment in the vicinity of the proposed marine terminal is not considered to be high value habitat for any sensitive or special-status aquatic species and fits predominantly within the footprint of the current decomposing General Mills wharf.

The project is not expected to result in any wasteful use of energy, as discussed in greater detail in Section 3.13, Utilities and Service Systems. The proposed project would be dependent on optimizing production and thus would have a vested interest in maximizing the efficiency of its use of resources.

5.4 GROWTH INDUCEMENT

CEQA requires a discussion of ways in which the proposed project could induce growth. The CEQA Guidelines identify a project as growth inducing if it fosters economic or population growth, or the construction of additional housing, either directly or indirectly in the surrounding environment (CEQA Guidelines, Section 15126.2[d]). New employees from commercial or industrial development and new population from residential development represent direct forms of growth. These direct forms of growth have a secondary effect of expanding the size of local markets and inducing additional economic activity in the area. A project could indirectly induce growth by reducing or removing barriers to growth or by creating a condition that attracts additional population or new economic activity. However, a project's potential to induce growth does not automatically result in growth. Growth can only happen through capital investment in new economic opportunities by the private or public sectors. Under CEQA, growth inducement is not considered necessarily detrimental, beneficial, or of little significance to the environment.

The proposed project does not include any residential development nor would it expand infrastructure in a way that facilitates future growth. The project would utilize an existing but currently non-operational site, already zoned and developed for industrial use, using the existing public utilities and infrastructure. The project is therefore not expected to directly induce growth by creating new housing, commercial, or industrial developments.

The proposed project is expected to generate jobs; the Orcem Plant estimates 100 jobs during the 15-month construction phase and up to 40 full-time jobs during operation. The VMT component of the project estimates 25 full-time jobs during regular daily operation, and up to 40 jobs during vessel loading and unloading periods. The generation of these new jobs could be considered indirectly growth inducing; however, a high demand for those skilled jobs exists within the City of Vallejo. As of 2010, approximately 3,184 Vallejo residents commuted out of the City to work in a manufacturing industry. About of one-third of these workers are in production occupations. Additionally, approximately 2,700 Vallejo residents commuted outside the City to work in the transportation and warehousing industry, including 61% in materials moving occupations such as truck drivers and ship packers (City of Vallejo 2012). Given the high number of Vallejo residents commuting outside the City for manufacturing and transportation/warehousing jobs, it is anticipated that the jobs generated as a result of the proposed project could be filled by existing Vallejo residents without resulting in growth from an influx of labor. The temporary spike in jobs during the construction phase is not expected to be growth inducing because of the short duration and temporary nature of those jobs.

This project could be considered to promote economic growth as it is likely to expand local markets and induce additional economic activity in the area through the import of raw materials for the production and export of "green cement." This effect is considered an indirect effect on growth.

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CHAPTER 6
ALTERNATIVES

6.1 INTRODUCTION

Pursuant to the California Environmental Quality Act (CEQA) Guidelines, Environmental Impact Reports (EIRs) are required to "describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives" (14 CCR 15126.6(a)). An EIR "must consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation" (14 CCR 15126.6(a)). The alternatives discussion is required even if these alternatives "would impede to some degree the attainment of the project objectives, or would be more costly" (14 CCR 15126.6(b)).

The inclusion of an alternative in an EIR does not constitute definitive evidence that the alternative is in fact "feasible." The final decision regarding the feasibility of alternatives lies with the decision maker for a given project who must make the necessary findings addressing the feasibility of alternatives for avoiding or substantially reducing a project's significant environmental effects (California Public Resources Code Section 21081; see also 14 CCR 15091).

6.2 PROJECT OBJECTIVES

The primary objectives of the proposed project are set forth in Chapter 2, Project Description, of the EIR and consist of the following:

- Establishment of the VMT Terminal as a key site of multi-modal and intermodal transportation and logistics, thereby enhancing Vallejo's role in the regional and international trade economy and providing a means for locally manufactured products to be transported and distributed, increasing the viability of and the potential for attracting further manufacturing operations to Vallejo.
- Maximize the potential for the manufacture of ground granulated blast furnace slag (GGBFS), a product that helps to meet the needs of the construction industry for high-performance, environmentally favorable concrete and sustainable building materials, by providing for an efficient scale of production at a plant which would operate around the clock as a multi-modal receiving, storage, processing, and distribution facility.
- To provide management and skilled labor employment opportunities for local and regional residents in the construction phases, as well as the long-term operations of commercial and industrial uses on the project site.

