

3.0 Affected Environment

3.1 Traffic and Transportation Systems

This section presents an overview of the traffic and transportation systems in the vicinity of the Hercules ITC in Hercules, California, as well as along the broader I-80 corridor between the Carquinez and San Francisco-Oakland Bay Bridges. The existing transportation modes include roadways, railways, and pedestrian/bicycle trails.

The transportation portion of the proposed project includes development of a bus-to-train connection for an anticipated usage of up to 837 riders per day (Fehr & Peers 2009), extending John Muir Parkway, and providing a 220-space surface parking lot (on Block N) in the near-term. In the long-term, a transit area garage with approximately 450 spaces would be constructed. The proposed project would improve access to public mass transit and would be a benefit to the residents and workers in the vicinity of the Hercules ITC and the region. In fact, the majority of transit riders using the Hercules ITC are projected to come from the new residential units located within one-half mile of the transit center and the immediate surrounding cities and communities of Hercules, Pinole, and Rodeo-Crockett. Residents and commuters from the unincorporated communities of Contra Costa and Solano counties along I-80 east of Hercules are also likely to utilize the Hercules ITC. The traffic related to the proposed project would result in minor net benefit to the area-wide transportation systems that serve the seven-million people who live in the Bay Area. Detailed traffic discussion, therefore, focuses on the cities of Hercules, Pinole, and Rodeo-Crockett (the area of western Contra Costa County). The study area for the detailed traffic analysis extends beyond the project site itself for the purpose of analyzing potential project impacts, and is bounded by Willow Avenue to the north, Apian Way to the south, Interstate 80 to the east and San Pablo Avenue to the west.

3.1.1 Regulatory Framework

3.1.1.1 Local Plans and Policies

Measure C (1988) and Measure J (2004)

The current transportation planning approach in Contra Costa County began in 1988 with the passage of Measure C, which established a one-half cent sales tax in Contra Costa County to fund a specified set of transportation improvements. It also included a growth management element that established service standards for the transportation system and mandated that the standards be maintained on certain routes as growth occurs.

Measure C created the Contra Costa Transportation Authority (CCTA) as the agency responsible for implementing its provisions. Since 1998, the CCTA has further refined the Measure C policies and procedures through a series of published documents. Of particular importance to transportation analysis are their review requirements for General Plan amendments, which refer to “Action Plans for Routes of Regional Significance” that the County and the applicable regional agencies have agreed upon.

Measure C was renewed in 2004 with the passage of Measure J, which extends the sales tax for an additional 25 years (through 2034).

Contra Costa County 2007 Congestion Management Program

Under state law, the CCTA is responsible for preparing and adopting a Congestion Management Program (CMP) and updating it every other year. The most recent update was adopted on December 16, 2009. CMPs must contain level of service (LOS) standards for state highways and major arterials, measures to evaluate system performance, a seven-year capital improvement program, a program to analyze the impacts and costs of local land use decisions on the regional transportation system, and a travel demand element that promotes transportation alternatives to single-occupant vehicles. The CCTA has drawn the CMP performance measures from the traffic service objectives (TSO) in the Action Plans for Routes of Regional Significance. For roadways in the project vicinity, the CMP uses the TSOs established in the West Contra Costa County Action Plan 2000 Update.

West County Action Plan 2009 Update

Service level standards for “Routes of Regional Significance” are to be established through a cooperative process among jurisdictions and are to be institutionalized in documents called Action Plans. The West County Action Plan 2009 Update was adopted for the jurisdictions in western Contra Costa County. TSOs were revised for these facilities. The CCTA’s 2009 Congestion Management Program updated the TSOs and is used as the basis for evaluating transportation impacts on “Routes of Regional Significance.”

The following facilities in the project study area are considered “Routes of Regional Significance”: I-80, SR-4, San Pablo Avenue, and Willow Avenue. The primary TSOs that apply to all of the West County Routes of Regional Significance are:

- ◆ Maintain LOS¹ D or better at all signalized intersections along Willow Avenue;
- ◆ Maintain LOS E or better on all roadway segments of San Pablo Avenue and SR-4;
- ◆ Maintain LOS E or better on all roadway segments of SR-4;
- ◆ Maintain LOS E or better at all signalized intersections along San Pablo Avenue;
- ◆ Increase the I-80 HOV lane vehicle usage rate by 10 percent;
- ◆ Maintain a drive-alone rate of no more than 75 percent;
- ◆ Increase transit ridership in West County by 10 percent between 2007 and 2012;
- ◆ By 2012, increase the bicycle and pedestrian mode splits to 3 percent for commute trips;
- ◆ Maintain a 3,000 per day ridership on the Capitol and San Joaquin Corridor trains by the year 2005; and,
- ◆ Achieve a 500 per day ridership on the Hercules-San Francisco ferry line by 2012.

¹ LOS definitions are provided in **Table 3.1-1**

In addition to TSOs, the Action Plan contains actions that were cooperatively determined by the cities and the county to support achievement of the TSOs. One of these key actions required the local agencies to work with CCTA and MTC to actively pursue funding to expand bus service to/from Pinole, Hercules, Rodeo, and Crockett.

Three primary fee programs are in place to help finance improvements to transportation facilities within the study area. The City of Hercules assesses and collects a Development Impact Fee to support improvements to local transportation facilities. Two additional fee programs, the Hercules-Rodeo-Crockett Area of Benefit Fee and the West Contra Costa Sub-regional Transportation Mitigation Fee, are administered by the West Contra Costa County Transportation Advisory Committee. The City of Hercules traffic impact fee supports local capital improvements. The Hercules-Rodeo-Crockett and West Contra Costa fees administered by the county are assessed on new development in western Contra Costa County.

City of Hercules General Plan Circulation Element

The City's General Plan Circulation Element includes a policy of "... maintaining a Level of Service D or better for peak hour traffic operating conditions." (City of Hercules 1998a) The Circulation Element also presents a series of transportation policy statements; the policies with direct applicability to this EIS are reproduced below. Policy 2 on page II-20 of the General Plan provides:

"The policy on traffic level of service reflects the 'traffic service objectives' defined in the West County Action Plan. The City has adopted a Growth Management Element to comply with Contra Costa County Measure C (1988). This element includes adoption of level of service standards on 'basic routes' depending upon the location of the route: CBD (central business district), urban, suburban, semi-rural, and rural."

As noted in the Growth Management Element of the General Plan, the following are the traffic service standards for Basic Routes (Local Streets) in Hercules:

LOS "High" D to "Low" E (maximum volume-to-capacity [v/c] ratio is 0.94)²

- ◆ Sycamore Avenue (from Willow Avenue to San Pablo Avenue)
- ◆ Willow Avenue (from I-80 ramps to Sycamore)

LOS "High" D (maximum v/c ratio is 0.89)

- ◆ Sycamore Avenue (Highway 4 Freeway – Willow Avenue)
- ◆ Refugio Valley Road (Sycamore – Redwood/Falcon)
- ◆ Alfred Nobel Drive
- ◆ Linus Pauling Drive
- ◆ James Watson Drive

² LOS definitions are provided in Table 3.1-1

◆ John Muir Parkway

LOS “Low” D – (maximum v/c ratio is 0.84)

◆ All other Basic Routes (that is, except Routes of Regional Significance)

For health, safety, and general welfare, it is the City’s policy to provide adequate levels of traffic service throughout the City. Level of Service D or better is the citywide standard for traffic operating conditions during peak hours on residential streets and intersections. Level of Service D for the commercial/industrial development is acceptable under certain specified conditions.

New development is required to pay its fair share of the cost of improving regional routes so that compliance with the service standard specified in the Action Plan is maintained.

- a. Neighborhood design should discourage through traffic on local streets.
- b. Residential streets will be designed in relation to the needed capacity and the adjoining housing patterns.
- c. Proposed elements within view of designated scenic routes in the City should be reviewed in terms of their visual impact.
- d. The City shall actively participate in cooperative efforts to provide effective public transit to the City and adjacent communities, including promoting a commuter rail extension of BART in the City and a train station along San Pablo Bay within the Lower Refugio Valley serving the Capitol Corridor to intercept through travelers on I-80.
- e. The City should promote the establishment of riding and hiking trails throughout the community and coordinate with other agencies planning trail systems in the area and region.
- f. Minimize through traffic in residential neighborhoods.
- g. The City shall participate in and/or encourage the following planned capital improvements, as applicable:
 - ▲ Installation of ramp-metering hardware at all on-ramp locations on I-80;
 - ▲ Reconstruction of I-80/Highway 4 freeway interchange;
 - ▲ Construction of Highway 4 freeway; and
 - ▲ Widening of I-80 to include HOV lanes, Atlas Road to Carquinez Bridge.
- h. Additional transportation policies included within the Growth Management Element.

3.1.2 Intersection Level of Service Methodology

To evaluate the existing traffic conditions, the LOS was evaluated at critical intersections using the CCTA LOS Methodology.

The CCTA has adopted the Critical Lane Volume Planning Method described in Transportation Research Circular 212 to evaluate intersection levels of service (Transportation Research Board 1980). The CCTA has updated Circular 212 procedures to increase intersection capacity to 1,800 vehicles per hour from 1,500 vehicles per hour to account for local driving conditions (CCTA 2006).

Intersection levels of service using the critical lane concept are based on the volume of conflicting traffic (generally through movements versus opposing left turns) at the intersection during the peak hour of travel demand.

3.1.2.1 Level of Service Definition

LOS is a common measure of traffic operations using letters A through F to indicate the amount of congestion and delay. LOS A is free flow conditions, LOS D is typically considered acceptable for peak hour traffic periods in urban areas, LOS E is near or at capacity, and LOS F represents congested conditions above capacity.

The correlation between volume-to-capacity (v/c) ratios for signalized intersections is contained in Table 3.1-1.

Table 3.1-1 Signalized Intersection Level of Service Thresholds

Level of Service	Description of Traffic Conditions	Volume-to-Capacity Ratio
A	The approach to an intersection appears quite open and turning movements are made easily. Little or no delay is experienced. No vehicles wait longer than one red traffic signal indication. The traffic operation can generally be described as excellent.	0.00 - 0.60
B	The approach to an intersection is occasionally fully utilized and some delays may be encountered. Many drivers begin to feel somewhat restricted within groups of vehicles. The traffic operation can generally be described as very good.	0.61 - 0.70
C	The approach to an intersection is often fully utilized and back-ups may occur behind turning vehicles. Most drivers feel somewhat restricted, but not objectionably so. The driver occasionally may have to wait more than one red traffic signal indication. The traffic operation can generally be described as good.	0.71 - 0.80
D	There is increasing restriction causing substantial delays and queues of vehicles on approaches to the intersection during short times within the peak period. However, there are enough signal cycles with lower demand such that queues are periodically cleared, thus preventing excessive back-ups. The traffic operation can generally be described as fair.	0.81 - 0.90
E	Capacity occurs at LOS E. It represents the most vehicles that any particular intersection can accommodate. At capacity there may be long queues of vehicles waiting upstream of the intersection and vehicles may be delayed up to several signal cycles. The traffic operation can generally be described as poor.	0.91 - 1.00
F	LOS F represents a jammed condition. Back-ups from locations downstream or on the cross street may restrict or prevent movement of vehicles out of the approach under consideration. Hence, volumes of vehicles passing through the intersection vary from signal cycle to signal cycle. This volume would be less than capacity because of the jammed condition.	1.01 +

Source: Transportation Research Board, Circular 212, 1980

3.1.2.2 Impact Criteria

In the City of Hercules, LOS D or better (LOS A, B, C, or D) is the citywide standard for traffic operating conditions during peak hours on arterial streets and at signalized intersections. LOS D is the target service level most frequently adopted by jurisdictions in urban areas. However,

the City has adopted LOS E as the target service level for signalized intersections on San Pablo Avenue.

The City of Hercules General Plan defines a traffic impact as significant, if the addition of project-related traffic causes an intersection that operates at an acceptable LOS under pre-project conditions to operate at a lower LOS.

3.1.3 Existing Conditions

The area around the Hercules ITC is currently being redeveloped for residential and commercial uses. Over 1,392 residential units have been built in the area immediately south and east of the site as part of a mixed-use development. A total of 81,000 square feet of office space, 1,500 square feet of retail space, and 134,000 square feet of flex space have either been developed or are scheduled for development within one-half mile of the site. The area immediately to the north of the project site includes a research facility and established neighborhoods further to the north. The area to the east of the site, along San Pablo Avenue, includes strip mall commercial activities and other small commercial outlets.

Although the site of the Hercules ITC is currently undeveloped, the site was previously used extensively for the manufacturing explosives and fertilizers. Bayfront Boulevard, constructed as part of the adjacent subdivision development, is the only public vehicular access to the site. Security or construction activities may generate a small number of vehicle trips on working days, but there is no other existing vehicle traffic associated with the site. John Muir Parkway was recently partially extended but the roadway is not complete and will not open to the public until project completion.

3.1.3.1 Roadway Network

Regional access is provided by I-80 and SR-4. Local access is provided primarily by San Pablo Avenue, John Muir Parkway, Willow Avenue, and Sycamore Avenue along with other connecting roadways. These roadways are described below and are illustrated in Figure 3.1-1.

Regional Access

Interstate 80

I-80 is a six- to eight-lane freeway that travels in a northeast-southwest direction through the City of Hercules. Located just east of the project site, I-80 connects to SR-4 to the east, and serves as the main artery to Oakland and San Francisco to the south (west). HOV lanes are provided in both directions south of SR-4 and in the southbound direction to the Carquinez Bridge. The northbound HOV lane is under construction from SR-4 to the Carquinez Bridge. Local access is provided off of Willow Avenue and Sycamore Avenue. In the vicinity of the project, the peak hour traffic volume on I-80 is approximately 12,200 vehicles per hour and the average annual daily traffic is 182,000 vehicles per day (Caltrans 2008).

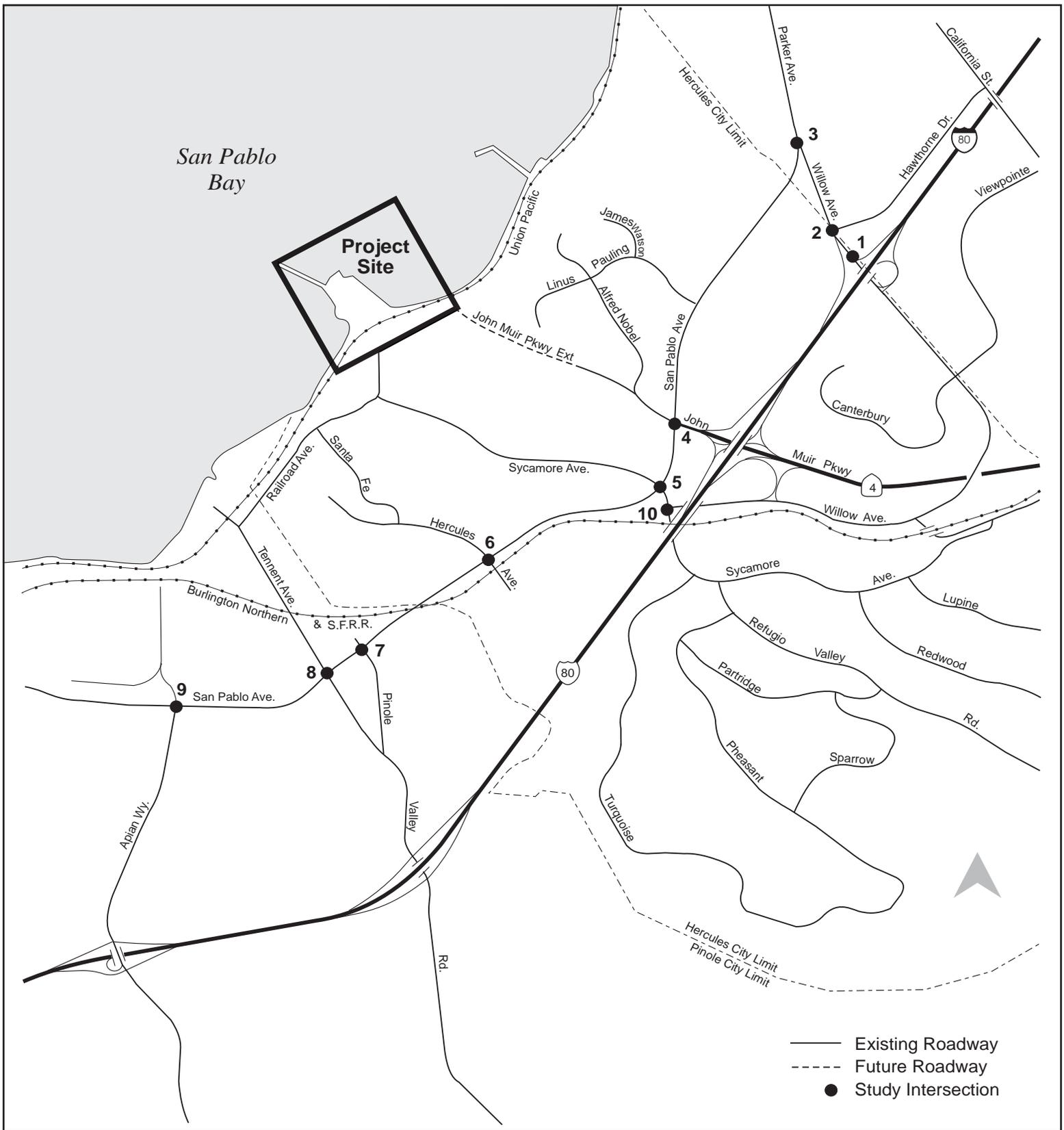


Figure 3.1-1: Site Location and Study Intersections

City of Hercules
 Hercules Intermodal Transit Facility
 Contra Costa County, California

Data Sources: Map information was compiled from the best available sources. No Warranty is made for its accuracy or completeness. Topographic Base Map, Aerial photography from ESRI ArcGIS Online; Hydrography from National Hydrography Dataset; NWI Data from U.S. Fish and Wildlife Service and soils data from USDA NRCS Soil Survey. Data is State Plane Feet, NAD83 Zone 3.



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According to the 2010 *I-80 Integrated Corridor Mobility Corridor System Management Plan*, “the demand on [I-80] exceeds the roadway capacity, causing unreliable travel times, erratic operating speeds, breakdowns, as well as diversion to the local arterials. The I-80 corridor has ranked as the most congested corridor in the entire San Francisco Bay Area since the mid-1990s.” Westbound I-80 experiences almost 4 hours of recurrent congestion (defined as a condition lasting for 15 minutes or longer where travel demand exceeds freeway capacity and vehicles are traveling at 35 miles per hour (mph) or less) during the morning commute; eastbound I-80 experiences 3 hours of recurrent congestion during the evening commute (DKS Associates, September 2010).

American Community Survey conducted a survey in 2006 for transportation mode split to work along the I-80 corridor. Single occupancy vehicle use in Hercules is second highest among the communities on the corridor, at 71 percent, exceeded only by Vallejo at 73.5 percent. Transit use is higher in the more southwesterly communities along the corridor (DKS Associates, September 2010).

California State Route 4

SR-4 is a four-lane expressway east of I-80 that travels in an east-west direction. West of I-80, the expressway terminates and becomes John Muir Parkway just northeast of the project site. Local access is provided off of John Muir Parkway. In the vicinity of the project, the peak hour traffic volume is approximately 3,300 vehicles per hour and the average annual daily traffic is 37,000 vehicles per day (Caltrans 2008).

Local Access

San Pablo Avenue

San Pablo Avenue extends through the City of Hercules in a north-south direction, running parallel to I-80 throughout western Contra Costa County and Alameda County. San Pablo Avenue serves as an unofficial reliever route to I-80, which is one of the most congested roadways in the Bay Area. Within the City of Hercules, San Pablo Avenue is a four-lane arterial, with separate left turn lanes at major intersections. The posted speed limit is 45 miles per hour (mph). CCTA has designated San Pablo Avenue as a “Route of Regional Significance.”

John Muir Parkway

John Muir Parkway is a four-lane roadway in the City of Hercules that extends from the SR-4 terminus, located west of I-80. While SR-4 is also referred to as ‘John Muir Parkway’ on some maps, the John Muir Parkway discussed in this document specifically refers to a local roadway between the North Shore Business Park and San Pablo Avenue. East of San Pablo Avenue, the John Muir Parkway provides access to I-80 eastbound and westbound, and to SR-4 eastbound. John Muir Parkway has recently been extended west to the Hercules ITC property line and a

new bridge has been constructed from John Muir to Tsushima Street. John Muir Parkway has a posted speed limit of 35 mph.

Sycamore Avenue

This arterial generally runs east-west between San Pablo Avenue and SR-4. West of San Pablo Avenue, Sycamore Avenue is a two lane collector with a posted speed limit of 25 mph. Exclusive left turn lanes are provided at major intersections and on-street parking is provided west of San Pablo Avenue. Sycamore Avenue has most of the retail/commercial activity in the City along its frontage. A recently completed striping project narrows Sycamore to two lanes in the vicinity of the Hercules City Hall and library.

Willow/Bayberry Avenue

Willow (formerly Bayberry) Avenue is a two-lane collector roadway primarily serving I-80 eastbound off-ramp traffic destined for Hercules. Willow Avenue runs east-west and currently extends between Sycamore Avenue and Palm Avenue. Vehicles exiting I-80 turn right onto Willow Avenue westbound to the Sycamore Avenue intersection. On-street parking is prohibited along the entire length of Willow Avenue, except for the Rodeo side. Willow Avenue is a four-lane arterial street that begins at San Pablo Avenue and ends at Sycamore Avenue. Willow Avenue provides access to I-80. It has a posted speed limit of 35 mph.

Hercules Avenue

Hercules Avenue is a two-lane local street (four-lane near intersection) serving primarily residential areas in the City of Hercules. In the vicinity of the project, Hercules Avenue indirectly connects Railroad Avenue to San Pablo Avenue.

Railroad Avenue

Railroad Avenue is a two-lane local street connecting Santa Fe and Bayfront Boulevard. This street currently fronts the proposed project site and is the western border of the existing housing development.

Santa Fe

Santa Fe is a two-lane local street serving residential areas that are in the vicinity of the project. This street connects Railroad Avenue to Hercules Avenue.

Tsushima

Tsushima is a two-lane local street serving the residential areas in the vicinity of the project. This street connects to Sycamore Avenue, John Muir Parkway, and San Pablo Avenue.

3.1.3.2 Transit Service

The WestCAT provides public transit service to communities in western Contra Costa County, including the City of Hercules. Currently, WestCAT does not provide service to the waterfront area where the proposed intermodal transit center would be located. However, most WestCAT bus routes operate out of the Hercules Transit Center which is located off Willow Avenue just east of I-80. Approximately 13 local, express, regional, and transbay routes operate out of the Hercules Transit Center. The Hercules Transit Center was recently relocated from San Pablo Avenue west of I-80 to its current location.