- To generate various tax revenues including property taxes and assessments, possessory interest tax, and utility user fees.
- To reestablish and optimize the industrial use of this centrally located marine industrial property through removal of those remaining components of the severely damaged timber wharf and construction of a modern deep-water terminal.
- To maximize accommodations for shipping and receiving of a wide range of products through the VMT Terminal, including loading and unloading of vessels of up to 70,000 metric tons in size with draft of up to 38 feet through the Phase 1 Wharf, along with a combination of barge and other smaller vessels through the Phase 2 rock dike. The improvements would help to further develop Vallejo's capabilities for water-based shipping in connection with the Port of Oakland.
- To maximize throughput capacity through the implementation of intermodal upgrades designed to optimize cargo handling operations as well as modern design initiatives enabling the most efficient use of the ground area and taking advantage of existing truck, rail, and shipping access for import and export of raw materials and finished products.
- To establish the VMT Terminal as a key site of multi-modal and intermodal transportation and logistics, thereby enhancing Vallejo's role in the regional and international trade economy.
- To provide a means for locally manufactured products to be transported and distributed, increasing the viability of and the potential for attracting further manufacturing operations to Vallejo (in addition to Orcem).
- To establish an around-the-clock multi-modal receiving, storage, processing, and distribution facility that would maximize the potential for the manufacture of ground granulated blast furnace slag (GGBFS), a high-performance, environmentally preferable concrete and sustainable building material.
- To reliably provide competitively priced and environmentally preferable cement products and offer GGBFS and non-GGBFS cementing products, in order to provide a complete line of competitive products that meet long-term client and project needs, and to have the ability to respond to potential worldwide shortages of GGBFS supplies, thereby assuring sustainability of Orcem's operation over time.
- To follow the federal Short Sea Shipping Highway Initiative where possible by focusing on short sea shipping opportunities that move cargo by coastal and inland waterway barges, reducing both truck and rail environmental impacts.

6.3 ALTERNATIVES CONSIDERED BUT REJECTED

An EIR must briefly describe the rationale for selection and rejection of alternatives. The lead agency may make an initial determination as to which alternatives are potentially feasible, and therefore merit in-depth consideration, and which are not feasible. Alternatives whose implementation is remote or speculative, or the effects of which cannot be reasonably predicted, need not be considered (CEQA Guidelines, Section 15126.6(f)(3)). Factors that may be considered when addressing the feasibility of an alternative include site suitability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries, economic viability, and whether the proponent can reasonably acquire, control, or otherwise have access to the alternative site.

6.3.1 Alternate Site

Alternate locations for the project site were considered; however, the applicants do not own any waterfront property in the area that would be suitable for the proposed project. The project site was selected by VMT on the basis of its unique capability to accommodate deep-water berthing for vessels of up to 70,000 tons, in combination with rail and truck access and space for transloading of goods and materials as described in Chapter 2.0, Project Description. This combination of functional amenities suitable for accommodation of both the VMT and Orcem project components is not easily accommodated in other Bay Area sites. Since VMT currently owns the project site and Orcem is leasing the portion of the site for their proposed facilities from VMT, it is not feasible for the applicants to reasonably acquire another site for the proposed project. An alternate site alternative is not evaluated further in this EIR.

6.3.2 Preservation Alternative

The Preservation Alternative would protect the historic characteristics of the project site by complying with the Secretary of the Interior’s Standards for Rehabilitation. Section 15064.5(b)(3) of the CEQA Guidelines states, “Generally, a project that follows the Secretary of the Interior’s Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings or the Secretary of the Interior’s Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings … shall be considered as mitigated to a level of less than a significant impact on the historical resource.”

The grain silo is a concrete structure that would require extensive structural and infrastructure improvements for either reuse as a storage facility or other adaptive use. The flour mill is a reinforced concrete building with brick infill panels and veneer that would have to be brought up to current code standards. The State Historical Building Code could be used to address some of the codes issues, but there would likely be a need for extensive seismic strengthening of the building. Structural work, accompanied by mechanical, electrical, and plumbing upgrades for the building, would be needed prior to or in conjunction with any kind of tenant improvements. Orcem would not reuse any portions of the grain silos and flour mill for their proposed mill building, filter building, workshop control room, and storage silos because the functional and structural requirements associated with the production of GGBFS would make reuse infeasible. The existing buildings occupy the majority of the Orcem Site and would preclude use of these areas for accommodation of necessary equipment, finished material storage, and raw material storage. The proposed raw material storage areas would be necessary for project operations. There is not sufficient space within the Orcem Site to accommodate the raw material storage areas without demolishing the grain silos and flour mill. Therefore, the Preservation Alternative would not be feasible for the Orcem project component.