Transbay Service

The Lynx is a new commuter bus route that serves the Transbay Terminal in San Francisco directly from the Hercules Transit Center. The Lynx also provides service to the Victoria by the Bay neighborhood near Rodeo. Weekday-only service is provided during peak commuting hours in both directions. A one-way fare is currently \$5.00 (WestCAT 2009).

Regional Service

The Martinez Link 30Z is a regional bus route that provides service to the Amtrak station and Veterans Administration Hospital in Martinez, and the El Cerrito del Norte Bay Area Rapid Transit (BART) station via the Hercules Transit Center. Only weekday service is provided during commute times and the early evening hours.

Express Service

WestCAT operates express service between the Hercules Transit Center and the El Cerrito del Norte BART station. Transfers to and from BART trains are coordinated with the schedule. An alternating route pattern (JL and JR) is operated at all times with half of the buses stopping at Hilltop Mall Shopping Center in Richmond mid-route and the other half stopping at the Richmond Parkway Transit Center.

Route JX/JPX provides weekday-only commuter service. Transfers to and from BART trains are coordinated with the schedule.

Local Service

Local service throughout the City of Hercules is provided by eight bus routes and the Contra Costa College shuttle. Destinations include the Hilltop Mall Shopping Center, Richmond Parkway Transit Center, Contra Costa College, east Hercules, Rodeo, and Crockett. All routes run on weekdays only with the exception of Route 11 to Crockett/Rodeo and Route 19 to Hilltop Mall that also operate on Saturdays.

3.1.3.3 Railway System - Capitol Corridor Intercity Passenger Rail Line

The proposed Hercules ITC project would provide access to the Capitol Corridor intercity passenger rail line that runs immediately west of the project site. The Capitol Corridor line is 170 miles long and serves an area from Auburn, California (east of Sacramento) in the east, to Richmond, and San Jose/Diridon in the south. Capitol Corridor operates 16 stations in 8 Northern California counties: Placer, Sacramento, Yolo, Solano, Contra Costa, Alameda, San Francisco, and Santa Clara. Selected stations along the Capitol Corridor provide connection to the San Francisco BART system, Caltrain commuter rail line, and bus services. Twenty trains service the Capitol Corridor line each working day. Fares from San Francisco to Richmond (the first station past the Hercules ITC site) are \$10 one-way and \$165 for a monthly pass (Capitol Corridor 2010). BART provides day-to-day management support to the CCJPA, with input from Amtrak, the UPRR, Caltrans, and a variety of stakeholder agencies and communities.

3.1.3.4 Bicycle/Pedestrian System

In the vicinity of the project location, bicycle lanes are provided along San Pablo Avenue in Hercules. Sidewalks and curb ramps are provided throughout the residential neighborhood surrounding the proposed site, and pedestrian push button signals are provided at the signalized intersections along San Pablo Avenue.

The Bay Trail runs adjacent to the railroad tracks near the site. The Bay Trail is a planned recreational corridor that, when complete, will encircle San Francisco and San Pablo Bays with a continuous 500-mile network of bicycling and hiking trails. To date, approximately 290 miles of the alignment—over half the Bay Trail’s ultimate length—have been completed. The Bay Trail stops to the southwest of the project site where Santa Fe meets Railroad Avenue and to the northeast near the Victoria by the Bay neighborhood in Hercules. Both sections are paved and serve recreational users.

3.1.3.5 Ferry System

Although the currently proposed project does not provide access to the Bay Area Ferry service, WETA has an active proposal to develop a ferry terminal adjacent to the Hercules ITC. Environmental effects associated with a new ferry terminal will be addressed in a separate, stand-alone environmental document and permitted as a separate project. If developed, the Hercules Ferry Terminal would provide passenger-only ferry service to downtown San Francisco and be an additional transportation alternative. Development of the ferry terminal is evaluated in the cumulative effects analysis for the currently proposed project.

3.1.3.6 Intersection Level of Service

Intersections in the vicinity of the Hercules Intermodal Transit Center and the corresponding existing levels of service are presented in Figure 3.1-2 and Table 3.1-2. Intersection turning movement counts for the AM and PM peak hours were provided by City of Hercules staff.

According to the City of Hercules intersection LOS standards, all study intersections operate at acceptable levels of service.

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Table 3.1-2 Existing Condition Level of Service Summary

Intersection Number	Intersection	AM Peak Hour		PM Peak Hour	
		v/c Ratio ^a	LOS ^b	v/c Ratio ^a	LOS ^b
1	Willow Avenue/I-80 WB off-ramp	0.208	A	0.280	A
2	Willow Avenue/Hawthorne Drive	0.284	A	0.219	A
3	San Pablo Avenue/Willow Avenue	0.244	A	0.438	A
4	San Pablo Avenue/John Muir Parkway	0.427	A	0.594	A
5	San Pablo Avenue/Sycamore Avenue	0.674	B	0.616	B
6	San Pablo Avenue/Hercules Avenue	0.507	A	0.430	A
7	San Pablo Avenue/Pinole Valley Road	0.378	A	0.476	A
8	San Pablo Avenue/Tennent Avenue	0.536	A	0.559	A
9	San Pablo Avenue/Appian Way	0.297	A	0.565	A
10	Sycamore Avenue/Willow Avenue	0.808	D	0.865	D

^a v/c – Volume-to-Capacity Ratio
^b LOS – Level of Service
Source: DKS Associates February 2010

3.2 Land Use, Plans and Policies

This section provides a description of the regulatory framework for land use plans, policies, and regulations on a federal, State, regional, and local level. It also describes the existing and surrounding land use designations within the proposed project area.

The City is located in Contra Costa County along the eastern edge of the San Pablo Bay, approximately 22 miles northeast of San Francisco and 57 miles southwest of Sacramento. Hercules is bounded by the unincorporated town of Rodeo to the north, the City of Pinole to the south, unincorporated Contra Costa land to the east, and the southeast shoreline of San Pablo Bay to the west. The various land uses found within the city include industrial, commercial, residential, mixed-use, and public and open space lands. The growth of the city is greatly influenced by the overall population growth in the Bay Area.

3.2.1 Regulatory Framework

The regulations that govern the review and analysis of land uses and zoning designations found within the study area are described below.

3.2.1.1 Federal

National Environmental Policy Act of 1969

The proposed project would be developed consistent with NEPA requirements, which are contained in the Council on Environmental Quality (CEQ) NEPA regulations at 40 CFR 1500-1508. NEPA is a federal process through which environmental effects are analyzed. Because the proposed project will be implemented, in part, through federal funding, NEPA regulations apply, with the FTA acting as the federal lead agency. FTA's implementing regulations for NEPA can be found at 23 CFR 771.

3.2.1.2 State

California Environmental Quality Act

The CEQA Guidelines require project proponents to analyze the potential impacts of a proposed project to the environment and the project's consistency with local plans including the local general plan, existing zoning plans, and other applicable land use controls (CEQA Guidelines Section 15125).

The General Plan Guidelines published by the State Office of Planning and Research (OPR 2003) define consistency as follows: "An action, program, or project is consistent with the General Plan if, considering all its aspects, it will further the objectives and policies of the General Plan and not obstruct their attainment." Therefore, the standard for analysis used in this FEIS is based on general agreement with the policy language and furtherance of the policy intent (as determined by a review of the policy context). A project does not have to be in exact agreement with a policy for a project to be consistent with it.

3.2.1.3 Local

San Francisco Bay Plan - San Francisco Bay Conservation and Development Commission

The development along the city's shoreline is subject to the policies and regulations of the Bay Conservation and Development Commission (BCDC) as designated in the San Francisco Bay Plan (Bay Plan), as amended in 2008. The BCDC and the Bay Plan are the overseeing authorities in charge of the protection and conservation of the San Francisco Bay and its shorelines as a valuable natural resource. The BCDC jurisdiction is defined as the band of land 100 feet inland from the line of highest tidal action, estimated to be 6.2 feet National Geodetic Vertical Datum 29, and specified tributary creeks. The BCDC was granted regulatory permitting power within the shoreline areas in its jurisdiction by the state-legislated authority of the McAteer-Petris Act.

Development in the Hercules Point area and along the shoreline within the BCDC jurisdiction would require review by the BCDC Design Review Board, BCDC's approval of a development permit prior to any construction activity, and the city's review and approval process.

City of Hercules General Plan Land Use Element

The California State Legislature, pursuant to Government Code Section 65300, requires each city in the state to prepare a local general plan. The general plan is the primary planning document that establishes policies to regulate the development, function, and use of land within the boundaries of each city or county jurisdiction. With respect to the proposed project, the enhancement of an existing terminal or the development of a new one must conform to the policies of the local general plan.

The Land Use Element designates the proposed general distribution, location, and extent of land uses for housing, business, industry, open space, education, public buildings and grounds, waste disposal facilities, and other categories of public and private land uses.

The City's Land Use Element provides general direction and guidance for the physical development of Hercules. The following policies apply to the proposed project sites located within the City.

- ◆ Policy 1A –Encourage and only allow development that is consistent with the Land Use Diagram, Land Use Categories, and objectives, policies and programs of the Land Use Element.
- ◆ Policy 2A –Commercial and industrial development shall be consistent with gross intensity ranges in the Land Use Diagram and Land Use Categories. Higher intensity may be considered if such development is consistent with the City's goals and policies. However, each project with a proposed higher density would be subject to site-specific environmental analysis to determine incremental impacts.
- ◆ Policy 2B –Develop non-residential Land Use Categories, which reduce the need for residents to leave the community by providing a variety of shopping and service opportunities.
- ◆ Policy 8A – Preserve and enhance the historic district area.

- ◆ Program 8A.2 - A detailed study of the Historic Town Center and adjoining area (including Hercules Point) shall be prepared as part of the Planned Development application for properties within this area in order to define the appropriate mix of public and private land uses, design guidelines, preservation of key buildings, vegetation (e.g., trees) and trails.
- ◆ Program 8A.3 - Designate the Hercules Properties, Inc. parcels as a “special study area” requiring a “planned development” for mixed use and residential development. The planned development plan shall address:
 - Historic significance and existing historic buildings
 - Opportunities for and location of commuter rail station
 - Drainage and hydrology issues
 - Bay frontage location
 - Diversity of land uses
 - Coordination with adjacent properties needed due to diversity of land uses and complex infrastructure requirements.
- ◆ Policy 15A –Public, semi-public and non-profit uses may be allowed in commercial and industrial land use categories, if the type of use and level of activity is compatible with uses and activities allowed where industrial uses are allowed.

Land use designations within the project area include Public Park, Historic Town Center Waterfront Commercial, and Planned Commercial/ Residential. The Hercules Waterfront District Master Plan Initiative (discussed below) amended the land use designation of Hercules Point from Waterfront Commercial to Open Space and amended the permissible uses for Planned Commercial/Residential by increasing residential density to 40 units per acre and increasing allowable building height to a maximum of eight stories.

City of Hercules General Plan Open Space Element

Objective 1 - Provide adequate recreation, park and open space resources as the community expands.

Policy 1.a- Expand the community's park, trail and open space system to meet the demands of future growth. The comprehensive park, trail, and open space system shall provide linkages between developed and developing areas.

City of Hercules Zoning Ordinance – Waterfront District Master Plan

The WDMP serves as the zoning regulations for the Waterfront District, which includes the project site. The WDMP is a form based zoning code that facilitates and regulates development of the waterfront area, including the proposed project site. The vision for development under the WDMP is to create a fully functional pedestrian and transit-oriented community, where a multi-modal transit station, comprised of water ferry, train and bus transit, is the center of the plan. The WDMP envisions the multi-modal transit adjacent to Refugio Creek. The WDMP

acknowledges that the construction of the rail platform will require the realignment of Refugio Creek. In addition, the WDMP plans for the John Muir Parkway extension and construction of the Transit Loop and Bayfront Boulevard.

The project site, located entirely within the WDMP area, is subject to the following land use objectives, policies, and guidelines:

A WDMP for a 167-acre planning area was originally adopted by the City in July 2000 and has been amended several times, since its adoption. The overall intent of the WDMP is to facilitate development of the entire 167-acre Waterfront District “as a fully master planned and integrated community” (WDMP, section 1.2, p.3). The WDMP established five “Planning Sub-Districts.” These Planning Sub-Districts are: Historic Town Center, Transit Village, Central Neighborhood, Refugio Neighborhood, and Hercules Point. The project site is within the Historic Town Center Sub-District.

As paraphrased below, the stated specific land use purposes of the WDMP are to:

- ◆ Recognize, preserve, and re-use the historic structures of the Hercules Powder Company town site;
- ◆ Provide a network of public spaces that have access to views of Hercules Point and San Pablo Bay;
- ◆ Provide access along the Bay shoreline while preserving its natural resources;
- ◆ Provide a location for an intercity rail station with adjacent mixed-use development;
- ◆ Provide a variety of complementary office and retail uses;
- ◆ Accommodate both residential and commercial uses in a well-planned, mixed-use development;
- ◆ Provide a balanced mix of public spaces and facilities;
- ◆ Allow lower cost live-work opportunities for start-up businesses that are compatible with the District’s residential and commercial uses;
- ◆ Provide the opportunity for upper floor residential over ground-floor commercial uses;
- ◆ Provide careful design review to maximize the benefits of mixed-use development while minimizing its negative impacts; and
- ◆ Provide the opportunity for housing affordable to moderate- and low-income households.

By mid-2008, the Central (Promenade) Neighborhood and Refugio (Baywood) Neighborhood sub-districts of the 167-acre WDMP planning area and reached full build-out. On July 22, 2008, the Hercules City Council adopted a Waterfront NOW Initiative. The Initiative made amendments to the General Plan, Zoning Ordinance, and the WDMP. The changes were intended to further guide and facilitate build-out of the remaining undeveloped WDMP sub-districts, including the 42.36-acre Hercules Bayfront Project site and adjacent Intermodal Transit Center project site, both within the Historic Town Center sub-district, and the adjacent

Hercules Point sub-district. The adopted WDMP Initiative lists the following City land use objectives for these remaining undeveloped WDMP sub-districts:

- ◆ Promote and enhance the unique waterfront character and scenic resources of the Waterfront District through development of a transit-oriented neighborhood that includes walkable streets, a variety of dwelling types and businesses, and public plazas with views of San Francisco and San Pablo Bays;
- ◆ Implement the final stages of the WDMP through adoption of design and development guidelines for the Historic Town Center, Transit Village, and Hercules Point sub-districts that encourage a transit-oriented and pedestrian-oriented mix of uses along the Bayfront in the City of Hercules;
- ◆ Implement the goals and objectives of the WDMP by providing for the location of a Multi-Modal Transit System linking together rail service, a connection to downtown San Francisco via a ferry terminal, and bus service via WestCAT, making Hercules home to the first train, ferry, and bus center in California;
- ◆ Preserve and reuse existing historic structures within the Historic Town Center Sub-District—the Clubhouse and Administration buildings of the old Hercules Powder Company—and weave these historic buildings into the fabric of an architecturally cohesive and harmonized downtown Bayfront area;
- ◆ Assist the City of Hercules in meeting its housing needs for all economic segments of the population, while promoting the planning principles of New Urbanism and Smart Growth, by adopting detailed design and development standards for those areas within the Waterfront District that have not yet been developed;
- ◆ Amend the City of Hercules General Plan as necessary to provide for establishment of a transit-oriented, traditional neighborhood project that includes residential, commercial, retail, and public uses of unique architectural character within the Hercules Waterfront District;
- ◆ Enter into a Development Agreement, consistent with California law, providing for the long term planning and development of the Hercules Waterfront District; and
- ◆ Ensure that prior to further development of the Hercules Waterfront District, the City of Hercules, at the developer's expense, evaluates the environment impacts associated with such development.

The estimated build out of the remaining WDMP area includes 1,329 residential units, 134,000 sq. ft. of flex space, 81,000 sq. ft. of office, and 74,500 sq. ft. of retail.

The transit center is proposed to be located within the Historic Town Center district. The Historic Town Center district includes not only the transit center but also a mix of residential, retail and commercial uses.

City of Hercules Waterfront District Master Plan Initiative

The Hercules Waterfront District Master Plan Initiative was adopted by the City Council on July 22, 2008, and became effective in August 2008. Originated as voter petition in 2008 to have the Waterfront District Master Plan be considered by the City Council, the initiative

garnered greater than the 15 percent of registered voter signatures. As a result, the City Council adopted the initiative as an ordinance in July 22, 2008. The Initiative also modified the City's General Plan, Zoning Ordinance, and the WDMP and facilitates completion of the Hercules waterfront area as a transit-oriented mixed-use project by:

- ◆ Amending the General Plan, Zoning Ordinance, and WDMP to:
 1. Designate the Hercules Point as Open Space and allow both active and passive uses subject to any needed remediation;
 2. Allow mixed use neighborhood and residential uses and a multi-modal transit station within the Historic Town Center planning area;
 3. Add the Administration Building of the former Hercules Powder Company to the buildings to be retained for public or private use or access;
 4. Add marina use, including boat slips and docks, to the permissible uses for submerged and tidal land to the north and south of Hercules Point and permit inclusion of public rest room facilities within areas designated as Waterfront Commercial (WC);
 5. Increase allowable residential density to 40 units per acre and permissible building height to no more than eight stories within areas designated as Planned Commercial-Residential (PC-R); and
 6. Rezone property within various designated sub-districts, including bringing the Civic Arts building property and the Masonic building property within the Central Hercules Plan area.
- ◆ Amending the Waterfront District Master Plan by adding a Section 4 to establish a form-based code to regulate and provide detailed development and design standards for the currently undeveloped portions of the Historic Town Center, Transit Village, and Hercules Point sub-districts. The form-based code will only apply to those specific areas. The existing Waterfront Master Plan will continue to apply to other portions of the Waterfront Master Plan Area. The initiative will not apply to property that has already been developed within the WDMP Area or to land exempted from local regulation by State or Federal law.

City of Hercules Redevelopment Plan - Dynamite Redevelopment Project Area

The Dynamite Redevelopment Project Area includes goals to guide development and uses planned within the project area. Those goals relevant to the proposed project include:

- ◆ The assembly of land into parcels suitable for modern, integrated development with improved pedestrian and vehicular circulation in the project area.
- ◆ The replanning, redesign and development of undeveloped areas, which are stagnant or improperly utilized.
- ◆ The strengthening of retail and other commercial functions in the project area.

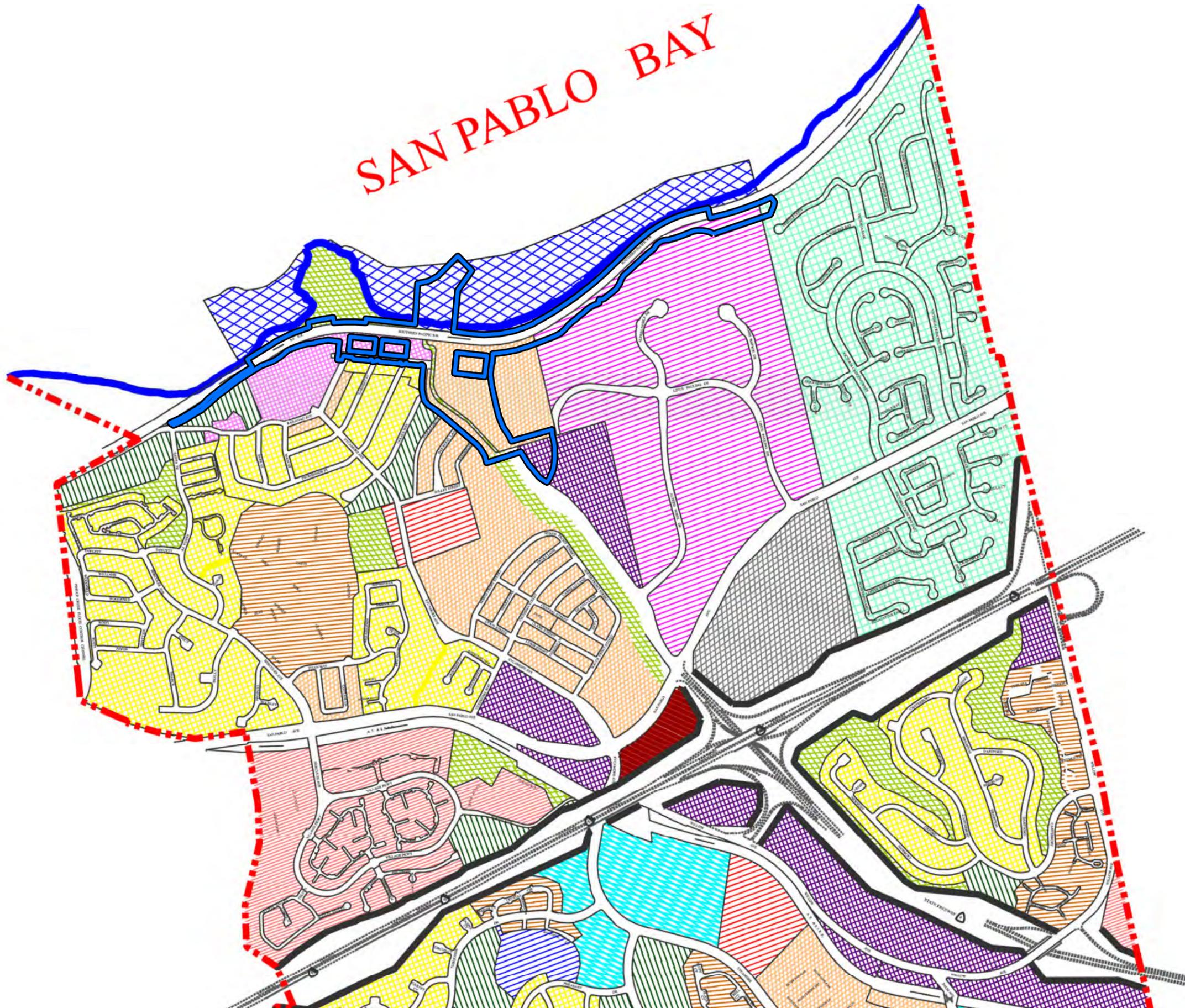
- ◆ The strengthening of the economic base of the project area and the community by the installation of needed site improvements to stimulate new commercial/industrial expansion, employment, and growth.
- ◆ The establishment and implementation of performance criteria to assure high site design standards and environmental quality and other design elements, which provide unity and integrity to the entire project.
- ◆ The expansion and/or improvement of the community's supply of low-and moderate-income housing.
- ◆ The preservation and restoration of historic structures.