The remnants of the existing dock would not lend themselves to rehabilitation due to their deteriorated condition. To serve as a functioning wharf, reconstruction is necessary. Reconstruction would allow for use of the wharf for limited maritime purposes. In order to be sufficient for the proposed use by VMT, this reconstruction would require a larger berthing area and reinforced wharf structure to handle the modern vessels that will transport materials to and from the site. Although it may be possible for VMT to construct new wharves on either side of the existing dock, this option would conflict with the functional operation of a modern deep-water marine terminal, would require a substantial additional amount of bay fill, and would increase potential impacts to marine biological resources.

It would not be feasible for the VMT project component to move forward under the Preservation Alternative, because VMT is dependent on removal and replacement of the severely damaged wooden piles and deck remnants with a new wharf and rock dike improvements capable of accommodating deep-water vessels of up to 70,000 metric tons capacity. In addition, the need for site grading and reuse of materials recycled from the old mill and silo structures to complete the terminal operations portion of the VMT Site would not be feasible under this alternative. While the VMT component could move forward with a different tenant for the 4.83-acre portion of the site proposed for use by Orcem, elimination of this key project component would eliminate a substantial portion of the shipping volume currently relied upon in determining the feasibility of the VMT operations. Additionally, it is unlikely that the existing buildings proposed for demolition could be used by another manufacturer. As a result, the Preservation Alternative is not a feasible alternative to the proposed project and is not evaluated further in this EIR.

6.3.3 Reduced Truck and Rail Alternative

The objective of the Reduced Truck and Rail Alternative is to decrease potential project impacts related to noise, traffic, and greenhouse gas (GHG) emissions and air quality. The Reduced Truck and Rail Alternative would develop the project site in a similar manner as the proposed project; however, the operations would be altered by shifting the mode of import and export of materials away from truck and rail and toward barges in all phases of the project. This alternative would replace approximately 40% of the truck and rail transport with barge transport. This would reduce noise and traffic impacts associated with truck and rail transport through surrounding neighborhoods and avoid transport by truck or rail during the night-time when noise impacts are more noticeable (and when a penalty is added to noise calculations). It would also reduce air quality impacts associated with the emissions of criteria pollutants resulting from trucks and rail traffic.

The Reduced Truck and Rail Alternative would not meet the basic project objectives because while it would theoretically accommodate the same level of throughput as the proposed project, it would interfere with the critical market-driven operations of both the VMT and Orcem components of the project. The Reduced Truck and Rail Alternative would preclude Orcem's shipping of their finished products via truck and rail as in the proposed project. Because the majority of Orcem's primary markets are in the inland areas and are only accessible via truck and rail, this alternative would not be feasible, as it would prevent the Orcem component from operating competitively. While the VMT operations may be able to incentivize shipment of goods via barge over time, a 40% reduction in rail and truck volumes would interfere with market contracts that are only accessible by rail and truck and, as a result, would prevent development of the terminal. This, in turn, would preclude both VMT and Orcem components. As a result, the Reduced Rail and Truck Alternative is not a feasible alternative to the proposed project and is not evaluated further in this EIR.

6.3.4 Reduced Scale Alternative

The objective of the Reduced Scale Alternative is to decrease potential project impacts related to noise, traffic, and GHGs and air quality. The Reduced Scale Alternative would develop the project site in a similar manner as the proposed project; however, the volume of materials moved through the VMT Terminal and Orcem Plant would both be reduced by 25% compared to the proposed project. This reduction in maximum operating capacity would affect Phases 1 and 2 of the VMT component by reducing the maximum monthly shipping cargo volume at the terminal from 160,000 to 120,000 metric tons. It would also reduce the maximum Phase 2 annual production volume for the Orcem Plant from 900,000 to 675,000 metric tons. This alternative would reduce the total average monthly number of vessels expected to arrive at the VMT Terminal (as shown in Table 2-3 in the Project Description) in Phase 1 from 4 to 3, and in Phase 2 from 7.5 to 6. The ratios of distribution for finished products and goods by truck, rail, and barge would be expected to remain unchanged, with proportionate volume reductions in all modes of transportation. This across-the-board reduction in operational volumes would reduce noise and traffic impacts associated with truck and rail transport through surrounding neighborhoods. Traffic impacts associated with temporary roadway closures at rail crossings under a 25% reduction in rail traffic would continue to be significant and unavoidable, as the duration of roadway closures would remain unchanged from the proposed project. The Reduced

Scale Alternative would also reduce air quality impacts associated with the emissions of criteria pollutants resulting from trucks and rail traffic, and would proportionately reduce GHG emissions; however, GHG and certain criteria pollutant emissions levels would remain significant and unavoidable, as in the case of the proposed project.

The Reduced Scale Alternative would preclude Orcem's ability to ensure the revenue required to justify: (1) the high level of fixed capital cost associated with construction of the plant; (2) the high fixed acquisition costs of equipment and operating systems involved in the state-of-the-art production and handling of GGBFS which also satisfies the Best Available Control Technology (BACT) technology mandates of the Bay Area Air Quality Management District (BAAQMD); and (3) the high costs of operating the plant which are relatively inelastic with respect to scaling back of output volumes, making this component of the project infeasible.

In addition, the Reduced Scale Alternative would also preclude the feasibility of VMT to construct and operate the terminal facilities because of: (1) very high initial fixed capital costs associated with demolition of the existing flour mill, silos, and wharf; initial dredging for deep-water accessibility to accommodate larger vessels; and overall site preparation and construction of the Phase 1 wharf and Phase 2 dike; (2) on-going fixed costs involving maintenance dredging, and terminal and equipment maintenance; and (3) the need to achieve a level of throughput scale required to support operation of barges as well as larger ocean-going deep-water vessels with access to international and local markets. The 25% reduction in production and throughput volumes, and therefore efficiency, as reflected in the Reduced Scale Alternative therefore makes this alternative to the proposed project infeasible. As a result, the Reduced Scale Alternative is not a feasible alternative to the proposed project and is not evaluated further in this EIR.

6.4 ALTERNATIVES ANALYSIS

This section discusses two alternatives to the proposed project, including the No Project Alternative. The No Project Alternative is a required element of an EIR pursuant to Section 15126.6(e) of the CEQA Guidelines that examines the environmental effects if the project were not to proceed. The Revised Operations Alternative is also discussed as part of the "range of reasonable alternatives" as the only other meaningful alternative to the proposed project which could result in substantial reductions in project impacts, while achieving most of the basic objectives of the project, including achieving a level of economic feasibility.

In considering a range of potentially feasible alternatives, this analysis was also limited based on the following facts: (a) a substantial portion of this site is within the Public Trust Tidelands Area, and pursuant to State Lands Commission requirements imposed on the City of Vallejo, is therefore limited to use for maritime industrial activities, commercial activities, and recreational, and open space; and (b) the site also contains a large area which was subject to clean-up of hazardous materials from the former mill operations use, as well as a closure plan, which preclude use of the site for most types of residential, playgrounds, child care, or other uses where exposure would otherwise create safety concerns. Additional alternatives, including a reduced-scale alternative, capable of substantially reducing certain impacts from the proposed project, are identified and discussed in Chapter 6.3; however, these have been dismissed because they would preclude project feasibility, and would therefore have the same outcome as the No Project Alternative.

6.4.1 No Project Alternative

Under the No Project Alternative, the project site would remain in its current condition. No buildings or structures would be demolished, and no construction of new buildings or structures would occur. The existing wharf structures would also remain, and no dredging or filling of Mare Island Strait would occur. The project site would remain vacant and no new operations would occur.

The No Project Alternative would not meet any of the project objectives since the site would remain unchanged. The site would not generate new employment opportunities or increased tax revenues. The site would not become a marine terminal and would not provide for the production of GGBFS; therefore, the objectives related to maximizing the capabilities of the site for shipping and GGBFS production would not be achieved under this alternative.

Aesthetics

The No Project Alternative would avoid all potential impacts to aesthetics since the project site would remain unchanged and the existing buildings and structures on the site left intact. The No Project Alternative includes no new development or new sources of light and glare. As a result, the No Project Alternative may result in slightly reduced impacts when compared to the proposed project, although the proposed project would not result in any significant impacts to aesthetics after mitigation and would remove deteriorated structures and abandoned buildings from the site, and install landscape improvements.

Air Quality

The No Project Alternative includes no construction on the project site or operations that would increase air emissions since the proposed project would not be implemented. The No Project Alternative would avoid all significant and unavoidable impacts to air quality and would therefore result in greatly reduced impacts compared to the proposed project.

Biological Resources

The No Project Alternative would not require any construction on land or in the water that would potentially impact special-status species or sensitive habitat and no dredging or fill of the Bay would be required. Although no new significant impacts to biological resources would occur as a result of the No Project Alternative, this alternative would not provide the benefits of removal of abandoned vessels and creosote piles both on the project site and at the City’s marina. Impacts would nonetheless be reduced compared to the proposed project, which would result in less-than-significant impacts to biological resources after mitigation.

Cultural Resources

The No Project Alternative would not involve any demolition of existing structures on the project site and would therefore avoid any significant impacts due to demolition of potentially historic resources. Impacts to historic resources would be greatly reduced compared to the proposed project, which would result in a significant and unavoidable impact to documented historic resources.

Geology and Soils

The No Project Alternative includes no development that could potentially increase exposure to geologic hazards such as seismic ground-shaking or landslides. The site would remain in its current vacant condition, and therefore some potential impacts associated with construction and related to geology and soils would be avoided. The No Project Alternative represents a slight improvement over the proposed project since there would be no increase in the use of the site, and potential risks from hazardous geologic conditions would be avoided.