3.2.2 Existing Conditions

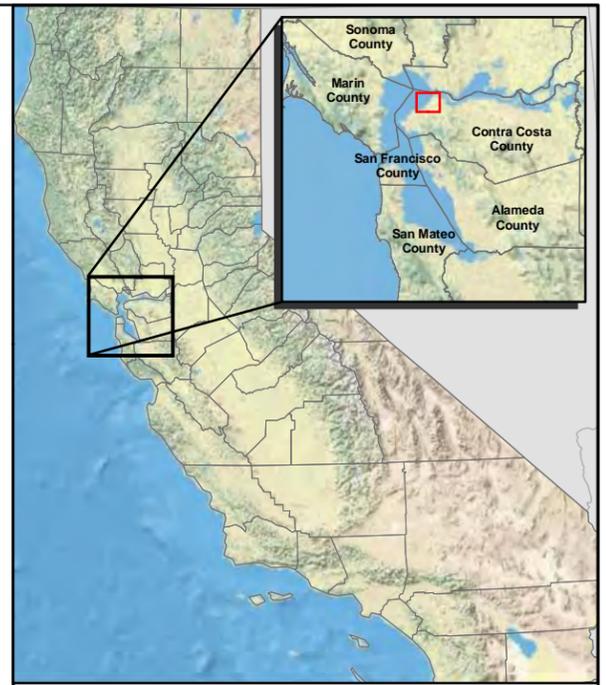
The proposed project site includes: a small portion of Hercules Point; approximately 4,000 linear feet of shoreline to the northeast, along the UPRR right-of-way; and an upland area east and west of Refugio Creek, extending from the rail line south to Bayfront Boulevard. In addition, the project site extends down Refugio Creek between the proposed John Muir Parkway Extension to the east and Sanderling Drive to the west from Bayfront Boulevard to the Waterfront District Boundary. The UPRR tracks and easement cross through the proposed project site in a northwesterly direction. The site is bordered on the north and west by San Pablo Bay, on the east by open land designated for residential and commercial development, and on the south by residential and commercial development.

General Plan Land Use Designations within the project area and zoning designations include Public Park, Planned Commercial/Residential, Historic Town Center, Waterfront Commercial, Public – Open Space, and General Commercial. The intent of these designations is to develop the proposed project site and surrounding areas as a transit-oriented community. Figure 3.2-1, City of Hercules Land Use and Zoning Map, shows the existing land use designations and zoning for the proposed project site and surrounding area.

The area of Hercules near the intersection of SR-4 and I-80 has been identified and designated by the City as a Priority Development Area (PDA) within the “Focusing Our Vision” (FOCUS) program, a multi-agency, regional planning initiative spearheaded by the Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC) in coordination with the Bay Area Air Quality Management District (BAAQMD) and Bay Conservation and Development Commission (BCDC). The goal of FOCUS is to support future compact and connected development patterns to identify priority development areas that accommodate growth through mixed-use, infill development near transit and job centers, with an emphasis on housing. The City in 2009 updated its General Plan and rezoned parcels within the Central Hercules PDA as “New Town Center District,” a mixed-use land use designation that allows pedestrian- and transit-friendly mixed uses, including a mix of residential, commercial, office, and public- and quasi-public uses commensurate with the areas central, crossroads location.



SAN PABLO BAY



- Legend**
- PROJECT BOUNDARY
 - FRANKLIN CANYON AREA
 - PUBLIC OPEN SPACE
 - PUBLIC PARK
 - PLANNED COMMERCIAL RESIDENTIAL
 - SINGLE FAMILY ESTATE
 - RESIDENTIAL MULTI FAMILY LOW DENSITY
 - COMMUNITY COMMERCIAL
 - NEW PACIFIC PROPERTIES SPECIFIC PLAN AREA
 - GENERAL COMMERCIAL
 - PLANNED OFFICE RESEARCH AND DEVELOPMENT
 - RESIDENTIAL SINGLE FAMILY LOW DENSITY
 - WATER FRONT COMMERCIAL
 - HISTORIC TOWN CENTER
 - PUBLIC CITY
 - COMMERCIAL PUBLIC
 - RESIDENTIAL MULTI FAMILY MEDIUM DENSITY
 - HERCULES INDUSTRIAL
 - HERCULES PUBLIC SCHOOLS

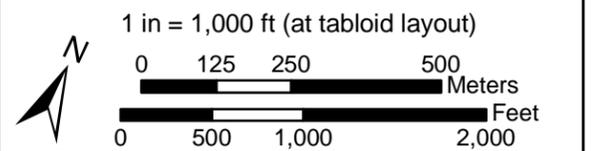


Figure 3.2-1: City of Hercules Land Use Map

City of Hercules
 Hercules Intermodal Transit Facility
 Contra Costa County, California

Data Sources: Map information was compiled from the best available sources. No Warranty is made for its accuracy or completeness. Land Use data from City of Hercules. Data is State Plane Feet, NAD83 Zone 3



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4.3 Socioeconomics and Environmental Justice

4.3.1 Methodology

Economic effects can be expected in the vicinity of the Hercules ITC when construction workers frequent local businesses, from construction traffic that delays business, or from transit riders who conduct business going to or from the transit center. Economic effects may extend to a larger area because construction materials and workers can be drawn from the regional, national, or even international market depending upon the scale and complexity of the project. For this project, any project related economic effects are expected to be experienced in both the project vicinity, as well as the greater San Francisco Bay Area because all of the construction materials and workers required to build and operate the facility are likely to be available within daily driving distance of the site.

Economic effects from project construction and operation are assessed to determine if they would have a reasonable likelihood of causing more than a minor effect within the area of potential effect, have been raised as an issue during the public scoping process, or are otherwise controversial. Social and economic effects typically addressed in NEPA environmental documents include changes to: population; employment; tax base; local businesses; housing communities and community cohesion; and community facilities.

4.3.2 Impact Criteria

4.3.2.1 Socioeconomics

Historical and projected data were analyzed to determine whether the project alternatives would result in potential impacts on employment, population, and housing. A socioeconomic impact would be considered adverse if the project would:

- ◆ Directly or indirectly induce substantial population growth;
- ◆ Displace or create severe hardship for a substantial number of people, housing, or businesses; or
- ◆ Disrupt or separate a neighborhood, including transportation improvements that could change traffic patterns.

4.3.2.2 Environmental Justice

For this analysis, the impact area is defined at the area within one-half mile of the project site. While the project would attract riders extend beyond the half-mile radius, any potential impacts on minority and low-income populations would be borne by those within one-half mile. The impact/study area for environmental justice encompasses the U.S. census tract block groups within one-half mile of the project site. As shown in Figure 3.3-1, the study area encompasses Census Tract 3591.01 (Block Groups 1 and 4 only) and Census Tract 3580 (Block Groups 1, 2, 3, and 4). Four of the five block groups in Census Tract 3580, which lie in the community of Rodeo just north of Hercules, are included; Block Group 5 is over a mile from the project area.

There are environmental justice populations within the study area because poverty rates are greater than that of county rates.

The potential effects of project construction and operation on the populations of concern residents need to be addressed in this environmental document to ensure that they are not disproportionately affected in terms of:

- ◆ Adverse effects to human health;
- ◆ Destruction or disruption of man-made or natural resources;
- ◆ Diminution of aesthetic values;
- ◆ Disruption of community cohesion;
- ◆ Adverse employment effects;
- ◆ Displacement of persons;
- ◆ Adverse effects to businesses or farms;
- ◆ Increased traffic congestion; and,
- ◆ Isolation or separation of low-income or minority individuals within a given community or from the broader community.

4.3.3 Impacts and Mitigation

4.3.3.1 No-Action Alternative

Under the No-Action Alternative, the proposed Hercules ITC would not be implemented. Consequently, the No-Action would not result in the construction of an intermodal transit center with a potential adverse impact on socioeconomics or environmental justice. Therefore, there would be no construction or operation impacts to socioeconomics or environmental justice, and they would remain the same as the existing setting.

On the other hand, without the implementation of the Hercules ITC project, there would be no additional transportation options and no improvements in access and mobility for the study area residents, including the low-income and minority populations that are more likely to be dependent on transit for mobility in and around the region. The No-Action Alternative would not satisfy the Purpose and Need, particularly the objective to provide intermodal connections for transport to/from jobs, recreational uses, educational opportunities, etc.

4.3.3.2 Action Alternatives

Because the two alternatives are very similar in size, location, and potential environmental effects, they are not differentiated in the socioeconomics and environmental justice discussions below. Accordingly, the two track options, A and B, will have no effect on the socioeconomic analyses of the Action Alternatives.

4.3.3.2a Potential Socioeconomic Impacts

Impact SOCIO-1: The project alternatives would not result in significant adverse socioeconomics impacts.

Alternatives 1 and 2

Construction of the proposed project is expected to employ roughly 600 workers during the construction period. Operation of the facility may employ a small number of workers. The proposed project includes development of a bus-to-train connection that is projected to serve 837 riders per day (Fehr & Peers 2009) and construction of a surface parking lot, and in the future, a transit area garage for up to 425 automobiles (Fehr & Peers 2009). The proposed project would improve access to public mass transit and would be an amenity to nearby residents and a benefit to workers in the vicinity of the Hercules ITC. Other than providing a transfer point for the proposed Hercules ITC, transit service to and from the nearby Hercules Transit Center is not expected to change as a result of the proposed project. The majority of Hercules ITC patrons are expected to come from the new residential units located within one-half mile of the transit center and the surrounding cities of Hercules, Pinole, and Rodeo-Crockett (Fehr & Peers 2009).

The San Francisco Bay Area is a large metropolis with over 7 million residents and a well-developed construction industry. Construction workers are likely to be available within the San Francisco Bay Area and would not need to move into the area for the project. Construction of the facility is, therefore, unlikely to generate a measurable increase in the population of the area. Operation of the facility would not directly generate more than a minimal number of jobs for maintenance activities or to work at the café, and these workers would likely come from the surrounding area as well. The project is unlikely to have more than a minor effect on population or employment in the area.

The Hercules ITC site currently does not generate any substantial tax revenues because it is undeveloped and no economic activity occurs on the site. Construction of the facility would generate minor tax revenues from the purchase of construction materials, income tax from workers, and spending in the local economy by construction workers. These tax revenues would be a minor benefit for the local jurisdiction and would end when the project is complete. Local businesses would experience a minor increase in activity during construction of the facility from sales of consumer goods such as lunches and other small items to construction workers and they may continue to experience improved sales to commuters using the facility. However, because the facility would serve fewer than 1,000 daily commuters, the volume of sales to commuters would be limited. Operation of the café would generate a small amount of tax revenues, but this is expected to be minor. Because the Hercules ITC would be a governmental activity, operation of the facility would not generate any tax revenues. Changes to tax revenues associated with the project would be minor.

Construction of the project would increase the demand for construction materials and workers, and local businesses would be able to compete for the construction contracts. Although the

cost to construct the project is expected to be roughly \$77 million, it would be a small project compared with other major public works projects in the San Francisco Bay Area. Local businesses would also experience a temporary benefit from spending by construction workers, but these effects are expected to be minor, temporary, and localized. Within the San Francisco Bay Area that constitutes the economic area of potential effect, these benefits would be minor.

Because the site is currently undeveloped, construction of the proposed project would not require the acquisition of any housing units and the project would not add to the number of housing units available in the area. As described above, the project is not expected to draw workers from outside the area, and the demand for housing would be unaffected.

The proposed project would provide a new access to public mass transit and this would benefit the newly constructed transit-oriented community located south of the Hercules ITC site, as well as the surrounding communities. Public transit could be expected to increase social interactions between transit riders and this would be a beneficial effect of the project. Because daily ridership is expected to be less than 1,000 people, this would have only a minor effect.

The proposed project would not include acquisition of any community facilities, nor would it change or deny access to any of these facilities. Because the project would not increase population in the area, it would not increase the use of any community facility.

The proposed project would provide a socioeconomic benefit by increasing transit options and improving transit services for nearby residents and businesses and this could reduce the time and cost of travel.

Track Options A and B

Socioeconomic effects of the Action Alternatives would be same under either Track Option A or Track Option B.

Mitigation

No mitigation is required.

4.3.3.2b Potential Impacts to Environmental Justice Populations of Concern

Impact SOCIO-2: The project alternatives would not result in disproportionately adverse impacts to minorities, ethnic groups, or low-income households.

Alternatives 1 and 2

As discussed below, because of the absence of significant environmental effects with mitigation, there would be no disproportionately adverse impacts to any environmental justice populations in the study area. Each type of environmental impact is briefly discussed below:

Adverse effects to human health:

Potential project impacts to human health effects include potential adverse air quality and noise effects. The results of the air quality and noise evaluations conducted for the Hercules ITC project, shown in Sections 4.7 and 4.8 of this document, found no adverse effect to either air quality or noise after the implementation of mitigation measures.

Destruction or disruption of man-made resources:

The project would redevelop a former explosives/fertilizer production site that is currently vacant and unused by the public. Selecting either of the action alternatives would improve the man-made resources at the site and would neither destroy nor disrupt any man-made resources that might be used by an environmental justice population. The former use of the site does not have any current impacts on any populations of concern.

Destruction or disruption of natural resources:

Selection of either Alternative 1 or 2 would not result in the destruction or disruption of any resource, including subsistence resources, currently used by members of an environmental justice population. The natural resources of the site are described in detail in Section 3.9 Biological Resources.

Diminution of aesthetic values:

The visual impacts of the project are described in Section 4.5 of this document. As discussed in this section, the aesthetic values of the site are expected to improve with construction of either of the action alternatives. Potential impacts from light and glare would be mitigated through a contractor-prepared *Final Lighting Plan*; however, any impacts would be not disproportionately borne by EJ populations.

Disruption of community cohesion:

Because the site is currently unoccupied and there is no public access through the site, the project would not divide communities or reduce access through the site, and constructing either of the action alternatives would not disrupt community cohesion. Construction of the Bay Trail through the site would improve access and might increase community interactions and strengthen community cohesion.

Adverse employment effects, displacement of persons, and adverse effects to businesses or farms:

Because the site is vacant, the proposed project would not reduce employment or require the displacement of any residents. There are no impacts to existing businesses or farmlands with the proposed project.

Increased traffic congestion:

As discussed in detail in Section 4.1 Traffic and Transportation, both Alternatives 1 and 2 would only slightly change localized traffic conditions as nearby residents travel to and from the Hercules ITC. There would be no change to the traffic patterns in the neighborhoods in proximity to the proposed Hercules ITC, and the localized traffic improvements would be implemented in order to accommodate access to the new transportation facility. Because the project increases access to public mass transit, traffic congestion in the broader community would decrease as additional commuters use the Hercules ITC and reduce trips by private vehicles. Additionally, the proposed project would not reduce public transit at the existing Hercules ITC. Localized traffic congestion would be a minor impact, but it would not fall disproportionately on the minority community in Hercules and the broader study area.

Isolation or separation of low-income or minority individuals within a given community or from the broader community:

The proposed project would not displace any residents, divide any community, or reduce access within a community. The proposed project would increase access from the south of the site to the north by way of the trail improvements and, at some point in the future, by connection of John Muir Parkway to Linus Pauling Drive.

Track Options A and B

With Track Option B, the Study Area extends north into the community of Rodeo (Census Tract 3580), where the percentage of minority populations is about the same (~56 percent) as the portion of the Study Area in the City of Hercules. Although there are populations of concern associated with Track Option B that are not associated with Track Option A, individuals that reside in the northeastern portion of the Study Area would not experience disproportionately adverse impacts with the proposed project. The improvements planned for this portion of the alignment will be minor and constructed within the railroad right-of-way. Also, the Hercules ITC project does not result in adverse environmental impacts within the entire Study Area for all populations. Moreover, the project would result in improved mobility and access to all residents, including the populations of concern.

Mitigation

No mitigation is required.

4.3.4 Cumulative Impacts and Mitigation

There would be no cumulative disproportionately adverse impacts to EJ populations, since there are no direct disproportionately adverse impacts as Section 4.3.3 discusses.

As the area redevelops and more people live and work at the site of the former Hercules Powder Company, the public transit access provided at the Hercules Intermodal Center can be expected to become a more valuable social and economic asset and the beneficial

socioeconomic effects can be expected to increase. With any new development, there are no anticipated adverse impacts to local and regional traffic and parking, and existing home values are not expected to be negatively affected in any way.

3.4 Cultural Resources

This section presents the regulatory framework for cultural resources (historic properties) and describes the project area of potential effects (APE). The prehistoric and historic period context sections provide information that allows for basic interpretation of cultural resources that occur in the area. The results of an institutional record search of the files of the Northwest Information Center (NWIC) and Native American Heritage Commission (NAHC) are presented as well as the results of a pedestrian survey.

3.4.1 Regulatory Framework

3.4.1.1 Federal

Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires federal agencies to take into account the effects of their undertakings on historic properties, and afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment. The historic preservation review process mandated by Section 106 is outlined in ACHP revised regulations, “Protection of Historic Properties” (36 CFR Part 800). The Section 106 process involves several steps. These include initiation of the process, identification of historic properties, assessment of effects and resolution of effects. To initiate the Section 106 compliance process, the federal lead agency first determines whether it has an undertaking. An undertaking is any type of activity that could affect historic properties, if they exist. Historic properties may include archaeological sites, buildings, structures, traditional cultural properties and objects that are included in the National Register of Historic Places or that meet the criteria for eligibility to that National Register. The lead federal agency initiates consultation with the State Historic Preservation Office (SHPO) after defining the area of potential effects (APE) and determining if any historic properties exist within the APE. To identify historic properties the agency reviews background information, consults with the SHPO, Tribes and others, and conducts studies as necessary. The federal lead agency provides appropriate documentation of its determination to the SHPO and, if no objection occurs within 30 days, proceeds with the undertaking having fulfilled its Section 106 compliance responsibilities.

To assess effects and the need for mitigation, a property must be determined either eligible or not eligible for the NRHP. If the property is eligible, then a determination of effect must be provided in accordance with 36 CFR 800. If a property is evaluated as not eligible, and the SHPO concurs with the finding, then no further work is necessary.

Eligibility for the NRHP is assessed using four evaluation criteria, as listed in 36 CFR 60.4. Eligibility rests on level of significance as measured and considered under these criteria. The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship, feeling, and association and that:

- ◆ Are associated with events that have made a significant contribution to the broad patterns of our history;
- ◆ Are associated with the lives of persons significant in our past;

- ◆ Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- ◆ Have yielded, or may be likely to yield, information important in prehistory or history.

Application of these evaluation criteria are used to determine what properties should be protected from destruction or damage resulting from project-related activities (36 CFR 60.2). Identification, evaluation and management of sites also encompass Native American values. The American Indian Religious Freedom Act, 42 United States Code (USC) 1996, has been enacted to protect Native American religious practices, ethnic heritage sites and land uses of federally recognized Native Americans.

3.4.1.2 Local

City of Hercules General Plan

The Land Use Element of the Hercules General Plan contains the following objectives, policies, and programs relevant to considerations of the cultural and historic resource impacts of the proposed project:

- ◆ Preserve Hercules history while developing its future. (Objective 8)
- ◆ Preserve and enhance the historic district area. (Policy 8A)
- ◆ Develop plans to preserve and rehabilitate key historic buildings but not the former plant equipment and manufacturing structures related to former industrial areas. (Program 8A.1)
- ◆ Designate the Hercules Properties, Inc. parcels as a “special study area” requiring a “planned development” for mixed use [sic] and residential development. The planned development plan shall address:
 - ▲ Historic significance of existing historic buildings
 - ▲ Opportunities for and location of commuter rail station
 - ▲ Drainage and hydrology issues
 - ▲ Bay frontage location
 - ▲ Diversity of land uses
 - ▲ Coordination with adjacent properties needed due to diversity of land uses and complex infrastructure requirements.

The Hercules Properties, Inc. parcels may be developed differently from the conceptual land uses depicted in the Land Use Diagram. (Program 8a.3)

In addition, the Open Space/Conservation Element of the Hercules General Plan contains the following objectives, policies, and programs relevant to the consideration of the cultural and historic resource impacts of the proposed project:

- ◆ Protect and preserve important historic and prehistoric resources. (Objective 12)
- ◆ Prehistoric resources shall be identified and preserved to the extent feasible. If previously unknown subsurface cultural resources are discovered during excavation activities on identified parcels or elsewhere in the study area, excavation would be temporarily halted and an archaeologist consulted as to the importance of the resources. Should the archaeologist determine that the resources are important, the project sponsor would follow the procedures described in Program 12a.2. (Policy 12a)
- ◆ Prior to development on Parcels [sic] in archaeologically sensitive areas identified within the Land Use Plan EIR, an attempt shall be made through a combination of archival research and in-field testing to identify areas that may have been use by Native American populations. Areas containing prehistoric deposits will be mapped; evaluation of their significance will follow only in those areas where future development might affect the resources. (Program 12a.1)

City of Hercules Waterfront District Master Plan

The WDMP does not contain addition specific policies or other provisions specifically relevant to cultural and historic resources. The WDMP Initiative, section 2 (Purpose and Findings), includes the following relevant purpose:

- ◆ 4. To preserve and reuse existing historic structures within the Historic Town Center Sub-District—the Clubhouse and Administration buildings of the old Hercules Powder Company—and to weave these historic buildings into the fabric of an architecturally cohesive and harmonized downtown Bayfront area.

3.4.2 Area of Potential Effect

The City is proposing to develop an ITC project in the City in the waterfront area (Figure 3.4-1). The project would include a new passenger train station on the existing Capitol Corridor line, a transit bus terminal, access roadways, and parking facilities. The project would serve commuters, visitors, students, and recreational users who desire an alternative way to travel to and from the City, the Bay Area and the Sacramento area to access employment, entertainment, and recreational destinations. Additionally, the transit center would provide connection to future development of ferry service within the Bay Area. The project would receive funding from the FTA. As a federally funded project, the project must comply with NEPA and the NHPA and its implementing regulations 36 CFR 800.

The project area lies adjacent to the existing UPRR grade along the southern shoreline of San Pablo Bay. It includes a portion of Refugio Creek, which flows north/south through the central portion of the project area, drains through a culvert and a bridge under the railroad, and enters the San Francisco Bay. The UPRR right-of-way is 100 feet wide with two tracks approximately nine feet apart. There are signals, utilities and pipelines, including a high pressure fuel pipeline, fiber optic and telephone cables, and electrical lines buried along the south side of the right-of-way. Realignment of some track will also be part of the project. Much of the project area is devoid of native vegetation. Other areas are covered with non-native grasses and weeds. There are no apparent natural unaltered contours within the project

area. A substantial portion of the project area is Holocene and historically placed fill (Welch 1977).

The horizontal APE is congruent to project area boundaries, which includes the boundaries for Track Option B. The undertaking will involve surface grading and demolition and removal of an existing small lift station. The vertical APE for the project will involve a range of depths. Utility emplacement will contribute to subsurface disturbance. The outlet for Refugio Creek would be straightened and channelized. The existing built environment is limited to the railroad and railroad bridge, an earth and rubble foot bridge and a lift station. The entire area has been filled and severely disturbed since the late 1870s. Also, the project area has been heavily surcharged with compacted, engineered dirt fill placed within the APE during grading for an adjacent residential development. Structures related to earlier use of the property such as the dynamite factory, and then a later chemical factory, have been demolished and/or removed.