Greenhouse Gas Emissions

The No Project Alternative would not involve any construction on the project site or operations that would increase greenhouse gas (GHG) emissions since the proposed project would not be implemented. By eliminating all improvements and industrial operations on the site, the No Project Alternative would avoid all significant and unavoidable impacts to GHG emissions and would therefore result in greatly reduced impacts compared to the proposed project.

Hazards and Hazardous Materials

The No Project Alternative avoids demolition or ground-disturbing activities that could potentially result in the release, transport, or disposal of hazardous materials. In addition, no new operations would be introduced to the site that could increase hazards. The project site would remain in its current condition, and impacts related to hazards and hazardous materials would be avoided. Although the proposed project would not result in any significant impacts after mitigation, the No Project Alternative would result in reduced impacts compared to the proposed project.

Hydrology and Water Quality

The No Project Alternative avoids any new construction activities that could temporarily impact water quality; nor would this alternative alter the existing site drainage in any way. This alternative includes no new structures that could be impacted by flooding or other hazards. Since the No Project Alternative avoids all new impacts to hydrology and water quality, impacts compared to the proposed project may be reduced. The proposed project could result in significant impacts; however, these potential impacts would be reduced to less than significant with mitigation as identified in this analysis.

Land Use and Planning

There are no land use changes for the project site included in the No Project Alternative. The existing zoning and land use designations would continue to apply to the site, and the 5.25-acre portion of the site would remain in the County of Solano instead of being annexed to the City of Vallejo. There would be no conflicts with existing land use regulations or policies; however, the site would not contribute to meeting any goals or policies since the site would remain vacant. The No Project Alternative would not result in any impacts to land use and planning and impacts; therefore, impacts would be similar to the proposed project, which would not result in any significant impacts.

Noise

The No Project Alternative avoids any construction or operations on the site that would increase noise levels above existing conditions. In addition, with no operations on the site, no transport of materials is required. When compared to the proposed project, the No Project Alternative would avoid all significant and unavoidable impacts from project related noise and would therefore result in reduced impacts compared to the proposed project.

Public Services and Recreation

The No Project Alternative eliminates all new employment on the project site and avoids new operations on the project site; it would therefore avoid any increase in demands for police, fire, or recreation services and facilities. The project site would remain vacant, and there would be no increase in users of the site. As a vacant site, there could be potential for vandalism or other property damage; however, increased police or fire services are not anticipated to patrol the area. Although the proposed project would slightly increase demands for police and fire, impacts would be less than significant. Therefore, the No Project Alternative would result in similar less-than-significant impacts as the proposed project.

Transportation and Traffic

The No Project Alternative would avoid an increase in traffic generated from the site since the site would remain in its current vacant condition. Impacts to surrounding intersections and all other transportation and traffic impacts would be avoided. When compared to the proposed project, which would have significant impacts reduced to less-than-significant levels with mitigation, the No Project Alternative would avoid all significant and unavoidable impacts from project-related transportation and traffic and would therefore result in reduced impacts compared to the proposed project.

Utilities and Service Systems

The No Project Alternative avoids any operations requiring utilities or service systems, including water, wastewater, stormwater, solid waste, electricity, and natural gas. With no increase in demand for these utilities and services, no new infrastructure would be needed that could potentially cause environmental impacts. Although the proposed project would not result in significant impacts to utilities and service systems, there would be an increase in demand and new infrastructure in some cases. Therefore, the No Project Alternative would result in slightly reduced impacts to utilities and service systems compared to the proposed project.

6.4.2 Revised Operations Alternative

Under the Revised Operations Alternative, the overall operations of the proposed project would be modified to decrease potential project impacts related to air quality, GHG emissions, and transportation and traffic. The Revised Operations Alternative would develop the project site in an identical manner as the proposed project; however, the operation of each project component would be altered, with the resulting reductions in impacts, as outlined below. These alterations to the project components include: (1) reducing the maximum length of trains used by the proposed project from 77 cars to 50 cars per train; (2) subjecting the VMT component of the project to a permit from the BAAQMD to regulate stationary on-site equipment, thereby subjecting it to BACT technology and making the VMT component eligible for NO_x offsets to avoid significant air quality impacts; (3) implementing a refined truck loading and weight confirmation system for the Orcem component to improve the efficiency of tanker trucks leaving the site that would increase the finished product loads from 25 to 26 tons; (4) revising operation of the VMT and Orcem components through ongoing fleet and equipment management activities to reduce NO_X emissions; and (5) offsetting any remaining VMT and Orcem emissions of NO_x, ROG, $PM_{2.5}$, or PM_{10} through purchase of credits in a BAAQMD-certified emission bank program to below a level of significance. A more complete description of these operational changes is described further below:

1. VMT would voluntarily be subjected to BAAQMD permitting for stationary equipment used on site for cargo handling. VMT would be required to achieve the following:
    a. For any equipment that emits over 10 pounds/day of a pollutant subject to BACT, stationary equipment would be required to implement BACT-level controls.
    b. Overall NO_x emissions for VMT would be reduced to achieve consistency with BAAQMD thresholds of 35 annual tons for stationary sources (without trucks).

   c. VMT would apply for and ensure implementation of NO_x emission "offsets" as administered through the BAAQMD to reduce stationary source emissions to zero.

   d. VMT would develop and implement BACT methodologies and equipment in accordance with applicable BAAQMD standards and policies, and subject to permit enforcement.

2. Refined truck loading and weight confirmation system would decrease truck volumes by 4% or 18 trucks per day, thereby further reducing NO_x, CO_2 and $PM_{2.5}$/PM_{10} emissions by a comparable percentage.

3. Operation of all activities associated with the VMT and Orcem components would be revised through ongoing fleet and equipment management activities to reduce the remaining NO_x emissions below the threshold of significance. Truck, front-loader, and other powered equipment would be subject to a Fleet and Equipment Management Plan (FEMP) designed to reduce the aggregate annual residual emissions of air quality criteria pollutants below applicable BAAQMD thresholds (as adopted by the City of Vallejo). It is expected that as the Orcem Plant transitions into its Phase 2 production mode and the VMT Terminal increases in transloading volumes beyond 60% of maximum, newer technologies will be made available for use on such equipment to reduce criteria pollutant emissions. VMT and Orcem would be obligated to implement the FEMP in such a manner as to reduce the emission levels per ton of goods shipped over time as total tonnage increases, with the goal of avoiding any threshold exceedance. This obligation would be incorporated in the Mitigation Monitoring and Reporting Program (MMRP) for annual monitoring and verification of compliance.

4. Following implementation of Components 1–3 above, VMT and Orcem would be obligated to offset any remaining air quality criteria pollutants (NO_x, ROG, $PM_{2.5}$, or PM_{10}) to reduce emission levels which exceed the applicable BAAQMD thresholds (as adopted by the City of Vallejo) through purchase of credits in a BAAQMD-certified emission bank offset program. This obligation would be incorporated in the MMRP for annual monitoring and verification of compliance.

5. Rail car assembly and movement activities associated with the VMT and Orcem components would reduce the maximum train length from 77 to 50 cars. Staging activities are to take place both on site and within the Cal Northern-operated "rail ladder" area adjoining the site. The reduced 50-car maximum length of trains traveling through Vallejo would reduce the individual time periods during which surface streets are blocked, and during which horns will be sounded. Aggregation of unit trains to 100 cars would take place outside of Vallejo within an appropriate industrial area.

6. VMT would take all appropriate steps to identify and implement a program for favoring contracts with operators which utilize barges, rather than trucks or trains, as their primary

means of moving goods. Most applicable to Phase 2 of the VMT Terminal operations (though not exclusive), this operational preference for barge traffic is intended to result in a corresponding reduction in truck and rail car volumes, with concurrent benefits of reduced truck traffic, reduced roadway and rail corridor noise, and reduced NO_x, $PM_{2.5}$, and PM_{10} emissions. VMT would actively direct their marketing efforts to attract operators which utilize barges and will implement a program to award contracts to barge users who are otherwise equally competitive with operators expecting to primarily utilize truck and/or train traffic. VMT would develop a Barge Preference Implementation Strategy (BPIS) for inclusion in the MMRP which will require annual monitoring and reporting of barge traffic by tonnage, as a percentage of terminal volumes. The goal of this program is to achieve an overall 25% reduction in truck and rail volumes as compared to the proposed project.

The Revised Operations Alternative would meet all of the basic objectives of the proposed project, since it accommodates the same level of throughput and, unlike the Reduced Truck and Rail Alternative ensures access to critical markets. Like the proposed project, the Revised Operations Alternative increases employment opportunities and tax revenues for the City. The Revised Operations Alternative would accomplish the following:

1. Achieve economic feasibility by not altering the volume of production or throughput for either the Orcem Plant or the VMT Terminal under Phases 1 or 2, including the objective of maximizing the potential for the manufacture of ground granulated blast furnace slag (GGBFS), a product that helps to meet the needs of the construction industry for high-performance, environmentally favorable concrete and sustainable building materials;
2. Fulfill other basic objectives of the project, including: (a) establishment of the VMT Terminal as a key site of multi-modal and intermodal transportation and logistics, thereby enhancing Vallejo's role in the regional and international trade economy; and (b) providing a means for locally manufactured products to be transported and distributed, increasing the viability of and the potential for attracting further manufacturing operations to Vallejo.
3. Reduce some of the potentially significant environmental effects of both proposed project components by implementing a coordinated set of related and interdependent alterations to the manner in which the project as a whole would operate.