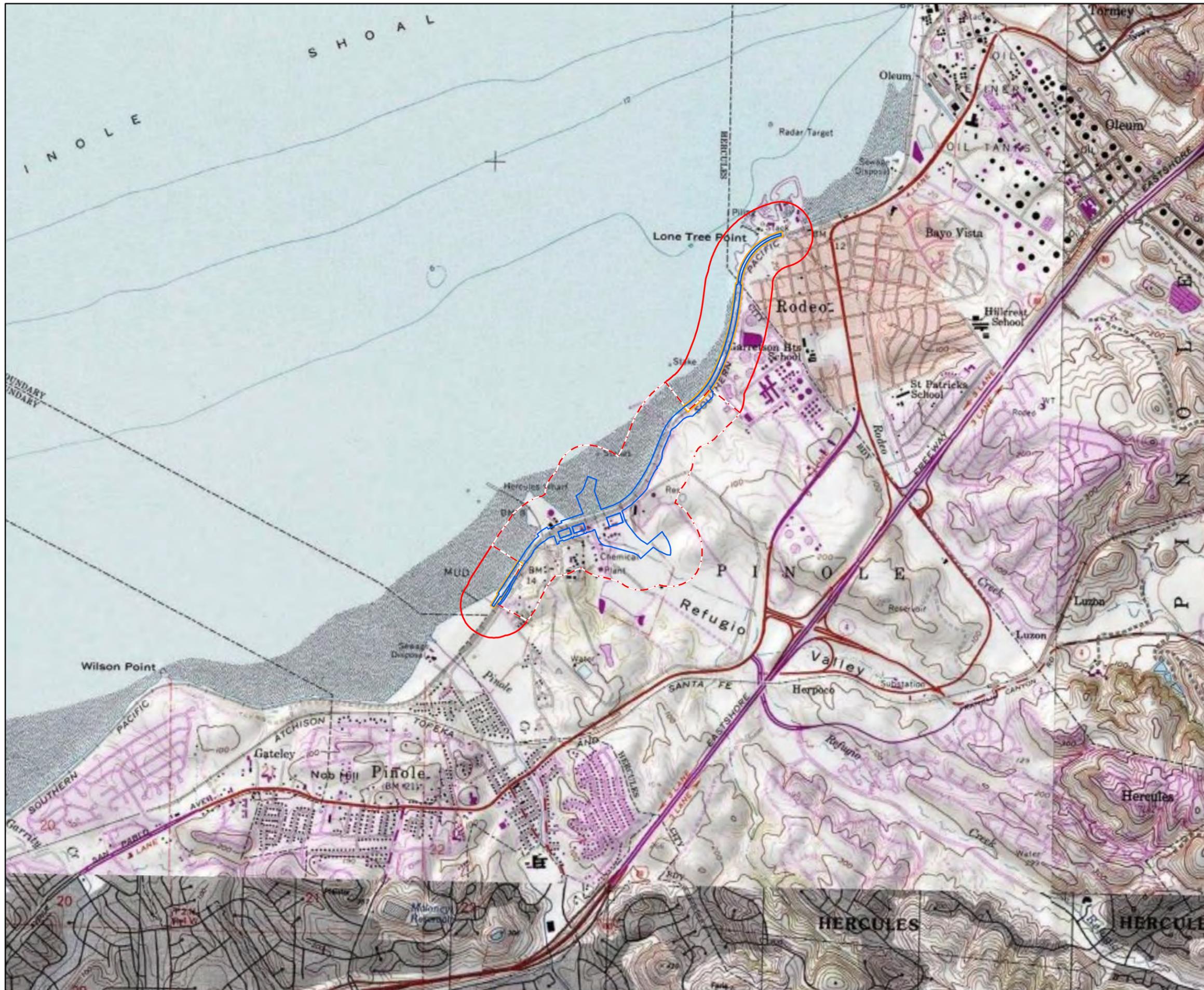
3.4.3 Setting

3.4.3.1 Paleoenvironment

The project area is situated within the Coast Range geomorphic province, which extends from Oregon to the north and the Santa Ynez fault to the south. The project area lies on the San Pablo Bay southern shoreline west of the Carquinez Straits. Much of the Coast Range is composed of marine and terrestrial sedimentary deposits underlain by either granitic rock or, as in the case of the project area, the Jurassic to upper Cretaceous Franciscan formation (Graymer et al. 1994).

The section of rocks along the southern shoreline between Pinole and Vallejo includes six of the most widespread divisions of sedimentary series in the Coast Range region. The formations or groups represented are the Chico (Upper Cretaceous), Martinez (Eocene), Monterey (earlier Miocene), San Pablo (later Miocene, Pinole tuff [Pliocene]) and overlying Pleistocene deposits. The project area is largely covered with both Holocene and recent period fill. However, at Hercules, broken shale of the Monterey group is exposed in a railroad cut. Fossils occur in all the formations of the San Pablo Bay section and at least six different faunas are reported. Pleistocene shale in the San Pablo section contains abundant marine shellfish remains as well as a variety of mammal bones representing elephant, horse, camel, bison, ground sloth, antelope, lion, wolf and other forms (Lee et al. 1916).

The Bay Area environment changed substantially over time. A relatively rapid sea-level rise occurred between 9,000 and 6,000 B.C. forming San Francisco Bay from the Francisco Valley. San Pablo Bay is part of San Francisco Bay. After 4,000 B.C. rising sea-level slowed and marshes developed around San Francisco Bay (Bickel 1978). Marshes are rich in food resources, including shellfish, fish and fowl. During this period numerous shell middens developed as a consequence of prehistoric period shellfish exploitation. Many of the marshlands surrounding the San Francisco Bay were established no more than 3,000 years ago (Moratto 1984). Due to the continually rising sea levels, most earlier-period sites may have been submerged or destroyed.



Legend

- EIR/EIS Project Boundary (APE)
- Track Option B Boundary (APE)
- 1/8 Mile Buffer from Track Option A (Study Area)
- 1/8 Mile Buffer from Track Option B (Study Area)

* Project located within Pinole - Martinez Land Grant area.

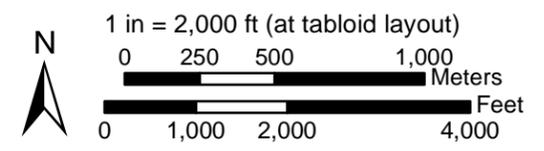


Figure 3.4-1: Cultural Resource Study Area and Area of Potential Effect (APE)

City of Hercules
 Hercules Intermodal Transit Facility
 Contra Costa County, California

Data Sources: Map information was compiled from the best available sources. No Warranty is made for its accuracy or completeness. Topographic Base Map, Aerial photography from ESRI ArcGIS Online; Hydrography from National Hydrography Dataset; NWI Data from U.S. Fish and Wildlife Service and soils data from USDA NRCS Soil Survey. Data is State Plane Feet, NAD83 Zone 3



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The most dramatic changes occurred during the 1855-1884 period of hydraulic gold mining in the Sierra Nevada. Mining-related sediments washed into many streams and a considerable amount of fine silt was carried into San Pablo Bay resulting in mud flat deposition and shoaling. Submerged prehistoric sites may have been buried during the siltation process. The nature of prehistoric period marshes and associated sites can only be inferred because of the substantial changes resulting from siltation. During the prehistoric period, the Bay Area featured a mosaic of plant communities ranging from salt marsh to redwood forest to grassland to mixed-evergreen woodland. The east bay plain was predominantly grass covered, with patches of brush and coast live oak groves. Vegetation was most dense along freshwater drainages which supported willow, California laurel, buckeye and oaks. Each community sustained its own array of animals, and game was generally abundant (Moratto 1984). For at least the last 10,000 years, with its abundant water supply and readily available food resources, the Bay Area would have been a favorable location for prehistoric period Native American occupation.

3.4.3.2 Prehistory

It is unknown when people first arrived in the Bay Area, but it is probable that occupation occurred at least 10,000 years ago. However, dramatic geomorphologic changes have occurred in the Bay Area landscape. Many of the landforms originally available for human habitation were either submerged beneath the sea as it rose to flood the Franciscan Valley, and/or were buried by sediments widely deposited around the margins of the Bay-Delta estuary and in the many inland valleys of the region (Nichols and Wright 1971, Meyer and Rosenthal 2007). There is, then, a bias in the recorded archaeological record. A significant portion of the archaeological record is simply not available for consideration or study. With a few important exceptions, archaeological sites dating older than a few thousand years have rarely been discovered in the Bay Area. Less than 15 percent of the radiocarbon-dated sites in this region are older than 4,000 years, and less than 5 percent are older than 6,000 years (Meyer and Rosenthal 2007).

Many of the early archaeological investigations in the Bay Area conducted between 1906 and 1908 by N. C. Nelson yielded the initial documentation of nearly 425 “earth mounds and shell heaps” along the littoral zone of the Bay (Nelson 1909). A number of these sites, also known as middens, were later excavated. Some notable sites include the Emeryville shell mound (CA-ALA-309), the Ellis Landing Site (CA-CCO-295) in Richmond, and the Fernandez Site (CA-CCO-259) in Rodeo Valley. These sites date less than 4,000 years old.

In 1948, Beardsley introduced the first regional chronology for the Bay Area (Beardsley 1948 and 1954). The chronology was originally devised to temporally organize sites in Central California, the Sacramento-San Joaquin Delta (Delta), and the northern San Joaquin Valley. Over time Beardsley refined his chronology and it became known as the Central California Taxonomic System (CCTS). The system relies on identification of particular patterns, such as burial configuration, shell bead and stone tool types and the tendency of sites to occur in certain settings. The system was later adapted for application in the Bay Area (Heizer 1954). Beardsley’s time periods or “Horizons” are listed below:

Paleoindian	earlier than 8,000 years ago
Early Horizon	8,000 to 2,500 years ago
Middle Horizon	2,500 to 1,100 years ago
Late Horizon	1,100 to 200 years ago
Historic	200 years ago or less

The CCTS does not work perfectly and some have debated its merits. Other scholars (Fredrickson 1973) have envisioned an alternative framework that groups sites differently:

Windmill Pattern	4,500 to 2,500 years ago
Berkeley Pattern	2,500 to 1,500 years ago
Augustine Pattern	1,500 to 150 years ago

Windmill Pattern sites are often situated in riverine, marshland and valley floor settings that offer a variety of plant and animal resources. These sites may contain burials that are extended ventrally and oriented to the west. Burial artifacts include a variety of fishing tools such as net weights, spear points and bone hooks as well as large and small mammal remains. Windmill Pattern sites may be associated with an influx of peoples from outside California who brought with them an adaptation to river-wetland environments (Moratto 1984).

Berkeley Pattern sites are much more common and well documented and are better understood than earlier sites. Although a riverine focus is common, Berkeley Pattern sites are distributed in more diverse environmental settings. Sites may include deeply stratified midden assemblages, which contain extensive milling tools and smaller, lighter projectile points. Assemblages may often have slate pendants, steatite beads, stone tubes and ear ornaments. Another distinguishing characteristic includes a shift in burial patterns including variable directional orientation, flex body positioning, and a general reduction in mortuary goods.

Augustine Pattern sites are characterized by evidence indicating intensive hunting, fishing, and gathering, a focus on acorn processing, large population increases, intensified trade and exchange networks, more complex ceremonial and social attributes than earlier patterns, and the practice of cremation in addition to flexed burials. Allan et al. (1997) indicate that certain artifacts also typify this Pattern including bone awls for use in basketry manufacture, small notched and serrated projectile points, the introduction of the bow and arrow, occasional pottery, clay effigies, bone whistles, and stone pipes.

3.4.3.3 Ethnohistory

When first discovered by Europeans, the Bay Area was found to be occupied by peoples the Europeans referred to “Costanos” since they lived along the coast (Kroeber 1925). The Project area was probably once occupied by Costanoans, however, the term Ohlone is preferred by their descendants. The Ohlone had a common language base, but were not a single political group. They did not have a single term in their language by which they referred to themselves as a whole (Levy 1978). The basic unit of Ohlone political organization was the tribelet, consisting of one or more socially-linked villages and smaller settlements within a recognized territory. The project area is located within the Chochenyo linguistic territory. Either the

Huchiun or Karkin tribelets possibly occupied the Hercules area; boundaries between the two are uncertain (Shipley 1978).

Based on archaeological and linguistic evidence, it is believed that Penutian-speaking peoples entered the Bay Area from the Delta region, displacing or replacing speakers of earlier Hokan stock languages of the Bay Area, such as Esselen (Kroeber 1925, Shipley 1978, Moratto 1984). The proto-Ohlone homeland was possibly located in the east Bay Area, possibly extending to the Carquinez Straits vicinity. By around 1,500 B.C., the Ohlone occupied most of the east shore of San Francisco Bay. Principal villages were typically established at the junctures of two or more biotic communities. Ohlone people had an intimate knowledge of their local environments and subsisted through a variety of activities including gathering berries, greens and bulbs, harvesting seeds and nuts, of which acorn was the most important, hunting for elk, deer, pronghorn and smaller animals, collecting shellfish, and taking various fishes in stream, bay, lagoon or open coastal waters (Moratto 1984).

3.4.3.4 History

The Spanish Period in the east Bay Area begins with the Pedro Fages expeditions in 1770 and 1772. He traveled from Monterey to the vicinity of the Berkeley Hills and described the Indians he met along the way. Cross cultural contact and the missionization activities of the Spanish led to the death of many Indians and the disintegration of Native American cultural lifeways. By 1810 it is reported that the traditional Ohlone villages had ceased to exist in the region (Levy 1978; Milliken 1995). Actual Spanish occupation of Hercules and the surrounding area is not recorded. Lands now encompassing the Project area were administered by the Mission Dolores in San Francisco between 1776 and 1823.

During the Mexican Period, Ygnacio Martinez obtained lands in 1824, which include the Project area. He received a land grant in 1842 and formed Rancho El Pinole (General Land Office 1868). His ranch, including what was to become Hercules, covered some 17,800 acres and extended between Point Pinole and Martinez. The first building in the area was the Martinez Adobe, which was situated in Pinole Valley to the southwest of the Project area (Bowman 1951)

The American Period begins in 1846 with the American victory in the Mexican-American war. Immigrants began to settle on rancho lands during and following the 1849 California gold rush. As with most Mexican land grants in Northern California, squatters and settlers began taking quasi-legal title to parcels of ranchland because American courts denied title to original Mexican grantees. With increasing population growth in and near Pinole in the 1850s-1870s, it became viable to construct wharfs, warehouse facilities, and a railroad to serve the area. Further, it also became viable to develop commercial and manufacturing facilities. The Burlington Northern Railroad Company constructed their line between Emeryville and Martinez in 1878 and built a station at the Pinole wharf. The Burlington Northern line was absorbed by the Southern Pacific Railroad Company in 1898. Transportation and shipping connections facilitated by the railroad allowed for continuing local growth and development.

The manufacture of explosives initiated the creation of the City. The California Powder Works (later to become Company) manufactured black powder, an explosive used mostly for the production of ammunition. In 1861 they opened their first plant near Santa Cruz and then opened a second plant near Golden Gate Park in 1869. With the growing population of San Francisco and the dangerous nature of their product, the company was forced to find a more rural location. In 1879, the California Powder Works Company selected lands which include the project area as a factory location due to its excellent transportation links, proximity to services in nearby Pinole, and the site's relatively isolated location. By 1881 a factory complex had been constructed and operations began in the Project area. The company provided homes and dormitories for its workers and a small company town developed at the location that later became the town of Hercules. The town incorporated in 1900. The company was purchased by the du Pont de Nemours Company in 1906, but in 1912 the purchase was overturned due to conflicts with the Sherman Anti-trust Act. The Company then became known as the Hercules Powder Company (Kyle et al. 1990, Holman & Associates 1993, Emanuels 1993).

In the first 38 years of operation in Hercules, 59 lives were lost due to accidental explosions. The nitroglycerine house and the building in which dynamite was produced, were the primary location of the blasts. In the largest explosion in its history, on February 1908, a total of 24 men, mostly Chinese workers, were killed in a single blast. The plant produced explosives, dynamite and trinitrotoluene (TNT) and provided these products during both World Wars. During World War I the Company was the largest such plant in the country, however, after the war, the demand for munitions plummeted. By 1964 a large facility had been constructed for the production of fertilizer and other chemicals. The company changed its name to Hercules, Incorporated, and stopped producing explosives and began producing fertilizers. Excess safety buffer zone lands were sold off since they were no longer needed. The fertilizer operation was closed in 1977 and many facilities were demolished (Holman and Associates 1993, W.A. Slocum & Co. and J.P. Munro-Fraser 2000).

In 1977, the City commissioned an architectural evaluation of remaining company buildings (Woodbridge 1979) and, as a result, the Hercules Village historic district was created in 1980 (Record #80000799). This district lies just south of the Project Area. No standing buildings or structures related to the Company remain intact within the APE.

3.4.4 Record Search and Survey Methodology

A record and literature search and pedestrian survey were completed to aid in identification of cultural resources within the study area. The record and literature search was performed at the California Historical Resources Information System (CHRIS), NWIC, California State University, Sonoma.. The record search was completed for the plotted area of potential effect encompassed by a 1/8 mile wide radius or buffer zone. The combined APE and buffer zone are designated as the study area. Research was performed by identifying and reviewing reports relevant to the study area, site record forms, historic period maps, and National Register of Historic Places and California Register of Historic Resources listings, and other publications.

In accordance with revised implementing regulations of the NHPA, Title 36 CFR Part 800.4(a) (4), HDR|DTA contacted the NAHC on January 3, 2010, to request a review of its Sacred

Lands file and to obtain a list of individuals or tribes that the NAHC believes should be contacted regarding information or concerns related to the project.

The purpose of an archaeological survey is to verify locations of previously recorded cultural resources, to assess their current conditions, and to examine all accessible lands not previously surveyed or which were surveyed to less than adequate standards to identify previously unrecorded archaeological sites that may be present in the APE. Archaeological surveys were completed on December 3, 2009 and April 3, 2010 by two qualified, professional archaeologists, who meet the Secretary of the Interior's Standards for professional archaeologists. The team participated in daily tailgate safety meetings prior to conducting the pedestrian survey.

Crew members walked parallel transects spaced no more than 15 meters apart. Visibility was excellent in some locations due to bare surfaces or scanty vegetation. Where vegetation prevented visibility or access, crew members they scraped the surface with a trowel to view exposed soil. All artifacts encountered during the field survey were left in place; no artifacts were collected.

Newly discovered cultural resources were fully documented. Previously recorded cultural resources were verified and re-recorded only when their existing site records or other documentation did not meet current standards for recording, or if the condition and/or integrity of the property had changed since the previous recordings. All cultural resources recorded during the survey were documented following the recordation procedures outlined in Instructions for Recording Historical Resources (OHP 1995), which utilizes State of California, Department of Parks and Recreation (DPR) forms DPR 523 A-L. This included preparation of scaled site sketch maps and photographic documentation of each site using digital photography. The locations of all archaeological sites and isolates were plotted onto the appropriate United States Geological Survey (USGS) 7.5-minute topographic maps both by hand and with a Global Positioning System (GPS) receiver using the Universal Transverse Mercator (UTM) coordinate system.

3.4.4.1 Record Search Results

Review of these reports indicates that less than 10 percent of the APE has been previously surveyed for cultural resources. Two previously recorded prehistoric period cultural resources were identified within the study area. These are described below:

P-07-000443, (CA-CCO-370): The site was recorded in 1978 by Michele Muse. The site record indicates that the site consists of a scatter of shell, bone, and charcoal. The sketch map indicates that a midden deposit is present. The site is in a highly disturbed area associated with roads and buildings. There is no indication on the site record whether or not the deposit is of prehistoric or historic origin. This site is partially within the study area, but outside of the APE.

P-07-002507, (CA-CCO-750): This buried prehistoric period site was identified during a fiber optic trench monitoring project and recorded by Tremaine and Associates in 2000. The site is within the study area. According to the site record:

“The site is a buried shell midden composed of very dark, wet clayey soil containing high density of mussel fragments. It was discovered during monitoring of the Long Haul Fiber Optic Project noted in a backhoe trench sidewall at 104-140cm below present ground surface. No other constituents were identified during limited dry screening through ¼” mesh. The areal extent of the site was not able to be determined. The deposit appears to be intact, but this too is difficult to determine for certain without extensive testing. It is possible that this midden was secondarily deposited during construction of the railroad grade. Level 3 Communications, the fiber optic company, was required to bore beneath the site to avoid additional damage. Before boring, it was necessary to locate buried utilities. These were found by various means, including using compressed air with a vac-truck and hand excavation. Spoils were wet-screened through ¼” mesh. Two Monterrey chert flakes were found along with a number of bird bone fragments, several fish vertebrae, miscellaneous bone fragments and one worked bone fragment. The site was eventually bored under to install the fiber optic cable. During boring several fractures occurred, forcing bentonite mud slurry through site fractures to the surface. These muds were screened but only fragments of shell was recovered” (Cervantes and Tremaine, 2000).

One excavation unit was also completed near the original trench find, confirming the presence of buried midden. Since the find is a buried phenomenon, its exact horizontal extent and presence within the project APE were unknown. To better understand the location of the site in relation to the APE, additional site boundary definition investigations were conducted in early 2012 by Far Western Anthropological Research Group. Twelve cores were drilled within the site area to determine site boundaries in relation to the APE. An intact subsurface archaeological deposit was identified in one core; a second core contained a dense concentration of redeposited site material (Far Western 2012).

Based on the results of work to date, site P-07-002507 is present within the railroad corridor at a minimum depth of 0.88 meters (2.89 feet) below surface; its maximum depth is estimated to be 2.0 meters (6.6 feet). In addition, the artificial fill and disturbed deposits that comprise the modern surface of the site area contain redeposited site material at a depth of less than 2.0 meters (6.6 feet). A portion of the site is intact, contains a diversity of artifacts, including a bone tool and the waste products from stone tool production, and subsistence remains of shellfish, bird and fish bone, and plant remains. It appears eligible for the National Register of Historic Places. Due to previous disturbance, the redeposited site material is likely not eligible, but may contain sensitive human remains (Far Western 2012).

The study area and APE encompass a portion of the historic period location of the Company, an explosives-producing firm operating in Hercules between 1881 and 1964. The location has not been formally identified as a historic archaeological site at the NWIC, but this is inferred as a result of an earlier building inventory (Myers, ed. 1977, Woodbridge 1988). Many buildings and structures were once located within the study area, but these are now demolished or removed. There may be buried remnants of the plant, including foundations or other buried factory related deposits. Nearby Hercules Village is listed on the National Register of Historic Places (Record Number 290075), and on the CRHR (4547-0003-9999), but does not include

any buildings within the APE (State of California Department of Parks and Recreation 1976, 2009). The location is recorded by the Contra Costa Historic Society as Historical Point of Interest #161 (Contra Costa County Historical Society 1994). Photos of historic-period Hercules are available at the Hercules Historical Society's website at www.herculeshistoricalsociety.org.

The UPRR (previously Southern Pacific, previously Central Pacific) grade that runs through the APE has not been formally recorded at the NWIC. Today the line is heavily used and maintained as a segment of the Capitol Corridor Rail System, however, a railroad has existed in this location since 1879. The railroad route through Hercules is shown on 1881 and 1887 maps (Rand McNalley & Co. 1881, G.W. & G.R. Colton & Co. 1887). Long term use and continuing maintenance have resulted in a road grade and tracks that are essentially modern features. However, the occurrence of bridges, signals, and other railroad-related sites or features over 50 years of age may occur along the margins of the present railroad grade.

The NAHC was contacted twice in 2010 due to the expanded APE for Track Option B. The NAHC responded on January 20, 2010 and November 23, 2010 with negative results for its search of the Sacred Lands file and a list of eight recommended contacts.

3.4.4.2 Survey Results

Some surface evidence of earlier land use was found which is summarized below. The finds all relate to either the Company or the UPRR. No evidence of prehistoric occupation was identified as a result of surface survey within the APE.

Hercules Powder Company Loci

HER-02-PC; Foundation, pipe channel: The feature is situated in an area of dense vegetation. There are twin, but non-matching, poured concrete abutments forming a channel, through which a 12" diameter ceramic pipe and a parallel cast iron pipe have been laid. There are an apparent valve and smaller steel pipes associated with the concrete abutments. Vegetation density obscures visibility and makes it difficult to interpret this feature. The weathered condition of the cement and associated fixtures suggest that the feature is over 50 years of age.

HER-03-PC; Retaining wall: The feature is a wall made of mortared brick and is exposed along the southern margin of a chain link fence at the outside southern edge of the railroad grade. The wall is four courses high and approximately 42 feet long. The wall is eroding out along its base and is broken off on one end. The wall may have been the edge of a loading dock or storage yard. The age of the feature is indeterminate, but it may be older than 50 years.

HER-05-PC; Culvert/foot bridge: The locus is situated in Refugio Creek bed. It consists of two large diameter riveted sheet steel pipes of approximately four-foot diameter covered on top with earth and cement rubble. The rubble covering is made up of soil and stacked concrete slab chunks and octagonally-shaped concrete pipe segments. There is no apparent prepared road or

trail on top of, or adjacent to, the feature. The age of this feature is indeterminate, but its components look older than 50 years of age.

HER-06-PC; Pilings: There are 6 wooden pilings driven into the bed of Refugio Creek. The pilings are set in a rectangular fashion within an area approximately 8' x 10'. The pilings rise about 3' higher than the water level. The pilings may have supported a small bridge, but no fittings or mounting bolts were noted. The feature is about 10' from either shore of the creek, which has standing water. The age of the feature is indeterminate.

HER-08-PC; Construction debris: The locus consists primarily of broken concrete and red brick in a pile approximately 6 inches in diameter and less than 1-inch tall. A recent period auto tire was also noted. Some of the brick and concrete may be older than 50 years of age, but the pile itself appears to be recent.

HER-09-PC; Abutment: The concrete feature is on a hillside bank south of, and adjacent to, the railroad road bed. The feature is a 10-foot-long concrete mass with a 22-inch steel plate mounted on its southwest end. The feature is at the approximate location of a now-demolished pier depicted on the 7.5-minute USGS quadrangle map for this area. It appears on a 1958 aerial photo so this feature is over 50 years of age. Based on examination of 1968 and 1980 aerial maps, the pier was demolished sometime between these two dates. The concrete feature is battered and weathered.

HER-13-PC; Pole stubs and construction debris: The find is situated in a branch of Refugio Creek. It consists of two rotted-off wooden pole stubs situated 32' apart. There is an associated light scatter of broken red bricks. This feature is of indeterminate function or age.

HER-14-PC; Road, trail: This feature is a segment of the bayside trail (undeveloped Bay Trail), which runs south of the railroad road bed between the western margins of the project area to a point just southwest of the Hercules Wharf. The single-lane road/trail is mostly asphalt-paved. It may have once been an access road to the Company and is visible in 1958 aerial photographs. The road is of unknown age.

HER-24-PC; Pier remnant: This feature is a concentration of very large pieces of concrete rubble. It extends northward about 20 feet from the railroad grade into San Pablo Bay. It is about 15 feet wide. The area appears to be used by fishermen, who have erected a plywood shelter and chairs on the pier remnant. There is also evidence of recent camp fires. The feature lies just north of find HER-09-PC, an in-situ abutment. These two features may have been a support element of a pier that is shown on the current Mare Island 7.5-minute USGS map, but has since been demolished and removed.

Union Pacific (formerly Southern Pacific) Railroad-related Loci

HER-01-RR; Foundation and slab: This feature with two elements lies adjacent to the railroad grade bed. It consists of a poured concrete slab and an adjacent, long, narrow but larger concrete foundation with wall footings. The large foundation measures 12 feet by 56 feet. The smaller poured slab measures 5'4" wide x 12'. The larger foundation has strips of

heavy steel plate set into it. It also has an inset steel access box with steel cover. The larger foundation's interior is covered with gravel. The smaller slab has wall delineations and inset wall mounting bolts. It also has inset plate mountings patched-in sometime after initial construction. One mounting plate has surrounding patch concrete, dated August 21, 1957. The 4-inch inset pipe within the smaller slab goes down into a hollow chamber at least 3 inches in depth. The feature is probably a utilities vault and is over 50 years old.

HER-04-RR; Foundation: The feature is adjacent to the railroad grade. The foundation is a 3' 6" square concrete slab. The structure's framing, now lying flat, is made of 14-inch steel I-beams. There is evidence of recent welding on one of the beams. The feature is of apparent recent age as it lacks substantial corrosion.

HER-10-RR; Foundation, railroad signal mount: This roughly 3-foot-square feature is south of, but near the railroad road bed. The feature is made up of concrete posts stacked to support concrete frames. The top of the feature has four mounting bolts. It is of indeterminate age.

HER-11-RR; Foundation, railroad signal mount: The feature is very much like RR-10, but smaller. It is close to the railroad grade and is essentially 18 inches square and has 4¾-inch mounting bolts. It is of indeterminate age.

HER-15-RR; Wooden railroad bridge: This feature is intact, and today supports the modern day railroad as it crosses Refugio Creek. The railroad bridge is 30 feet long and is supported by wooden pilings. The superstructure is made of heavy milled lumber. It is at least 100 feet wide and now supports two set of railroad tracks. Part of the structure on the south side is not currently in use and is partially exposed through erosion. A bridge is indicated at this location on 1958 aerial photographs.

HER-25-RR; Signal mounts and survey marker: The locus consists of four two-foot x two-foot concrete blocks. Two are on the north side of the double tracks in the location and two are on the south. The blocks are 10 feet apart and each has four inset mounting bolts. The blocks probably once supported an overhead track signal. The location is adjacent to an in-use signal house referred to as "CP RV 020/PINOLE". One of the blocks has an inset brass survey marker embossed "U S COAST & GEODETIC SURVEY," and dated 1936.

HER-26-RR; Abandoned utility line: A number of sawn-off wooden utility pole stubs were noted along the north side of the railroad. Two standing by badly weathered poles were noted in a marshy area west of Hercules Point. The pole stubs are about 10 to 12 inches in diameter.

Paleontology Locality

HER-29-PAL: The project area has exposures of the middle Miocene Hanbre Sandstone (Th), artificial fill (af) and the Miocene Cierbo Sandstone (Tc). Fossilized bivalves and a gastropod were noted in a railroad cut and bayshore exposure near the eastern portion of the project area. No evidence of vertebrate fossils was noted. Formations were identified using The Geological

Map and Map Database of Northeastern San Francisco Bay Region, California (Graymer et. al. 2002).

3.5 Visual and Aesthetic Resources

This section provides a description of the regulatory framework for visual and aesthetic resources on a local and regional level. It denotes if there are controlling regulations that restrict or guide the design of new infrastructure in terms of height and bulk, materials, visual setbacks, obstruction of scenic vistas, degradation of the visual quality of the site, and the effects of light and glare. It also describes the visual quality of the area around the proposed project site, including views and viewpoints, depth of perspective, and color and texture of the visual setting.

3.5.1 Regulatory Framework

3.5.1.1 City of Hercules General Plan

The following goals, objectives, policies, and programs in the General Plan relevant to visual quality would apply to the proposed project.

Open Space/Conservation Element

Objective 1.d: Plan for the preservation and enhancement of visual qualities as viewed from scenic routes.

Objective 13: Preserve and enhance scenic views within the community.

Policy 13a: Development proposals shall be reviewed in terms of natural objects in the vicinity that have aesthetic significance. This may include open space, eucalyptus groves, or vegetation that serves as a view corridor or has important visual attributes. Development proposals shall be sited to ensure that these features are retained or replaced to the extent feasible, resulting in minimal view impairment.

Policy 13b: Plantings that serve to screen views of residential development, or that help to maintain a natural-appearing landscape, shall be retained to the extent feasible. Such plants could be thinned selectively if thinning would improve view corridors. If specific trees are to be removed, such as eucalyptus trees, replace with trees, preferably native species, that will provide suitable screening while retaining important view corridors, especially along San Pablo Avenue which is a designated scenic corridor.

Policy 13d: Development shall preserve important view corridors, where feasible, by identifying and preserving the attributes of the view corridor that characterize its significance (e.g., framing elements, surface water reflections, presence or absence of impinging details) as seen from roadways, pedestrian paths, or other public vantage points to avoid view obstruction. Buildings shall be sited so as to minimize view obstruction from sensitive viewpoints.

Program 13d.1: The following views, from publicly accessible viewpoints, shall be preserved to the maximum extent feasible as the City evaluates new development on a parcel-specific basis as identified within the Land Use Plan EIR:

- iv. San Pablo Avenue views of specimen oak tree stands and, where feasible, eucalyptus;

- v. views of San Pablo Bay, Hills of Marin, Sonoma and Napa Counties, and inland of the Briones Hills.

Policy 13e: New development shall be designed to minimize light and glare impacts.

Program 13e.1: The City shall evaluate the light and glare potential of new development on a parcel-specific basis and apply the following measures:

- ◆ Screening of parking areas by using vegetation or trees. This will reduce the amount of glare generated from painted and chrome automobile surfaces and prevent expanses of stationary and moving automobiles.
- ◆ Hooded lights for nighttime illumination should be used for parking areas, shipping and receiving docks, and industrial development. Hooded lights direct the light beam towards the ground, which if a dark pavement, will not reflect light and cause spillage into neighboring uses.
- ◆ Regular windows should be used instead of the glass walls or massive reflective windows often used for research and development and office park developments.

Land Use Element

Objective 7: Achieve a pattern of development that is consistent with the City's desired image.

Program 7.A.1: Provide landscaping along major regional streets and highways.

This landscaping should soften the appearance of traffic and parking along those routes, while allowing view corridors to retail and other businesses.

Objective 9: Promote attractively designed and economically feasible development.

Objective 13: Attain compatible land uses within existing and planned development areas.

Circulation Element

Objective 2: Plan for the preservation and enhancement of visual qualities as viewed from designated scenic routes.

Policy 2d: Proposed elements within view of designated scenic routes in the City should be reviewed in terms of their visual impact.

3.5.1.2 Hercules Zoning Ordinance

Scenic Road and Highway Overlay District (Chapter 25)

The purposes of the Scenic Road and Highway Overlay District of the City's Zoning Ordinance are to implement the scenic road and highway designations of the General Plan; review the visual impact of development proposals within view of designated scenic routes; and encourage aesthetically attractive architecture, design, landscaping, and signage for new or expanded

development. The Overlay District requires that a number of specific performance standards be met for architecture and design, landscaping, and signage. Performance standards for architecture and design include, but are not limited to, the clustering of structures around a common plaza or other open space entry feature, and to articulate elevations to reduce the visual impact of building mass and bulk. Desirable landscape and hardscape qualities consist of front and side yards landscaped with groundcover and trees that soften building edges, landscaped and screened parking areas, and plazas or other open space entry features. Finally, a sign plan is required for all new or expanded development within the overlay district. Signage should be attractive and low profile, fitting into the design theme of the buildings and landscape. The nearest designated scenic roads to the project site are San Pablo Boulevard and SR-4.

Performance Standards (Chapter 31)

This chapter establishes specific performance standards for development, uses for certain zoning districts, and general performance standards that apply to all zoning districts. The performance standards relevant to aesthetics require potential light and glare from new development to be attenuated on a parcel-specific basis. The measures listed below help to keep glare on site and prevents it from "spilling over" to adjacent uses.

- ◆ Screen parking areas with vegetation or trees to reduce the amount of glare generated from painted and chrome automobile surfaces.
- ◆ Use hooded lights for nighttime illumination at parking areas, shipping and receiving docks, and industrial development. Hooded lights direct the light beam towards the ground where dark pavement will not reflect light and cause spillage into neighboring uses.

Design Review (Chapter 42)

The "Design Review" chapter has the following purposes:

- ◆ Improve the general standards of orderly development in the City through design review of individual buildings, structures, and their environs.
- ◆ Improve and augment planning and building controls to promote development that is in the best interest of public health, safety, and welfare.
- ◆ Establish standards and policies that promote and enhance good design, site relationships, and other aesthetic considerations in the City.
- ◆ Preserve and enhance property values and the visual character of the City.

The "Design Review" chapter requires that the Hercules Planning Commission approve the design of a public or private building, fence, structure, or sign prior to the issuance of any construction permit. The Planning Commission's design review approval must be supported by a number of findings: the approval is in the best interest of public health, safety, and general welfare; general site considerations (layout, open space, orientation, and location of buildings, setbacks, height, walls, fences, etc.) have been designed to provide a desirable environment;

general architectural considerations have been incorporated to ensure the development's compatibility with its design concept and the character of adjacent buildings; and general landscape considerations have been taken to ensure visual relief, complement buildings and structures, and provide an attractive environment for the enjoyment of the public.

3.5.1.3 Waterfront District Master Plan

The WDMP serves as the zoning regulations for the project site. The WDMP is a form based zoning code that facilitates and regulates development of the waterfront area, including the proposed project site. The vision for development under the WDMP is to create a fully functional pedestrian and transit-oriented community where a multi-modal transit station, comprised of water ferry, train and bus transit, have been the center of the planning. The WDMP envisions the multi-modal transit adjacent to Refugio Creek at the Alternative 1 site. The WDMP acknowledges that the construction of the rail platform will cause Refugio Creek to be realigned and improved as it enters into San Pablo Bay. In addition, the WDMP plans for the John Muir Parkway extension, Transit Loop and Bayfront Boulevard.

The transit center is proposed to be located within the Historic Town Center (HTC) district. The HTC district is not only planned for the transit center, but also for mixed use neighborhood and residential uses, and retail and commercial uses.

The WDMP was amended in 2008 by the Waterfront Now Initiative to include provision applicable to the undeveloped areas of the waterfront area, including the project site. The WDMP includes urban and architectural regulations, development standards and design guidelines.

3.5.1.4 Bay Area Conservation and Development Commission

One of the BCDC primary roles is to review proposed development or changes to the shoreline and the first 100 feet inland from the bay, for their aesthetic and visual impact as outlined under the Bay Plan. The BCDC maintains public access design guidelines for the San Francisco Bay called "Shoreline Spaces," which provide direction for the design of gathering and seating areas, site furnishings, and signage along bay; shoreline projects are examined on a case-by-case basis.

Policy 4 of the BCDC's San Francisco Bay Plan, Findings and Policies – Transportation states: "Transportation projects on the bay shoreline and bridges over the bay or certain waterways should include pedestrian and bicycle paths that will either be a part of the Bay Trail or connect the Bay Trail with other regional and community trails. Transportation projects should be designed to maintain and enhance visual and physical access to the bay and along the bay shoreline."

3.5.2 Existing Conditions

The proposed project site is located near the southern shore of San Pablo Bay, in the City of Hercules. San Pablo Bay is a part of San Francisco Bay, and each is a major scenic resource, with broad vistas of water, islands, urban skylines, bridges, and mountains available from many parts of the Bay Area. The shoreline of the bay is characterized by a mix of open land and

commercial, maritime, industrial, residential, and recreational land uses. Hills and mountains surround the bay, creating both scenic backdrops to views from the lowlands or water and extensive viewing locations of the bay and surroundings from higher elevations. The project site served as part of the Hercules Powder Works in the early 1900s, at which time buildings and munitions bunkers were located. However, all the structures associated with this facility have since been removed from the project site.

The existing visual setting of the proposed project site includes views of a broad, low-lying floodplain adjacent to the undeveloped shoreline on San Pablo Bay to the north and east of the site. Views also include Hercules Point; approximately 4,000 linear feet of shoreline to the northeast, along the UPRR right of way; and an upland area east and west of Refugio Creek, extending from the railroad track south to Bayfront Boulevard (Figures 3.5-1, 3.5-2, 3.5-3a and 3.5-3b). The UPRR tracks and easement cross through the proposed project site in a northwesterly direction. Railroad signals are situated above the trestle bridge across Refugio Creek.

Hercules Point extends out approximately 1,200 feet into San Pablo Bay from the shoreline along the north side of the UPRR tracks. The point itself is scattered with rubble and other debris from the former Hercules Powder Company factory. A chain-link fence surrounds the edge of the point, and the partially sunken remains of the historic wooden wharf extend northwest from the end of the point. The visual quality of the point itself would be considered low, due to the litter and other debris associated with the demolition of the former factory. Views from the point, however, include striking panoramas of the bay shore. These views include those of skyline, hills and development of eastern Marin County. The Hercules General Plan has designated the point to become a public park and open space.

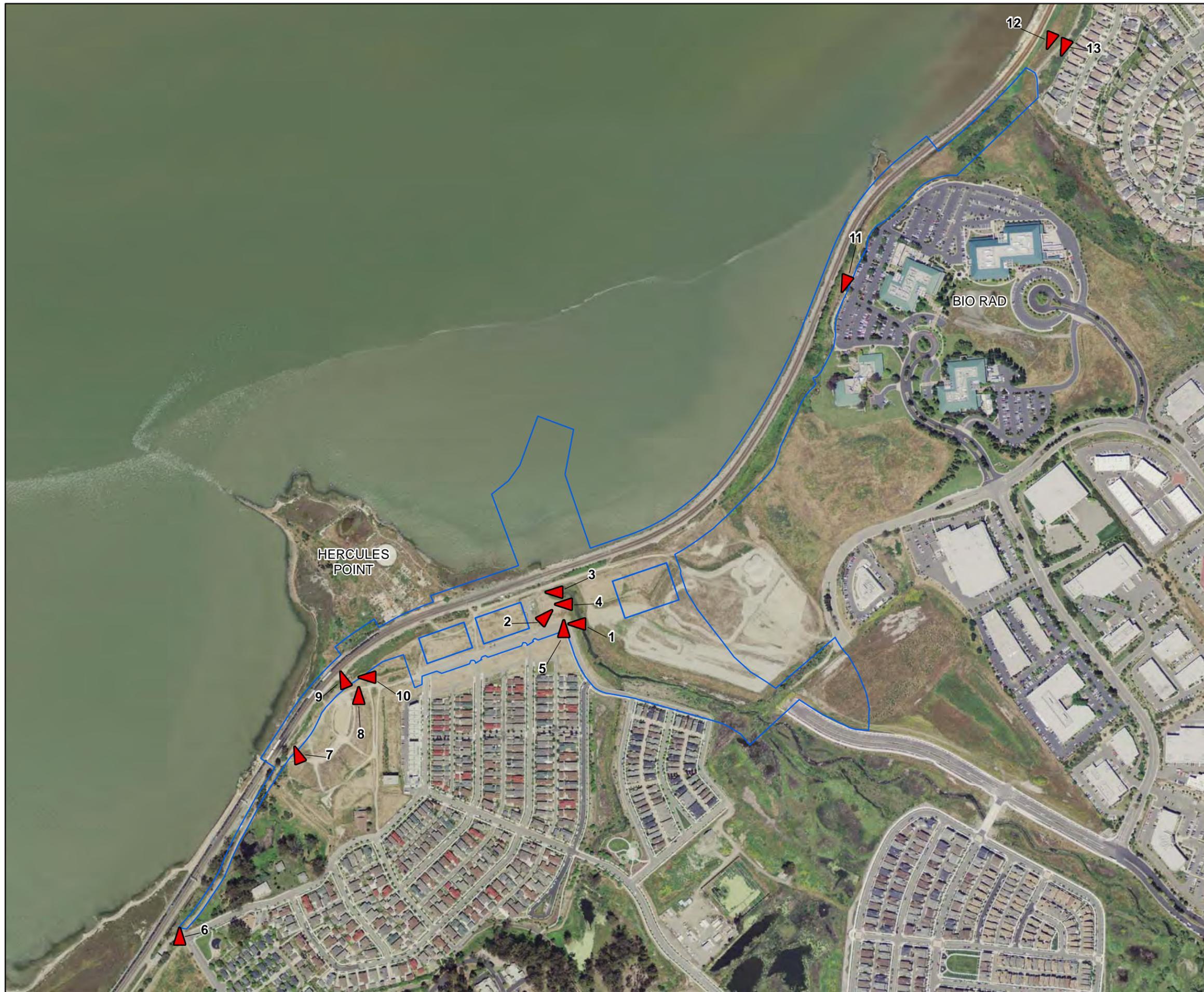
Lands east of Hercules Point primarily consist of low lying shoreline parallel to the UPRR tracks. An existing segment of the Bay Trail is located east of the Bio-Rad property and is part of the Victoria by the Bay subdivision. Residents of this subdivision and users of the Bay Trail have similar views of the bay shore and distant skyline of Marin County as those visible from other areas of the project.

The mouth of Refugio Creek is situated immediately east of Hercules Point. The creek flows through a narrow, steep-sided channel and intersects with the bay through a culvert beneath a wooden trestle UPRR bridge. The deep, narrow stream channel and bank vegetation screen views of the creek itself and it is not readily visible from most locations on the project site or in nearby areas.

Existing sources of light and glare on or near the project site include vehicles traveling on Bayfront Boulevard, train headlights along the UPRR track, and street and exterior lighting from nearby residential areas.

The land uses on parcels located to the south and southwest of the proposed project site are generally characterized as other undeveloped land, or residential and neighborhood commercial areas. Lands to the east and northeast of the project site include the undeveloped land

designated for the Bayfront Development for mixed-use development, which are about 300 feet south of the residential and neighborhood commercial uses further to the south. The nearest residential development is the Bayfront Development, which is located about 300 feet south of the proposed project site. Further to the east and northeast of the proposed project site are the Bio-Rad Corporation, a corporate research and development facility, as well as the North Shore Business Park (office, research, and light industrial).