Aesthetics

The Revised Operations Alternative would involve identical physical changes to the project site as the proposed project, including demolition of the existing structures on the site and construction of identical facilities for VMT and Orcem. Views of and from the project site would be similar to the proposed project with similar potential for impacts due to lighting (reduced through mitigation). However, this alternative would result in an increase in ship traffic and the number of days vessels would be docked at the VMT Terminal due to the shift away from trucks and trains for material transport. The presence of additional ships would not be considered a significant impact to aesthetics since ships and boats are frequent users of the waters surrounding the project site and would not detract from the existing visual character or quality of the site. For these reasons, aesthetic impacts from the Revised Operations Alternative would be similar to the proposed project.

Air Quality

The Revised Operations Alternative would result in the same construction emissions as the proposed project since this alternative includes the same facilities on the site. Construction air quality impacts would therefore be the same as the proposed project. Once operational, however, the VMT component of the project would voluntarily be subjected to a BAAQMD permit to regulate stationary on-site equipment. Orcem would also be subject to a BAAQMD permit, as in the proposed project. In addition, Orcem would implement a refined truck loading and weight confirmation system to improve the efficiency of tanker trucks leaving the site, by increasing finished product loads from 25 to 26 tons as explained earlier. NO_x emissions would be reduced through ongoing fleet and equipment management activities as explained earlier. Additionally, VMT and Orcem would offset any remaining emissions of NO_x, ROG, $PM_{2.5}$, or PM_{10} through purchase of credits in a BAAQMD-certified emission bank program to offset emissions for each of these criteria pollutants, to a level which would not exceed the threshold levels as identified in Table 3.2-6 of Section 3.2, Air Quality, and therefore reduce impacts to a level of less-than-significant. Overall impacts under the Revised Operations Alternative would be reduced compared to the proposed project, which would result in significant and unavoidable impacts to air quality during operations.

Most of the overall impacts under the Revised Operations Alternative would therefore be reduced to less than significant compared to the proposed project, which would result in significant and unavoidable impacts to air quality during operations. Impacts associated with annexation and use of the 5.25 acres to be annexed to the City for use by VMT would remain significant under the Revised Operations Alternative for the reasons stated in Section 3.2, Air Quality.

Biological Resources

The Revised Operations Alternative would involve the same construction activities as the proposed project and would therefore result in the same impacts to terrestrial and marine biological resources during construction. Similarly, during operations, potential impacts to biological resources under this alternative would be the same as the proposed project.

Cultural Resources

The Revised Operations Alternative would involve demolition of the same buildings and the same construction activities as the proposed project. Therefore, this alternative would result in the same impacts to cultural resources, including a remaining significant and unavoidable impact to historic resources due to demolition of the specified cultural resources on the site.

Geology and Soils

Under the Revised Operations Alternative, the project site would be developed in the same manner as the proposed project, and potential impacts due to geology and soils would therefore be identical. The potential impact due to slope instability would be reduced to less than significant with mitigation, as it would under the proposed project.

Greenhouse Gas Emissions

The Revised Operations Alternative would result in the same construction emissions as the proposed project since the same facilities would be developed on the site. Construction impacts would therefore be the same as the proposed project. Once operational, however, the VMT component of the project would be subjected to a permit from the BAAQMD to regulate stationary on-site equipment. Orcem would implement a refined truck loading and weight confirmation system to improve the efficiency of tanker trucks leaving the site, by increasing finished product loads from 25 to 26 tons. Operation of the VMT and Orcem components would be revised through ongoing fleet and equipment management activities to reduce GHG emissions, incrementally, as discussed in the preceding paragraph on Air Quality. Additionally, VMT and Orcem would offset any remaining emissions of NO_X, ROG, $PM_{2.5}$, or PM_{10} through purchase of credits in a BAAQMD-certified emission bank program to offset emissions below a level of significance, as discussed in the preceding Air Quality paragraph. Impacts under the Revised Operations Alternative would therefore be reduced compared to the proposed project, which would result in significant and unavoidable impacts to GHG emissions during operations.

Hazards and Hazardous Materials

The Revised Operations Alternative would involve the same construction activities as the proposed project and would therefore have identical impacts related to hazards and hazardous materials during construction. Operations under this alternative would be revised to address potential air quality impacts of the proposed project; however, the potential impacts to hazards and hazardous materials would be similar to the proposed project.

Hydrology and Water Quality

Under the Revised Operations Alternative, the project site would be developed in the same manner as the proposed project and would involve the same changes to site drainage and hydrology. Impacts would be mitigated to less than significant as in the case of the proposed project. Therefore, this alternative would have identical impacts to hydrology and water quality as the proposed project.

Land Use and Planning

The Revised Operations Alternative would involve the same land uses as the proposed project, including annexation and rezoning the 5.25-acre portion of the site that is currently outside the City of Vallejo city limits. This alternative would not conflict with any applicable land use regulations or policies. Therefore, impacts would be similar to the proposed project.

Noise

The Revised Operations Alternative would involve the same construction activities as the proposed project and would therefore have similar construction-related noise impacts. The noise associated with operations of the project is primarily due to the transport of materials to and from the site. The noise associated with transfer of incoming material by ship to export via barge would occur within the facility; whereas noise from truck operations and rail activity would affect surrounding neighborhoods. Reducing the length of trains from 77 cars to 50 cars by itself, would not have a noticeable effect on the 24-hour average noise of the project (day-night average sound level (L_{dn}) or community noise equivalent level (CNEL)) associated with rail activities. However, if VMT is able to incentivize an increase in the use of barges, as compared to trucks and rail, total truck trips and the related noise impacts would be reduced. Because there is not guarantee that VMT will be able to increase the use of barges, the Reduced Operations Alternative would have similar noise impacts as the proposed project, with the corresponding significant unavoidable impacts.

Public Services and Recreation

The Revised Operations Alternative would result in the same level of development and operations on the project site as the proposed project. Demands for police, fire, and recreation services and facilities would be the same as the proposed project. Therefore, this alternative would have similar less-than-significant impacts to public services and recreation as the proposed project.

Transportation and Traffic

The Revised Operations Alternative would reduce the length of trains from 77 rail cars to 50 rail cars. This would reduce the potential for traffic impacts due to trains since vehicle delays at rail crossings would be reduced compared to the proposed project. Therefore, this alternative would result in reduced traffic impacts when compared to the proposed project, but would have similar traffic impacts due to traffic delays as the proposed project, with the corresponding significant unavoidable impacts..

Utilities and Service Systems

The Revised Operations Alternative would result in the same level of development and operations on the project site as the proposed project. Demands for utilities and service systems would be the same as the proposed project. Therefore, this alternative would have similar less-than-significant impacts to utilities and service systems as the proposed project.

6.5 SUMMARY MATRIX

A matrix displaying the major characteristics and significant environmental effects of each alternative is provided in Table 6-1 to summarize the comparison with the proposed project. The matrix also indicates whether the alternative meets the project objectives as defined in Chapter 2.0, Project Description.

Table 6-1
Summary of Impacts from Alternatives

Environmental Issue	Proposed Project Impacts Prior to Mitigation	Proposed Project Impacts with Mitigation	No Project Alternative	Revised Operations Alternative
Aesthetics	S	LTS	▼	▬
Air Quality	S	SU	▼	▼
Biological Resources	S	LTS	▼	▬
Cultural Resources	S	SU	▼	▬
Geology and Soils	S	LTS	▼	▬
Greenhouse Gas Emissions	S	SU	▼	▼
Hazards and Hazardous Materials	S	LTS	▼	▬
Hydrology and Water Quality	S	LTS	▼	▬
Land Use and Planning	LTS	LTS	▬	▬
Noise	S	SU	▼	▬
Public Services and Recreation	LTS	LTS	▬	▬

Table 6-1
Summary of Impacts from Alternatives

Environmental Issue	Proposed Project Impacts Prior to Mitigation	Proposed Project Impacts with Mitigation	No Project Alternative	Revised Operations Alternative
Transportation and Traffic	S	SU	▼	▼
Utilities and Service Systems	LTS	LTS	▼	▬
Meets Most Project Objectives?	Yes	Yes	No	Yes

▲ Alternative is likely to result in greater impacts to issue when compared to proposed project.
▬ Alternative is likely to result in similar impacts to issue when compared to proposed project.
▼ Alternative is likely to result in reduced impacts to issue when compared to proposed project.
LTS = Less-than-significant impact.
S = Significant impact.
SU = Significant and unavoidable impact.

6.6 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

As indicated in Table 6-1, the No Project Alternative would result in the least environmental impacts and would be the environmentally superior alternative. However, Section 15126.6(e)(2) of the CEQA Guidelines states that if the environmentally superior alternative is the No Project Alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives. In this case, the environmentally superior alternative is the Revised Operations Alternative, since it would avoid several of the significant and unavoidable impacts to air quality and reduce impacts related to GHG emissions, and traffic. The Revised Operations Alternative would also meet all of the project objectives.

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CHAPTER 7
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CHAPTER 8
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