Legend

- Approximate Location and Direction of Photos
- Project Boundary

1 in = 500 ft (at tabloid layout)

0 62.5 125 250 Meters

0 250 500 1,000 Feet

N

Figure 3.5-1: Existing Conditions; Site Photo Points and Directions

City of Hercules
 Hercules Intermodal Transit Facility
 Contra Costa County, California

Data Sources: Map information was compiled from the best available sources. No Warranty is made for its accuracy or completeness. Topographic Base Map, Aerial photography from ESRI ArcGIS Online; Hydrography from National Hydrography Dataset; NWI Data from U.S. Fish and Wildlife Service and soils data from USDA NRCS Soil Survey. Data is State Plane Feet, NAD83 Zone 3



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Photo point	Photo number	View Direction	Photo point location	Approximate View	Notes
1	IMG_0018	west	Bayfront Blvd.	proposed HITC site	
2	IMG_0019	northeast	near proposed transit loop	proposed transit loop and future parking garage	
3	IMG_0020	west	near proposed transit loop	proposed HITC site	without train
4	IMG_0021	west	near proposed transit loop	proposed HITC site	with train
5	IMG_0023	north	Bayfront Blvd.	existing UPRR bridge	
6	IMG_0024	north	Railroad Ave.	existing trail near Railroad Ave	
7	IMG_0025	west of north	south side of bowl	Hercules point and area near the western extent of the proposed track realignment	
8	IMG_0026	north	north side of bowl	proposed HITC location	
9	IMG_0027	west of north	north side of bowl	Hercules Point open space	
10	IMG_0028	west	north side of bowl	RR track and proposed trail location	
11	IMG_0030	west of south		proposed HITC location	
12	IMG_0031	west of south	Bay trail near Victoria by the Bay subdivision	UPRR tracks and proposed HITC location	
13	IMG_0032	west of south	Bay trail near Victoria by the Bay subdivision	UPRR tracks and proposed HITC location	

**Figure 3.5-2 Existing Conditions
Photo Points Key**

City of Hercules
Hercules Intermodal Transit Facility
Contra Costa County, California

Data Sources: Map information was compiled from the best available sources. No Warranty is made for its accuracy or completeness. Topographic Base Map, Aerial photography from ESRI ArcGIS Online; Hydrography from National Hydrography Dataset; NWI Data from U.S. Fish and Wildlife Service and soil data from USDA NRCS Soil Survey. Data is State Plane Feet, NAD83 Zone 3.



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Figure 3.5-3a: Existing Conditions Photo Points
 City of Hercules
 Hercules Intermodal Transit Facility
 Contra Costa County, California

Data Sources: Map information was compiled from the best available sources. No Warranty is made for its accuracy or completeness. Topographic Base Map, Aerial photography from ESRI ArcGIS Online; Hydrography from National Hydrography Dataset; NWI Data from U.S. Fish and Wildlife Service and soils data from USDA NRCS Soil Survey. Data is State Plane Feet, NAD83 Zone 3



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**Figure 3.5-3b: Existing Conditions
Photo Points (cont.)**
City of Hercules
Hercules Intermodal Transit Facility
Contra Costa County, California

Data Sources: Map information was compiled from the best available sources. No Warranty is made for its accuracy or completeness. Topographic Base Map, Aerial photography from ESRI ArcGIS Online; Hydrography from National Hydrography Dataset; NWI Data from U.S. Fish and Wildlife Service and soils data from USDA NRCS Soil Survey. Data is State Plane Feet, NAD83 Zone 3



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3.6 Parklands and Recreational Facilities

This section provides the regulatory framework for parklands and recreational facilities on a federal, state, regional, and local level. It also presents a description of the existing conditions of the project area as they relate to parks and recreation.

3.6.1 Regulatory Framework

3.6.1.1 Federal

United States Department of Transportation Act of 1966 - Section 4(f)

Section 4(f) of the U.S. Department of Transportation (U.S. DOT) Act of 1966 stipulates that U.S. DOT agencies, including the FTA, cannot approve the use of land from any publicly owned parks, recreation areas, wildlife or waterfowl refuge, or public and private historic sites listed or eligible for the National Register of Historic Places unless the following conditions apply:

- ◆ There is no feasible and prudent alternative to the use, and
- ◆ The action includes all possible planning to minimize harm to the property resulting from use.
- ◆ The Administration determines that the use of the property, including any measure(s) to minimize harm will have a *de minimus* impact on the property.

Section 4(f) requires that the U.S. DOT agency either (1) determine that the impacts to Section 4(f) properties are *de minimis*, or (2) undertake a 4(f) evaluation to identify a feasible and prudent alternative that either avoids Section 4(f) properties or select the alternative that causes the least overall harm. A *de minimis* impact is one that will not adversely affect the activities, features, or attributes of the property. Where there is no feasible and prudent avoidance alternative available, the lead DOT agency can approve a project that causes the least overall harm to the Section 4(f) property. Factors considered to make the determination of least overall harm are detailed in 23 CFR 774.3 (c) and includes the ability to mitigate adverse impacts to Section 4(f) property; and the relative significance of each Section 4(f) property.

Use of a Section 4(f) property occurs: (1) when land is permanently incorporated into a transportation facility; or (2) when there is a temporary occupancy of land that is adverse in terms of the statute's preservation purpose; or (3) when there is a constructive use (a project's proximity impacts are so severe that the protected activities, features, or attributes that qualify the resource for protection under Section 4(f) are substantially impaired).

'Officials having jurisdiction' are the officials of the agency owning or administering the land. If the authority has been delegated or relinquished to another agency, that agency must be contacted to determine the major purpose(s) of the land. The final decision on applicability of Section 4(f) to a particular property of type of land is made by FTA after consultation with the officials having jurisdiction over the Section 4(f) property.

United States Department of Interior Section 6(f) Lands

The Department of Interior Land and Water Conservation Fund Act (LWCFA) of 1965 established the land and water conservation fund, a matching assistance program that provides grants which pay half the acquisition and development cost of outdoor recreation sites and facilities. Section 6(f) of the act requires that all lands acquired or developed with LWCFA assistance be maintained in public outdoor recreation use. If the selected alternative directly or indirectly affects LWCFA funded parklands, consultation and approval must be obtained from the Department of Interior's National Park Service.

3.6.1.2 Regional and Local

San Francisco Bay Plan

BCDC is the federally-designated State coastal management agency for the San Francisco Bay segment of the California coastal zone. This designation empowers the BCDC to use the authority of the federal Coastal Zone Management Act to ensure that federal projects and activities are consistent with the policies of the Bay Plan and State law. BCDC has the authority to issue or deny permit applications for placing fill, extracting minerals, or changing the use of any land, water, or structure within the San Francisco Bay and associated shoreland areas. The San Francisco Bay Plan, adopted in 1968 by BCDC and last amended in 2008, includes policies to guide future uses of the Bay and shoreline and includes a set of maps which show where the policies should apply to the present Bay and its shoreline areas.

East Bay Regional Park District General Plan 1997

The East Bay Regional Park District (EBRPD) Master Plan 1997 defines the vision and the mission of the EBRPD and sets priorities for the future. It explains the EBRPD's multi-faceted responsibilities and provides policies and guidelines for achieving the highest standards of service in resource conservation, management, interpretation, public access, and recreation. The Master Plan 1997 is designed to maintain a careful balance between the need to protect and conserve resources and the recreational use of parklands for all to enjoy now and in the future. The Master Plan was prepared with the active participation of the EBRPD's citizen-based Park Advisory Committee and with extensive review and comment from the community. The Master Plan is revised and updated periodically to reflect new circumstances to which the EBRPD must respond.

City of Hercules General Plan Land Use Element

The Land Use Element of the General Plan identifies parklands, recreational facilities, and open spaces. The Land Use Element identifies Hercules Point (10.9 acres) as public open space.

Objective 1

Achieve a level of population and employment which preserves and enhances the desired character of the community.

Policy IA

Encourage and only allow development that is consistent with the Land Use Diagram, Land Use Categories; and objectives, policies and programs of the Land Use Element.

Program IA.1

Procedures to evaluate development applications for consistency with the Land Use Diagram, Land Use Categories; and objectives, policies and programs of the Land Use Element shall be incorporated into the application review procedures of the Zoning Ordinance. Applications shall also be evaluated in relation to the capacity of infrastructure and schools to serve the proposed development

City of Hercules General Plan Open Space/Conservation Element

The Open Space/Conservation Element of the General Plan includes objectives, policies, and programs related to parklands and recreational resources. Objectives, policies, and programs applicable to the project are listed below.

Objective 1

Provide adequate recreation, park, and open space resources as the community expands.

Policy Ia

Expand the community's park, trail, and open space system to meet the demands of future growth. The comprehensive park, trail and open space system shall provide linkages between developed and developing areas.

Program Ia.1. Public Open Spaces

The General Plan has been designed to preserve most of the existing high quality vegetation, wildlife habitat and landforms within the public open spaces and conservation areas. Public open spaces are classified into the following areas: riparian, chaparral, oak groves, salt marsh, and greenways.

Riparian Areas

The major riparian system is Refugio Creek from the easterly city limits to the Bay. Most of the creek east of I-80 will be maintained in a natural condition. The wildlife habitat will be enhanced by planting appropriate vegetation. Small ponds designed to reduce the velocity of water and possible erosion will also encourage wildlife in the riparian areas.

West of I-80, the existing low flow channel will be modified to the south in a multi-use open space corridor. The drainage facility will be designed and landscaped so as to have a natural appearance and enhance wildlife habitat. Some of the draws have springs which can be developed with watering holes and planting to support small animals.

Policy 1c

The City shall ensure that new development funds its share of costs associated with the provision of park facilities by attaching project-specific mitigation as conditions of approval.

- ◆ Standards: The standards for the provision of parks and open space in Hercules are:
 - ▲ A minimum of 1.75 acres of neighborhood parks shall be provided for each 1,000 residents.
 - ▲ A minimum of 3.25 acres of community park space shall be provided for each 1,000 residents.

Objective 5

Preserve salt marsh zones along San Pablo Bay.

Policy 5a

The city shall review development proposals for consistency with minimizing impacts to salt marsh zones. Buildings shall be located on existing developed or graded areas, where practicable.

Policy 5a.1

The City shall work with CDFG, BCDC, EBRPD, and the USACE to determine appropriate buffer zones along the Bay to protect tidal habitat when designing a Bay access trail linkage between Pinole and Rodeo. Public access and pedestrian pathways shall be limited within the buffer zone, and when possible, located along the edges of the buffer zone. Bicycles shall be encouraged to stay on bike paths through the use of signage and fencing.

Waterfront District Master Plan Initiative – Form-based Code

The Hercules City Council adopted the WDMP Initiative in 2008, which amended the Land Use, Open Space/Conservation, Growth Management, Hazardous Waste elements, and the Zoning Ordinance. The Initiative also amends the WDMP by adding a Section 4 to establish a form based code to regulate and provide detailed development and design standards solely for the undeveloped portions of the Historic Town Center, Transit Village, and the Hercules Point sub-districts.

The Civic Space Standards of the form-based code describes the design framework for public spaces in the undeveloped portions of the Historic Town Center, Transit Village, and the Hercules Point sub-districts, which includes the Bayfront/Creekside Parks, the Bay Trail, and the Creekside Trail.

3.6.2 Existing Conditions

3.6.2.1 Parklands and Recreational Facilities

City of Hercules

The City Recreation and Community Services Department (Department) operates and maintains eight parks and provides a wide variety of recreational, educational, and social activities for all citizens (Figure 3.6-1). Summary descriptions of the individual City-operated park facilities by the City are provided below:

- ◆ Refugio Valley Park is 55 acres in size and contains seven picnic tables, two BBQ pits, four tennis courts, 37 parking spaces, a jogging trail, a lake, restrooms, a par course, multi-use field, a drinking fountain, and a children's tot lot.
- ◆ Ohlone Park includes eight picnic tables, 12 BBQ pits, an open field, a nature trail, restrooms, and amphitheater community garden.
- ◆ Woodfield Park includes a children's tot lot, two basketball courts, one softball field, one multi-use field, two tennis courts, and restrooms.
- ◆ Foxboro Park and Tennis Courts includes a recreation building, children's tot lot, two tennis courts, one basketball court, four picnic tables, four BBQ pits, one multi-use field, a jogging trail, restrooms, drinking and fountain,
- ◆ Railroad Park includes four BBQ pits, four picnic tables, and a play area.
- ◆ Hanna Ranch Park includes a softball field, restrooms, and a multi-use field with bleachers, a soccer field, a jogging trail, and parking.
- ◆ Frog Pad Park includes a playground (ages 5-12), a children's tot lot, four picnic tables, and a drinking fountain.
- ◆ Bayside Park includes a children's tot lot, drinking fountain, and approximately a half-acre of grass playing field.

The Hercules Point area is a privately owned parcel on the northern boundary of the proposed project site that is planned as a private to public land transfer to eventually become open space and a designated public park on 10.96 acres. The City has been negotiating with the land owner regarding the transfer of land. No transfer of land between private and public will occur prior to the completion of the NEPA process, per 23 CFR 771.113. The site is the former location of the Hercules Powder explosives plant facilities that has been cleared of its structures. The site is presently vacant and access is restricted. To date, no specific design plan for its reuse has been adopted.

East Bay Regional Park District

The EBRPD manages over 95,000 acres within Alameda and Contra Costa Counties, including 65 regional parks, recreational areas, wilderness, shorelines, preserves, and land bank areas. The EBRPD properties within the vicinity of the Hercules ITC site include San Pablo Bay

Regional Park, Lone Tree Park, and Pinole Point Regional Shoreline. The Pinole Point Regional Shoreline is located just south of the Hercules ITC project site.

The Bay Trail

An undeveloped segment of the Bay Trail passes through the project site. The Bay Trail was initiated in 1987 by Senate Bill 100, which directed the Association of Bay Area Governments (ABAG) to develop a plan for this "ring around the Bay," including a specific alignment for the Bay Trail. The Bay Trail Plan, adopted by ABAG in July 1989, includes: a proposed alignment; a set of policies to guide the future selection, design and implementation of routes; and strategies for implementation and financing. The Bay Trail is now a collaborative project by Bay Area cities, park agencies [California Department of Parks and Recreation (CDPR) and EBRPD], regional agencies (ABAG and BCDC), and transportation agencies (Caltrans and MTC) to create a multi-use trail around the Bay. The Bay Trail Plan enjoys widespread support in the Bay Area, The City and the majority of the jurisdictions along the Bay Trail alignment has passed resolutions in support of the Bay Trail and has incorporated it into their respective general plans. The WDMP's form based code (2008) identifies the Bay Trail as an important recreation feature and connection to regional paths and biking trails and specifies that its development adhere to ABAG's standards. On May 30, 2007, EBRPD entered a Settlement Agreement with Bio-Rad Laboratories, Inc., pursuant to which Bio-Rad donated an easement to EBRPD for the purpose of facilitating alignment of the portion of the Bay Trail - Hercules Segment along and upon property within the City owned by Bio-Rad, and adjacent to the proposed project site.

In order to properly integrate the design and construction of the Hercules ITC and the Bay Trail - Hercules Segment, the City of Hercules is willing to undertake the design and construction of the Bay Trail - Bio-Rad Segment. The EBRPD would allow the City to undertake the design and construction of the Bay Trail - Bio-Rad Segment, subject to the terms of their mutual agreement. The City's Redevelopment Agency executed an agreement with EBRPD in November, 2010. With the dissolution of the redevelopment agencies at end of last year, the City is working with EBRPD to update the agreement.

In the vicinity of the northeast portion of Track Option B, a 2,065-ft. length of existing segment of the Bay Trail is located in the Victoria by the Bay subdivision. The meandering trail is located between the UPRR right-of-way and the edge of the subdivision. When complete, the Bay Trail will be a continuous 400-mile recreational corridor that will encircle the entire Bay Area, connecting communities to each other and to the Bay. It will link the shorelines of all nine counties in the Bay Area and 47 of its cities. The Bay Trail represents an important element in linking the noncontiguous parts of the Eastshore Park Project to each other and to adjacent municipal recreational facilities. To date, 240 miles of the Bay Trail, or more than half its ultimate length, have been developed.



Figure 3.6-1: City of Hercules Parks

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3.7 Air Quality

This section presents existing air quality conditions in the project area (including the project site, applicable air district jurisdiction, and air basin) and provides a description of the regulatory framework for air quality management on a federal, state, regional, and local level.

The analysis of air quality impacts is based on air quality regulations administered by the USEPA, the California Air Resources Board (CARB), and the Bay Area Air Quality Management District (BAAQMD) with each agency responsible for different aspects of the proposed project's activities. The roles of these agencies are discussed in detail in Section 3.7.1, Regulatory Framework. Other sources used in the assessment include the BAAQMD CEQA Guidelines [for] Assessing the Air Quality Impacts of Projects and Plans (BAAQMD 1999); and the Bay Area 2005 Ozone Strategy (BAAQMD 2006).

In response to the Notice of Preparation/Notice of Intent, CARB submitted a comment regarding the implementation of all feasible measures to reduce emissions of oxides of nitrogen (NO_x), reactive organic gases (ROG), and carbon monoxide (CO) to the maximum extent possible.

3.7.1 Regulatory Framework

3.7.1.1 Federal, State, and Local Air Quality Agencies

Air quality within the San Francisco Bay Area Air Basin (SFBAAB) is addressed through the efforts of various federal, state, regional, and local government agencies. These agencies work jointly as well as individually to improve air quality through legislation, regulations, planning, policymaking, education, and a variety of programs. The agencies primarily responsible for improving the air quality within the basin are discussed below along with their individual responsibilities.

U.S. Environmental Protection Agency

The USEPA is responsible for enforcing the Federal Clean Air Act (CAA) and the National Ambient Air Quality Standards (NAAQS). The NAAQS identify levels of air quality for seven criteria pollutants that are considered the maximum levels of ambient (background) air pollutants considered safe, with an adequate margin of safety, to protect public health and welfare. The seven criteria pollutants are O₃, CO, NO₂, SO₂, PM₁₀, PM_{2.5}, and lead. Particulate matter is the general term used for a mixture of solid particles and liquid droplets found in the air. For air quality purposes, these particles are classified by size: fine particulates (i.e., PM_{2.5}) have a diameter less than or equal to 2.5 micrometers, and respirable or coarse particulates (i.e., PM₁₀) have a diameter less than or equal to 10 micrometers. The federal ambient air quality standards and the relevant health effects of the criteria pollutants are summarized in Table 3.7-1.

The basin is currently classified by the USEPA as a nonattainment/marginal area for the 8-hour standard for O₃ (the 1-hour standard was revoked as of June 15, 2005). The basin was also recently designated nonattainment for the fine particulate matter (PM_{2.5}) standard. Additionally,

it has been designated as an attainment/maintenance area for the 1-hour and 8-hour standards for CO, and has been designated attainment/unclassifiable for the annual standard for NO₂ and the 24-hour PM₁₀ standard. The basin has been designated as an attainment area for the quarterly and the 3-month rolling lead standards and the 24-hour and annual SO₂ standards. In response to its enforcement responsibilities, the USEPA requires each state to prepare and submit a State Implementation Plan (SIP) describing how the state will achieve the federal standards by specified dates, depending on the severity of the air quality within the state or air basin. Air quality attainment plans are discussed in further detail below.

The status of the SFBAAB with respect to attainment with the NAAQS is summarized in Table 3.7-1.

Table 3.7-1 National Ambient Air Quality Standards and Status - San Francisco Bay Area Air Basin

Pollutant	Averaging Time	Designation/ Classification
Ozone (O3)	8 Hour	Nonattainment/Marginal
Carbon Monoxide (CO)	1 Hour, 8 Hour	Attainment/Maintenance
Nitrogen Dioxide (NO2)	Annual Arithmetic Mean	Attainment/Unclassifiable
Sulfur Dioxide (SO2)	24 Hour, Annual Arithmetic Mean	Attainment
Respirable Particulate Matter (PM10)	24 Hour	Attainment/Unclassifiable
Fine Particulate Matter (PM2.5)	24 Hour, Annual Arithmetic Mean	Nonattainment
Lead (Pb)	Calendar Quarter, 3-Month Rolling	Attainment

Source: Environmental Protection Agency 2010b

Hazardous Air Pollutants

Regulation of hazardous air pollutants (HAPs) under federal regulations is achieved through federal and state controls on individual sources. Federal law defines HAPs as non-criteria air pollutants with short-term (acute) and/or long-term (chronic or carcinogenic) adverse human health effects. The 1990 federal CAA Amendments offer a comprehensive plan for achieving significant reductions in both mobile and stationary source emissions of HAPs. Under the 1990 CAA Amendments, a total of 189 chemicals or chemical families were designated HAPs because of their adverse human health effects. Title III of the 1990 federal CAA Amendments amended Section 112 of the CAA to replace the former program with an entirely new technology-based program. Under Title III, the USEPA must establish maximum achievable control technology emission standards for all new and existing “major” stationary sources through promulgation of National Emission Standards for Hazardous Air Pollutants (NESHAP). Major stationary sources of HAPs are required to obtain an operating permit from the BAAQMD pursuant to Title V of the 1990 CAA Amendments.

California Air Resources Board

CARB, a branch of the California Environmental Protection Agency (Cal/EPA), oversees air quality planning and control throughout California. It is primarily responsible for ensuring implementation of the 1988 California Clean Air Act (CCAA) for responding to the federal

CAA requirements, and for regulating emissions from motor vehicles and consumer products within the state. CARB has established emission standards for vehicles sold in California and for various types of equipment available commercially. It also sets fuel specifications to further reduce vehicular emissions.

Like the USEPA, CARB has established ambient air quality standards for the state (i.e., CAAQS). These standards apply to the same seven criteria pollutants as the federal CAA and also address sulfates (SO₄), visibility-reducing particles, hydrogen sulfide (H₂S) and vinyl chloride (CH₂=CH-Cl). The CCAA standards are more stringent than the federal standards and, in the case of PM₁₀ and SO₂, far more stringent. The CCAA requires air pollution control districts to achieve the state standards by the earliest practicable date.

Based on monitored pollutant levels, the CCAA divides O₃ nonattainment areas into four categories—moderate, serious, severe, and extreme—to which progressively more stringent planning and emission control requirements apply.

The basin is a nonattainment area for the California 1-hour and 8-hour ozone standard. In regard to particulate matter, the basin is designated as nonattainment for the California 24-hour and annual PM₁₀ standards, as well as the California annual PM_{2.5} standard. The basin is designated as attainment or unclassifiable for all other CAAQS. The ozone precursors, ROG and NO_x, in addition to PM₁₀ and PM_{2.5}, are the pollutants of concern for projects located in the basin. The status of the basin with respect to attainment with the CAAQS is summarized in Table 3.7-2, California Ambient Air Quality Standards and Status – San Francisco Bay Area Air Basin.

Table 3.7-2 California Ambient Air Quality Standards and Status San Francisco Bay Area Air Basin

Pollutant	Averaging Time	Designation/ Classification
Ozone (O ₃)	1 Hour, 8 Hour	Nonattainment ¹
Carbon Monoxide (CO)	1 Hour, 8 Hour	Attainment
Nitrogen Dioxide (NO ₂)	1 Hour	Attainment
Sulfur Dioxide (SO ₂)	1 Hour, 24 Hour	Attainment
Respirable Particulate Matter (PM ₁₀)	24 Hour, Annual Arithmetic Mean	Nonattainment
Fine Particulate Matter (PM _{2.5})	Annual Arithmetic Mean	Nonattainment
Lead (Pb) ²	30 Day Average	Attainment
Sulfates (SO ₄)	24 Hour	Attainment
Hydrogen Sulfide (H ₂ S)	1 Hour	Unclassified
Vinyl Chloride ²	24 Hour	Unclassified
Visibility-Reducing Particles	8 Hour (10 AM–6 PM)	Unclassified

Source: California Air Resources Board 2010b.

¹ CARB has not issued area classifications based on the new state 8-hour standard. The previous classification for the 1-hour ozone standard was Serious.

² CARB has identified lead and vinyl chloride as “toxic air contaminants” with no threshold level of exposure for adverse health effects determined.

Toxic Air Contaminants

California law defines toxic air contaminants (TAC) as air pollutants having carcinogenic or other health effects. Assembly Bill (AB) 1807 (the Tanner Bill, passed in 1983) established the State Air Toxics Program and the methods for designating certain chemicals as TACs. A total of 245 substances have been designated TACs under California law; they include the federal HAPs adopted as TACs in accordance with AB 2728. The Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588) seeks to identify and evaluate risk from air toxics sources, although AB 2588 does not directly regulate air toxics emissions. Under AB 2588, sources emitting more than 10 tons per year of any criteria air pollutant must estimate and report their toxic air emissions to the local air districts. Local air districts then rank facilities on the basis of emissions, and high priority facilities are required to submit a health risk assessment and communicate the results to the affected public. Depending on risk levels, emitting facilities are required to implement varying levels of risk reduction measures. The BAAQMD is responsible for implementing AB 2588 in the basin.

The BAAQMD is currently working to control the effects of TACs from local hot spots and ambient background concentrations. The control strategy involves reviewing new sources to ensure compliance with required emission controls and limits, maintaining an inventory of existing sources to identify major TAC emissions and developing measures to reduce TAC emissions. The BAAQMD publishes the results of the various control programs in an annual report, which provides information on the current TAC inventory, AB 2588 risk assessments, TAC monitoring programs, and TAC control measures and plans.

One of the TACs being controlled by the BAAQMD is particulate matter (PM) from diesel-fueled engines, also known as diesel exhaust particulate. In 1998, CARB identified diesel exhaust particulate as a TAC. Compared to other TACs, diesel exhaust particulate emissions are estimated to be responsible for about 70 percent of the total ambient air toxics risk in the basin. On a statewide basis, the average potential cancer risk associated with these emissions is over 500 potential cancer cases per million exposed people. In addition to these general risks, diesel exhaust particulate can also present elevated localized or near-source exposures.

Bay Area Air Quality Management District

Management of air quality in the basin is the responsibility of the BAAQMD. The BAAQMD is responsible for bringing and/or maintaining air quality in the basin within federal and state air quality standards. Specifically, the BAAQMD has responsibility for monitoring ambient air pollutant levels throughout the basin and developing and implementing attainment strategies to ensure that future emissions will be within federal and state standards.

3.7.1.2 Clean Air Plans

As discussed previously, the CAA and CCAA require preparation of plans to reduce air pollution to healthful levels. The BAAQMD has responded to this requirement by preparing a series of Clean Air Plans (CAP), the most recent and rigorous of which was approved in December 2000. The 2000 CAP continues the air pollution reduction strategy established by

the 1991 CAP and represents the third triennial update to the 1991 CAP, following previous updates in 1994 and 1997. The 2000 CAP is designed to address attainment of the state standard for O₃.

The 1997 CAP contained stationary and mobile source control measures, which included developing rules to reduce vehicle trips to and from major residential developments, shopping centers and other indirect sources; encouraging cities and counties to plan for high-density development; and clustering development with mixed uses in the vicinity of mass transit stations. The 2000 CAP includes changes in the organization and scheduling of some existing control measures, some new stationary source control measures, revisions to previous stationary source measures and deletion of some control measures deemed no longer feasible by BAAQMD staff. The transportation control measures (TCM) in the 2000 CAP are unchanged from the 1997 CAP. The 2000 CAP continues to discourage urban sprawl while strongly endorsing high-density mixed-use developments near transit centers that reduce the need for commuting by personal vehicles.

Currently, the BAAQMD is developing the 2009 CAP that will update the 2005 Ozone Strategy (discussed below) and consider the impacts of ozone control measures on particulate matter, air toxics, and greenhouse gases in a single, integrated plan. The 2009 CAP is also expected to review progress in improving air quality in recent years and establish emission control measures to be implemented in the 2009-2012 timeframe.

2001 Ozone Attainment Plan

The BAAQMD developed the 2001 Ozone Attainment Plan as a guideline to achieve the federal 1-hour ozone standard. The 2001 Attainment Plan was approved by CARB in 2001 and by the USEPA in 2003. In April 2004, the USEPA determined the SFBAAB had attained the federal 1-hour ozone standard. Due to the attainment status of the basin, the 1-hour ozone requirements set forth in the 2001 Ozone Attainment Plan were no longer required. A year later, in 2005, the federal 1-hour ozone standard was revoked by the USEPA for a new and more health-protective 8-hour standard. The SFBAAB was designated as marginal nonattainment for the federal 8-hour ozone standard. Although designated as nonattainment, areas designated as marginal nonattainment or less were not required to submit new attainment plans. Nonetheless, the control measures and strategies described in the 2001 Ozone Attainment Plan for the 1-hour standard will also help achieve attainment with the 8-hour standard.

2005 Ozone Strategy

The 2005 Ozone Strategy is a comprehensive document mapping how the SFBAAB will achieve attainment of the state 1-hour ozone standard as expeditiously as possible and how the basin will reduce transport of ozone and ozone precursors to neighboring air basins. The 2005 Ozone Strategy was prepared by the BAAQMD in cooperation with the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG). The document outlines how the basin will meet the CCAA planning requirements and transport

mitigation requirements through implementation of control measures and strategies. The 2005 Ozone Strategy describes its plans to implement stationary source control measures through District regulations; mobile source control measures through incentive programs; and transportation control measures through transportation programs in cooperation with MTC, transit agencies, and local governments.

BAAQMD Rules and Regulations

The BAAQMD is responsible for limiting the amount of emissions that can be generated throughout the basin by stationary sources. Specific rules and regulations have been adopted that limit emissions that can be generated by various uses and/or activities and identify specific pollution reduction measures that must be implemented in association with various uses and activities. These rules regulate not only the emissions of the state and federal criteria pollutants, but also the emissions of toxic air contaminants. The rules are also subject to ongoing refinement by the BAAQMD.

Some emission sources subject to these rules are regulated through the BAAQMD's permitting process. Through this permitting process, the BAAQMD also monitors the amount of stationary emissions being generated and uses this information in developing the CAP.

BAAQMD CEQA Guidelines

In April 1996, the BAAQMD prepared its BAAQMD CEQA Guidelines as a guidance document to provide lead government agencies, consultants, and project proponents with uniform procedures for assessing air quality impacts and preparing the air quality sections of environmental documents for projects subject to CEQA. The BAAQMD CEQA Guidelines were last revised in December 1999, although the document is in the process of being updated. The most recent draft of the revised BAAQMD CEQA Guidelines was issued in December 2009, with public hearings scheduled for April 2010. The BAAQMD CEQA Guidelines document describes the criteria that the BAAQMD uses when reviewing and commenting on the adequacy of environmental documents, such as this FEIS. The BAAQMD CEQA Guidelines recommend thresholds for use in determining whether projects would have significant adverse environmental impacts, identify methodologies for predicting project emissions and impacts, and identify measures that can be used to avoid or reduce air quality impacts. The BAAQMD CEQA Guidelines revisions are underway and are expected to be finalized later in 2010.

Association of Bay Area Governments

The ABAG is a council of governments for the counties of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Sonoma, and Solano. ABAG is a regional planning agency and serves as a forum for regional issues relating to transportation, the economy, community development, and the environment. ABAG also serves as the regional clearinghouse for projects requiring environmental documentation under federal and state law.

In this role, ABAG reviews proposed projects to analyze their impacts on ABAG's regional planning efforts.

Although ABAG is not an air quality management agency, it is responsible for several air quality planning issues. Specifically, as the designated Metropolitan Planning Organization (MPO) for the nine counties, it is responsible, pursuant to Section 176(c) of the 1990 Amendments to the federal CAA, for providing current population, employment, travel, and congestion projections for regional air quality planning efforts. ABAG is required to quantify and document the demographic and employment factors influencing expected transportation demand, including land use forecasts. ABAG is also responsible for preparing and approving the portions of the basin's CAP relating to demographic projections and integrated regional land use, housing and employment, as well as transportation programs, measures, and strategies.

Global Climate Change and Greenhouse Gas Regulations

Greenhouse Effect. The greenhouse effect is a natural process by which some of the radiant heat from the sun is captured in the lower atmosphere of the earth. The gases that help capture the heat are called greenhouse gases (GHG). Some GHGs occur naturally in the atmosphere, while others result from human activities. Naturally occurring GHGs include water vapor, carbon dioxide, methane, nitrous oxide, and ozone. Certain human activities add to the levels of most of these naturally occurring gases. While GHGs are not normally considered air pollutants, the effect of these gases have been identified as causing a warming of the earth's atmosphere and oceans above naturally occurring temperatures.

Greenhouse Gases. The following gases are considered to be the primary GHGs and, with the exception of water vapor, are regulated under the Kyoto Protocol (discussed in detail below):

- ◆ ***Water Vapor (H₂O(g))***. Although water vapor has not received as much scrutiny as the other GHGs, it is the primary contributor to the greenhouse effect. Water vapor and clouds contribute 66 to 85 percent of the greenhouse effect (water vapor alone contributes 36 to 66 percent) (Schmidt 2005). Natural processes such as evaporation from oceans and rivers and transpiration from plants contribute 90 percent and 10 percent of the water vapor in our atmosphere, respectively (USGS 2007). The primary human-related source of water vapor comes from fuel combustion in motor vehicles; however, this is not believed to contribute a significant amount (less than 1 percent) to atmospheric concentrations of water vapor (Energy Information Administration 2008). Therefore, the control and reduction of water vapor emissions is not within reach of human actions. The Intergovernmental Panel on Climate Change (IPCC) has not determined a Global Warming Potential (GWP), discussed below, for water vapor.
- ◆ ***Carbon Dioxide (CO₂)***. Carbon dioxide is generated primarily by fossil fuel combustion from stationary and mobile sources. Due to the emergence of industrial facilities and mobile sources over the past 250 years, the concentration of carbon dioxide in the atmosphere has increased 35 percent. Carbon dioxide is the most widely emitted GHG and is the reference gas (GWP of 1) for determining the GWPs of other GHGs. In 2004, 83.8 percent of California's GHG emissions were carbon dioxide (California Energy Commission 2006).

- ◆ **Methane (CH₄).** Methane is emitted from biogenic sources, incomplete combustion in forest fires, landfills, manure management, and leaks in natural gas pipelines. In the United States, the top three sources of methane are landfills, natural gas systems, and enteric fermentation (USEPA no date [a]). Methane is the primary component of natural gas, which is used for space and water heating, steam production, and power generation. The GWP of methane is 21.
- ◆ **Nitrous Oxide (NO₂).** Nitrous oxide is produced by both natural and human-related sources. Primary human-related sources include agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic acid production, and nitric acid production. The GWP of nitrous oxide is 310.
- ◆ **Hydrofluorocarbons (HFC).** HFCs typically are used as refrigerants in both stationary refrigeration and mobile air conditioning. The use of HFCs for cooling and foam blowing is growing particularly as the continued phaseout of chlorofluorocarbons (CFC) and hydrochlorofluorocarbons (HCFC) gains momentum. The GWP of HFCs range from 140 for HFC-152a to 6,300 for HFC-236fa.
- ◆ **Perfluorocarbons (PFC).** Perfluorocarbons are compounds consisting of carbon and fluorine. They are primarily created as a byproduct of aluminum production and semiconductor manufacturing. Perfluorocarbons are potent GHGs with a GWP several thousand times that of carbon dioxide, depending on the specific PFC. Another area of concern regarding PFCs is their long atmospheric lifetime (up to 50,000 years) (Energy Information Administration n.d.). The GWPs of PFCs range from 5,700 to 11,900.
- ◆ **Sulfur Hexafluoride (SF₆).** Sulfur hexafluoride is a colorless, odorless, nontoxic, nonflammable gas. It is most commonly used as an electrical insulator in high voltage equipment that transmits and distributes electricity. Sulfur hexafluoride is the most potent GHG that has been evaluated by the IPCC with a GWP of 23,900. However, its global warming contribution is not as high as the GWP would indicate due to its low mixing ratio, as compared to carbon dioxide (4 parts per trillion [ppt] of SF₆ in 1990 versus 365 parts per million).
- ◆ **Hydrochlorofluorocarbons (HCFC).** HCFCs are solvents, similar in use and chemical composition to CFCs. The main uses of HCFCs are for refrigerant products and air conditioning systems. As part of the Montreal Protocol, all developed countries that adhere to the protocol are subject to a consumption cap and gradual phaseout of HCFCs. The United States is scheduled to reduce its HCFC consumption to the allowed cap by 2030. The GWPs of HCFCs range from 93 for HCFC-123 to 2,000 for HCFC-142b (USEPA 1996).
- ◆ **1,1,1-trichloroethane.** 1,1,1-trichloroethane or methyl chloroform is a solvent and degreasing agent that was commonly used by manufacturers. In 1992, the USEPA issued Final Rule [ppm of CO₂] (USEPA no date [b]).

In addition to the primary GHGs discussed above, many other compounds have the potential to contribute to the greenhouse effect. Some of these substances previously were identified as stratospheric ozone depleters; therefore, their gradual phase-out currently is in effect. Some of the noteworthy compounds are discussed below:

- ◆ **57 FR 33754**, which scheduled the phaseout of methyl chloroform by 2002 (USEPA 2007b). This was later accelerated to a 1995 phaseout. The GWP of methyl chloroform is 110 times that of carbon dioxide (USEPA no date [c]).⁴
- ◆ **Chlorofluorocarbons (CFC)**. CFCs are used as refrigerants, cleaning solvents, and aerosol spray propellants. CFCs also were part of the USEPA's Final Rule 57 FR 33754 and were phased out in 1995. Currently, CFCs have been replaced by HFCs in cooling systems and a variety of alternatives for cleaning solvents. Nevertheless, CFCs remain suspended in the atmosphere, contributing to the greenhouse effect. CFCs are potent GHGs with GWPs ranging from 4,600 for CFC-11 to 14,000 for CFC-13 (USEPA 2006).
- ◆ **Ozone (O3)**. Ozone occurs naturally in the stratosphere⁵ where it is largely responsible for filtering harmful ultraviolet (UV) radiation. In the troposphere (i.e., the lowest portion of the Earth's atmosphere), ozone acts as a GHG by absorbing and re-radiating the infrared energy emitted by the Earth. As a result of the industrial revolution and rising emissions of oxides of nitrogen and volatile organic compounds, both of which act as ozone precursors, the concentrations of ozone in the troposphere have increased (Intergovernmental Panel on Climate Change no date). Due to the short life span of ozone in the troposphere, its concentration and contribution to global climate change is not well established. However, the greenhouse effect of tropospheric ozone is considered small, as the radiative forcing⁶ of ozone is 25 percent of that of CO₂ (Intergovernmental Panel on Climate Change 2007).

Scientists have established a GWP for each GHG based on its ability to absorb and re-radiate long-wave radiation. The GWP of a gas is determined using CO₂ as the reference gas with a GWP of 1. As an example, a gas with a GWP of 10 is 10 times more potent than CO₂ over a specified time period (typically 100 years) with respect to its ability to absorb and re-radiate long-wave radiation. The use of GWP allows GHG emissions to be reported using CO₂ as a baseline. The sum of each GHG multiplied by its associated GWP is referred to as carbon dioxide equivalents (CO₂e). This essentially means that 1 metric ton of a GHG with a GWP of 10 is equivalent to 10 metric tons of CO₂ over a specified time period.

The BAAQMD has prepared a GHG emissions inventory for the Bay Area using 2007 as the base year. The BAAQMD estimated that 102.6 million metric tons (MMT) of CO₂e GHGs were emitted from anthropogenic (human activity) sources in the Bay Area in 2007. Fossil fuel consumption in the transportation sector (on-road motor vehicles) accounted for approximately 41 percent. Stationary sources, including industrial and commercial sources, power plants, oil refineries, and landfills were responsible for approximately 49 percent. Residential fuel usage accounted for approximately 7 percent. Construction and mining equipment was estimated to account for approximately 3 percent of the total anthropogenic GHG emissions (BAAQMD 2008).

⁴ United States Environmental Protection Agency, "Protection of Stratospheric Ozone."

⁵ The stratosphere is defined as the layer of the Earth's atmosphere above the troposphere from approximately 10 to 12 miles up to 30 to 35 miles. The ozone layer is located in the stratosphere.

⁶ Radiative forcing, measured in Watts/m², is an externally imposed perturbation (e.g., stimulated by greenhouse gases) in the radiative energy budget of the Earth's climate system (i.e., energy and heat retained in the troposphere minus energy passed to the stratosphere).

Climate Change Effects in California. According to the 2006 California Climate Action Team (CAT) report (Cal/EPA 2006), the following climate change effects are predicted in California over the course of the next century:

- ◆ A diminishing Sierra snowpack declining by 70 percent to 90 percent, threatening the state's water supply.
- ◆ Increasing temperatures from 8 to 10.4 degrees Fahrenheit under the higher emission scenarios, leading to a 25 to 35 percent increase in the number of days ozone pollution levels are exceeded in most urban areas.
- ◆ Coastal erosion along the length of California and sea water intrusion into the Delta from a 4- to 33-inch rise in sea level. This would exacerbate flooding in already vulnerable regions.
- ◆ Increased vulnerability of forests due to pest infestation and increased temperatures.
- ◆ Increased challenges for the state's important agriculture industry from limited water supply, increasing temperatures, and saltwater intrusion into the Delta.
- ◆ Increased electricity demand, particularly in the hot summer months.

International and Federal Greenhouse Gas Regulations

Globally, the overarching treaty that was developed to respond to global climate change and reduce GHG emissions is known as the Kyoto Protocol. The Kyoto Protocol was negotiated in December 1997 and came into force on February 16, 2005. For the protocol to have entered into force, no less than 55 countries must have ratified the treaty and these minimum of 55 needed to have together accounted for at least 55 percent of the total carbon dioxide emissions for 1990 of industrialized countries, referred to as "Annex I countries." Participating nations are separated into Annex 1 (i.e., industrialized countries) and Non-Annex 1 (i.e., developing countries) countries, each with differing requirements for GHG reductions. The United States has not ratified the Protocol.

The federal government has recently begun to address global climate change. In *Massachusetts vs. EPA*, the Supreme Court held that USEPA has the statutory authority under Section 202 of the CAA to regulate GHGs from new motor vehicles. The Court did not hold that the USEPA was required to regulate GHG emissions; however, it indicated that the agency must decide whether GHGs from motor vehicles cause or contribute to air pollution that is reasonably anticipated to endanger public health or welfare. Upon the final decision, President Bush signed Executive Order 13432 on May 14, 2007, directing the USEPA, along with the Departments of Transportation, Energy, and Agriculture, to initiate a regulatory process that responds to the Supreme Court's decision. The order requires the USEPA to coordinate closely with other federal agencies and to consider the president's Twenty-in-Ten Plan in this process, which would establish a new alternative fuel standard that would require the use of 35 billion gallons of alternative and renewable fuels by 2017.

The Energy Independence and Security Act of 2007 sets a mandatory Renewable Fuel Standard (RFS) requiring fuel producers to use at least 36 billion gallons of biofuel in 2022 and sets a

national fuel economy standard of 35 miles per gallon by 2020. The Act also contains provisions for energy efficiency in lighting and appliances and for the implementation of green building technologies in federal buildings.

On May 19, 2009, President Obama announced increases in national fuel efficiency standards for all new cars and trucks sold in the United States. The announcement resulted in a Proposed Rulemaking by the USEPA and the National Highway Traffic Safety Administration on September 19, 2009. The proposed rules cover model years 2012 through 2016 and will require an average fuel economy of 35.5 miles per gallon in 2016, with a fuel economy gain averaging more than 5 percent per year. The resulting reduction in GHGs is estimated at 950 MMT. This surpasses the average fuel economy standard implemented in 2007 with the Energy Independence and Security Act.

Beginning in 2010, large emitters of GHGs are required to report annual emissions to the USEPA, under new rules finalized in September 2009. The mandatory reporting requirements will cover approximately 85 percent of the nation's GHG emissions and will apply to roughly 10,000 facilities. The first report will be required in 2011 and will cover the 2010 calendar year. Although the mandatory reporting requirements will not directly result in GHG reductions, it will provide the USEPA with a better understanding of GHGs sources and will guide development of policies and programs to reduce emission in the future.

Most recently, on December 7, 2009, the USEPA issued two distinct findings regarding GHGs under Section 202(a) of the CAA. The USEPA Administrator found, first, that GHGs threaten public health and welfare or current and future generations, and second, that GHG emissions from new motor vehicles contribute to the GHG pollution which threatens public health and welfare. Essentially, the findings will allow EPA to regulate GHG emissions from motor vehicles.

State Greenhouse Gas Regulations

Assembly Bill 1493

California AB 1493 (Pavley) was enacted on July 22, 2002. It requires CARB to develop and adopt regulations that reduce GHG emitted by passenger vehicles and light duty trucks. Regulations adopted by CARB apply to 2009 and later model year vehicles. CARB estimates that the regulation will reduce climate change emissions from the light duty passenger vehicle fleet by 18 percent in 2020 and by 27 percent in 2030 (CARB 2004). CARB applied to the federal government for a "waiver" to allow it to implement AB 1493. After some delay, the USEPA finally granted CARB's waiver request on June 30, 2009. As a result of the delay, CARB approved amended regulations in September 2009 that will apply to 2012 through 2016 model year vehicles, resulting in a reduction of 30 percent in GHG emissions by 2016.

Executive Order S-3-05

California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S-3-05, the following GHG emission reduction targets:

- ◆ By 2010, reduce GHG emissions to 2000 levels;
- ◆ By 2020, reduce GHG emissions to 1990 levels;
- ◆ By 2050, reduce GHG emissions to 80 percent below 1990 levels (CA 2005).

The California CAT's report to the Governor contains recommendations and strategies to help ensure the targets in Executive Order S-3-05 are met (CAT 2006).

Assembly Bill 32

In furtherance of the goals established in Executive Order S-3-05, the Legislature enacted AB 32 (Nuñez and Pavley), the California Global Warming Solutions Act of 2006, which Governor Schwarzenegger signed on September 27, 2006. AB 32 represents the first enforceable statewide program to limit GHG emissions from all major industries with penalties for noncompliance.

CARB is responsible for carrying out and developing the programs and requirements necessary to achieve the goals of AB 32—the reduction of California's GHG emissions to 1990 levels by 2020. The first action under AB 32 resulted in CARB's adoption of a report listing three specific early action greenhouse gas emission reduction measures on June 21, 2007. On October 25, 2007, CARB approved an additional six early action GHG reduction measures under AB 32. The early action measures are divided into three categories:

- ◆ Group 1 - GHG rules for immediate adoption and implementation
- ◆ Group 2 - Several additional GHG measures under development
- ◆ Group 3 - Air pollution controls with potential climate co-benefits

The original three adopted early action regulations meeting the narrow legal definition of “discrete early action GHG reduction measures” are:

- ◆ A low-carbon fuel standard to reduce the “carbon intensity” of California fuels;
- ◆ Reduction of refrigerant losses from motor vehicle air conditioning system maintenance to restrict the sale of “do-it-yourself” automotive refrigerants; and
- ◆ Increased methane capture from landfills to require broader use of state-of-the-art methane capture technologies.

The additional six early action regulations adopted on October 25, 2007, also meeting the narrow legal definition of “discrete early action GHG reduction measures,” are:

- ◆ Reduction of aerodynamic drag, and thereby fuel consumption, from existing trucks and trailers through retrofit technology;
- ◆ Reduction of auxiliary engine emissions of docked ships by requiring port electrification;
- ◆ Reduction of perfluorocarbons from the semiconductor industry;

- ◆ Reduction of propellants in consumer products (e.g., aerosols, tire inflators, and dust removal products);
- ◆ Requirement 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; and
- ◆ Restriction on the use of sulfur hexafluoride (SF₆) from non-electricity sectors if viable alternatives are available.

As required under AB 32, on December 6, 2007, CARB approved the 1990 greenhouse gas emissions inventory, thereby establishing the emissions limit for 2020. The 2020 emissions limit was set at 427 MMT CO₂e. The inventory revealed that in 1990, transportation was the largest single sector with 35 percent of the state's total emissions, followed by industrial emissions at 24 percent, imported electricity at 14 percent, in-state electricity generation at 11 percent, residential use at 7 percent, agriculture at 5 percent, and commercial uses at 3 percent. AB 32 does not require individual sectors to meet their individual 1990 GHG emissions inventory; rather, it requires that the total statewide emissions meet the 1990 threshold by 2020.

In addition to the 1990 emissions inventory, CARB also adopted regulations requiring the mandatory reporting of GHG emissions for large facilities on December 6, 2007. The mandatory reporting regulations require annual reporting from the largest facilities in the state, which account for approximately 94 percent of greenhouse gas emissions from industrial and commercial stationary sources in California. About 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 industrial sources that emit over 25,000 tons of carbon dioxide each year from on-site stationary combustion sources. Transportation sources, which account for 38 percent of California's total greenhouse gas emissions, are not covered by these regulations but will continue to be tracked through existing means. Affected facilities begin tracking their emissions in 2008 and began reporting them in 2009, although a phase-in process allows facilities to develop reporting systems and train personnel in data collection. Reported emissions data for 2008 may be based on best available emission data. Beginning in 2010, however, emissions reporting requirements will be more rigorous and will be subject to third-party verification. Verification will take place annually or every three years, depending on the type of facility.

As indicated above, AB 32 requires CARB to adopt a scoping plan indicating how reductions in significant GHG sources will be achieved through regulations, market mechanisms, and other actions. After receiving public input on their discussion draft of the Proposed Scoping Plan released in June 2008, CARB released the Climate Change Proposed Scoping Plan in October 2008 that contains an outline of the proposed state strategies to achieve the 2020 greenhouse gas emission limits. The CARB Governing Board approved the Proposed Scoping Plan on December 11, 2008. Key elements of the Scoping Plan include the following recommendations:

- ◆ Expanding and strengthening existing energy efficiency programs, as well as building and appliance standards;

- ◆ Achieving a statewide renewable energy mix of 33 percent;
- ◆ Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- ◆ Establishing targets for transportation-related greenhouse gas 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 (LCFS); and,
- ◆ 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 the state's long-term commitment to AB 32 implementation.

Under the Scoping Plan, approximately 85 percent of the state's emissions are subject to a cap-and-trade program where covered sectors are placed under a declining emissions cap. The emissions cap incorporates a margin of safety, whereas the 2020 emissions limit will still be achieved even in the event that uncapped sectors do not fully meet their anticipated emission reductions. Emissions reductions will be achieved through regulatory requirements and the option to reduce emissions further or purchase allowances to cover compliance obligations. It is expected that emission reduction from this cap-and-trade program will account for a large portion of the reductions required by AB 32.

Executive Order S-1-07

Executive Order S-1-07 was approved by the Governor on January 18, 2007. The order mandates that a statewide goal shall be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020. It also requires that an LCFS for transportation fuels be established for California. The LCFS rulemaking was approved by the Office of Administrative Law and the regulation became effective on January 12, 2010.

Senate Bill 375

There has also been California legislative activity acknowledging the relationship between land use planning and transportation sector GHG emissions. The California Legislature passed SB 375 (Steinberg) in August 2008 and it was signed by the Governor on September 30, 2008. SB 375 requires CARB to set regional greenhouse gas reduction targets after consultation with local governments. Reductions in GHG emissions would be achieved by, for example, locating housing closer to jobs, retail, and transit. Under the bill, each MPO would be required to adopt a sustainable community strategy to encourage compact development so that the region will meet a target, created by CARB, for reducing GHG emissions. Additionally, SB 375 reforms the environmental review process to create incentives to implement the strategy, especially transit priority projects. CARB's Regional Targets Advisory Committee (RTAC) issued its recommendations for regional GHG reduction targets on September 29, 2009. CARB is

required to act on those recommendations and propose draft targets by June 30, 2010, and adopt final targets by September 30, 2010.

Title 24

California Code of Regulations Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings were first established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. In October 2005, amendments were made to require new homes to use half the energy they used only a decade ago. Energy-efficient buildings require less electricity, and electricity production by fossil fuels results in greenhouse gas emissions. On July 18, 2008, the building code was further amended to include green building requirements. Such requirements mandate reduction in building energy use, conservation of potable water, job-site erosion control, recycling of construction waste, and a range of steps to improve indoor air quality.⁷ Increased energy efficiency results in decreased greenhouse gas emissions. Those amendments went into effect on January 1, 2010.

CARB Proposal for Significance Thresholds for GHGs under CEQA

On October 24, 2008, CARB staff released a Preliminary Draft Staff Proposal: Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under CEQA for determining whether the emissions related to proposed new projects are significant impacts under CEQA. While the proposal is focused on helping lead agencies determine under which conditions a project may be found exempt from the preparation of an EIR, the proposal also provides a guide for establishing significance thresholds for projects for which EIRs would be prepared regardless of the project's climate change impact. According to this proposal, the threshold for determining whether a project's emissions are significant is not zero emissions, but must be a stringent performance-based threshold to meet the requirements of AB 32. If the project meets certain specific yet to be developed performance standards for several categories of emissions, including construction emissions, building energy use, water use, solid waste, and transportation, and the project emits no more than a certain yet to be determined amount of metric tons of carbon equivalents (MT CO₂e) per year, the project's impact would not be significant. According to CARB, California Energy Commission Tier II building energy use standards are proposed to be used, which generally require a reduction in energy usage of 30 percent beyond Title 24 building code requirements. CARB has also proposed a 7,000 MT CO₂e threshold for industrial projects, but has not yet proposed thresholds for residential and commercial projects. The annual threshold does not explicitly include emissions associated with construction- and transportation-related activities.

2009 SB 97 Rulemaking – CEQA Guideline Amendments

On December 30, 2009, the Natural Resources Agency (Agency) adopted CEQA Guidelines amendments for analysis of greenhouse gases (GHGs) required by SB 97 of 2007 (PRC

⁷ California Green Building Standards Code. http://www.documents.dgs.ca.gov/bsc/prpsd_stds/combined_green_et_7_08.pdf.

§21083.05). The full text of the GHG amendments and supporting Statement of Reasons can be found at <http://ceres.ca.gov/ceqa/guidelines/>. The Statement of Reasons provides information useful for both interpreting the adopted amendments, and explaining why other issues were not addressed in the amendments. Practical implications include the following:

- ◆ ***Methods for Determining the Significance of GHG Emissions.*** The GHG amendments require a good-faith effort, based on scientific and factual data to the extent possible, to describe, calculate, or estimate a project's GHG emissions. The Lead Agency has discretion to quantify GHG emissions, or rely on a qualitative analysis or performance standards.
- ◆ ***Mitigating the Impacts of GHG Emissions.*** The GHG amendments give the Lead Agency the option of adopting either on-site mitigation measures, or various types of off-site mitigation measures, including offsets and carbon sequestration.
- ◆ ***Streamlining and Tiering the Analysis of GHG Emissions.*** GHG amendments are included that promote the streamlining and tiering of GHG emissions.
- ◆ ***Analyzing Traffic Congestion and Parking Impacts.*** A shift in CEQA's approach to traffic and parking impacts is included in amendments to the CEQA Appendix G Initial Study checklist.
- ◆ ***Impacts of Climate Change on the Project; Adaptation.*** The amendments modify §15126.2(a) so that it more clearly addresses risks to the project from climate change. This section now requires an EIR to analyze any potentially significant impacts of locating development in hazard areas (e.g., floodplains, coastlines, wildfire risk areas), as identified in hazard maps, risk assessments, or land use plans (see Section 3.10, below).

3.7.1.3 Local

City of Hercules General Plan

The adopted Open Space and Conservation Element contain the following policies related to air quality and pertinent to consideration of the air quality impacts of the proposed Project:

Development within the City shall be condition to reduce air quality impacts during construction and subsequent operation. (Policy 11a)

Incorporate BAAQMD recommendations into General Plan policies for directing regional growth and development. (Program 11a.1)

Implement a dust abatement program for new development [that includes BAAQMD CEQA Guidelines Feasible PM10 Dust Control Measures]. (Program 11b.1)

3.7.2 Existing Conditions

The project area is located in the City, which is located in western Contra Costa County within the boundaries of the San Francisco Bay Area Air Basin (SFBAAB or the basin). The topography and climate of the basin combine to make it an area in which poor air quality could occur. The climate of the Bay Area is Mediterranean in character, with mild, rainy winter weather from November through April and warm, dry weather from June through October. In

summer, the Pacific high-pressure system typically remains near the coast of California. The subsidence of warm air over the cooler marine air associated with the Pacific high creates frequent summer atmospheric temperature inversions. Subsidence inversions may be several hundred to several thousand feet deep, effectively trapping pollutants in a stagnant volume of air near the ground with little dispersion ability. Typically, May through October is considered the ozone smog season. Transport studies have shown precursor emissions generated in the East Bay are often transported to other regions of the Bay Area and beyond (e.g., Central Valley) that are more conducive to the formation of ozone. In winter, the Pacific high-pressure system moves southward, allowing ocean-formed storms to move through the region. The frequent storms and infrequent periods of sustained sunny weather are not conducive to ozone formation. Radiational cooling during the evening, however, sometimes creates thin inversions and concentrations of air pollutant emissions near the ground.

The prevailing wind direction in the project area is from the southwest. Sea breezes dominate the area during the spring and summer months. Maximum wind speeds in the area reach approximately 9 to 10 miles per hour during the summer months. The dominance of the sea breeze results in a mild, relatively cool climate. Low clouds and fog are common in spring and summer. The project site often experiences persistent afternoon winds in the spring and summer months.

3.7.2.1 Regional Air Quality

The determination of whether a region's air quality is healthful or unhealthful is made by comparing contaminant levels in ambient air samples to national and state standards. Health-based air quality standards have been established by California and the federal government for the following criteria air pollutants: ozone (O₃), CO, nitrogen dioxide (NO₂), sulfur dioxide (SO₂), respirable particulate matter less than 10 microns in diameter (PM₁₀), fine particulate matter less than 2.5 microns in diameter (PM_{2.5}), and lead (Pb). These standards were established to protect sensitive receptors with a margin of safety from adverse health effects due to exposure to air pollution. California has also established standards for sulfates, visibility-reducing particles, hydrogen sulfide, and vinyl chloride. The state and national ambient air quality standards for each of the monitored pollutants and their effects on health are summarized in Table 3.7-3.

A region's air quality is considered to be in attainment of the state standards if the measured ambient air pollutant levels for O₃, CO, SO₂, NO₂, PM₁₀, PM_{2.5}, and visibility-reducing particles are not exceeded, and all other standards are not equaled or exceeded at any time in any consecutive three year period. The National Ambient Air Quality Standards (NAAQS) for CO, SO₂, and NO₂ are not to be exceeded more than once per year. The NAAQS for O₃, PM₁₀, and PM_{2.5} are based on statistical calculations over one- to three-year periods, depending on the pollutant. The project site is located within the SFBAAB, which includes all of Alameda, Contra Costa, Marin, Napa, San Mateo, San Francisco, and Santa Clara counties as well as the southern half of Sonoma County and the southwestern portion of Solano County. The region is named for its geographical formation surrounding the San Francisco Bay. The air quality in the basin is affected by the pollutants generated within dense population centers, heavy vehicular

traffic, and industry. However, as mentioned above, coastal sea breezes tend to transport pollutants generated within the SFBAAB to inland locations such as the Central Valley.

Table 3.7-3 Ambient Air Quality Standards

Air Pollutant	State Standard	Federal Primary Standard	Most Relevant Health Effects
Ozone	0.070 ppm, 8-hr. avg. 0.09 ppm, 1-hr. avg.	0.075 ppm, 8 hr avg. (3 year average of annual 4th-highest daily maximum)	(a) Short-term exposures: (1) Pulmonary function decrements and localized lung edema in humans and animals; and (2) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (b) Long-term exposures: Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (c) Vegetation damage; and (d) Property damage
Carbon Monoxide	9.0 ppm, 8-hr avg. 20 ppm, 1-hr avg.	9 ppm, 8-hr avg. 35 ppm, 1-hr avg.	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; and (d) Possible increased risk to fetuses
Nitrogen Dioxide	0.18 ppm, 1-hr avg. 0.030 ppm, annual arithmetic mean	0.053 ppm, annual arithmetic mean	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; and (c) Contribution to atmospheric discoloration
Sulfur Dioxide	0.04 ppm, 24-hr avg. 0.25 ppm, 1-hr. avg.	0.030 ppm, annual arithmetic mean 0.14 ppm, 24 hr avg.	(a) Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in person with asthma
Respirable Particulate Matter (PM ₁₀)	20 µg/m ³ , annual arithmetic mean 50 µg/m ³ , 24-hr avg.	150 µg/m ³ , 24-hr avg.	(a) Excess deaths from short-term exposures and exacerbation of symptoms in sensitive patients with respiratory disease; and (b) Excess seasonal declines in pulmonary function, especially in children
Fine Particulate Matter (PM _{2.5})	12 µg/m ³ , annual arithmetic mean	15 µg/m ³ , annual arithmetic mean (3-yr average) 35 µg/m ³ , 24 hr avg. (3-yr average of 98th percentile)	(a) Increased hospital admissions and emergency room visits for heart and lung disease; (b) Increased respiratory symptoms and disease; and (c) Decreased lung function and premature death
Sulfates	25 µg/m ³ , 24-hr avg.	None	(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; and (f) Property damage
Lead ¹	1.5 µg/m ³ , 30-day avg.	1.5 µg/m ³ , calendar quarterly average 0.15 µg/m ³ , rolling 3-month average	(a) Increased body burden; and (b) Impairment of blood formation and nerve conduction
Visibility-Reducing Particles	In sufficient amount to produce extinction coefficient of 0.23/km due to particles when relative humidity less than 70%, 8-hr average (10 am to 6 pm)	None	Visibility impairment on days when relative humidity is less than 70 percent

Air Pollutant	State Standard	Federal Primary Standard	Most Relevant Health Effects
Hydrogen Sulfide	0.03 ppm, 1 hr avg	None	Odor annoyance
Vinyl Chloride ¹	0.01 ppm, 24-hr avg.	None	Known carcinogen

Source: BAAQMD 2010c
 µg/m³ = microgram per cubic meter.
 ppm = parts per million by volume.

¹ 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.

The air pollutants within the basin are primarily generated by two categories of sources: stationary and mobile. Stationary sources are known as “point sources” which have one or more emission sources at a single facility, or “area sources” which are widely distributed and produce many small emissions. Point sources are usually associated with manufacturing and industrial uses and include sources such as refinery boilers or combustion equipment that produce electricity or process heat. Examples of area sources include residential water heaters, painting operations, lawn mowers, agricultural fields, landfills, and consumer products, such as barbecue lighter fluid or hair spray. Mobile sources refer primarily to operational and evaporative emissions from motor vehicles.

To identify ambient concentrations of the criteria pollutants, the BAAQMD operates 31 air quality monitoring stations throughout the basin. The nearest monitoring station is approximately three miles southwest of the project site, located at 865 D Rumrill Boulevard in San Pablo. This monitoring station measures CO, O₃, NO₂, SO₂, and PM₁₀.

Table 3.7-4, Ambient Pollutant Concentrations Measured near the Project Site by Year, lists the concentrations registered and the exceedances of California Ambient Air Quality Standards (CAAQS) and the NAAQS that have occurred at this monitoring station from 2004 through 2008. During this period, the station registered one day above the state 1-hour ozone standard in 2004, along with a total of five days above the state 24-hour PM₁₀ standard, one in 2004 and two each in 2006 and 2007. At the closest monitoring station that monitors PM_{2.5} (Treat Boulevard station in Concord, approximately 14 miles east of the project site), the federal 24-hour PM_{2.5} standard was exceeded once in 2004. No other exceedances of the state or federal standards for NO₂, CO, or SO₂ were registered at these stations between 2004 and 2008.

Table 3.7-4 Ambient Pollutant Concentrations Measured Near the Project Site by Year

Pollutant	Standards ¹	Year				
		2004	2005	2006	2007	2008
OZONE (O3)						
Maximum 1-hour concentration (ppm)		0.105	0.066	0.061	0.074	0.084
Maximum 8-hour concentration (ppm)		0.069	0.057	0.050	0.051	0.064
Number of days exceeding state 1-hour standard	0.09 ppm	1	0	0	0	0
Number of days exceeding federal 8-hour standard ²	0.075 ppm	0	0	0	0	0
CARBON MONOXIDE (CO)						
Maximum 1-hour concentration (ppm)		3.2	2.8	2.5	2.4	2.5

Pollutant	Standards ¹	Year				
		2004	2005	2006	2007	2008
Maximum 8-hour concentration (ppm)		1.8	1.3	1.4	1.2	1.3
Number of days exceeding state 8-hour standard	9.0 ppm	0	0	0	0	0
Number of days exceeding federal 8-hour standard	9 ppm	0	0	0	0	0
Maximum 1-hour concentration (ppm)		0.055	0.054	0.055	0.052	0.062
Annual Average (ppm)		0.013	0.012	0.013	0.012	0.010
Number of days exceeding state 1-hour standard ³	0.18 ppm	0	0	0	0	0
SULFUR DIOXIDE (SO₂)						
Maximum 1-hour concentration in ppm		0.019	0.025	0.017	0.017	0.018
Maximum 24-hour concentration in ppm		0.005	0.006	0.005	0.005	0.004
Annual arithmetic mean concentration (ppm)		0.002	0.002	0.002	0.002	0.001
Number of days exceeding state 1-hour standard	0.25 ppm	0	0	0	0	0
Number of days exceeding state 24-hour standard	0.04 ppm	0	0	0	0	0
Number of days exceeding federal 24-hour standard	0.14 ppm	0	0	0	0	0
PARTICULATE MATTER (PM₁₀)						
Maximum 24-hour concentration (µg/m ³) ⁵		63.7	41.6	61.5	57.4	44.3
Maximum 24-hour concentration (µg/m ³) ⁶		62.0	40.2	58.2	54.4	41.8
Annual arithmetic mean concentration (µg/m ³) ⁶		21.0	18.4	20.5	19.8	20.1
Number of samples exceeding state 24-hour standard	50 µg/m ³	1	0	2	2	0
Number of samples exceeding federal 24-hour standard	150 µg/m ³	0	0	0	0	0
PARTICULATE MATTER (PM_{2.5})⁴						
Maximum 24-hour concentration (µg/m ³)		73.7	48.9	62.1	46.2	60.3
Annual arithmetic mean concentration using federal methods (µg/m ³)		10.8	9.1	9.5	8.4	8.7
98th percentile of the 24-hour values		38.1	33.4	33.6	34.9	31.1
Number of samples exceeding federal 24-hour standard ⁷	65/35 µg/m ³	1	0	0	0	0

Sources:

(i) California Air Resources Board 2010a

(ii) USEPA Air Quality Database (USEPA 2007c).

na = Insufficient or no data available to determine value.

¹ Parts by volume per million of air (ppm), micrograms per cubic meter of air (µg/m³) or annual arithmetic mean (aam).

² The federal 8-hour ozone standard was changed to 0.075 ppm in 2008.

³ The state NO₂ standard was revised to 1-hour average of 0.18 ppm and a new annual arithmetic mean standard of 0.030 ppm was adopted in April 2008. Statistics shown are based on the previous 1-hour standard of 0.25 ppm. The federal standard is annual arithmetic mean (AAM) of 0.053 ppm.

⁴ Data are from the monitoring station in Concord at Treat Boulevard, the closest monitoring that that monitors that fine particulate pollutant.

⁵ Using state methods for sampling.

⁶ Using federal methods for sampling.

⁷ The federal PM_{2.5} standard was revised from 65 to 35 µg/m³ in September 2006. Exceedances for regulatory purposes are based on the 98th percentile value, rather than the maximum 24-hour value and are shown for the current federal PM_{2.5} standard.

NOTES:

Sulfates are monitored at Arkansas Street Station, San Francisco. Sulfates have not exceeded the state standard of 25 µg/m³ for more than 20 years.

Lead is not monitored in Contra Costa County. Limited (i.e., 2004 or 2005) data are available from the Whitney Circle station in San Francisco

3.8 Noise and Vibration

3.8.1 Noise and Vibration Definitions and Methodology

3.8.1.1 Airborne Noise

The following provides an overview of the existing noise environment, including relevant regulations related to both project construction and operations. This section relies in part on earlier studies conducted by Illingworth and Rodkin (2009). People define noise as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. The objectionable nature of sound could be caused by its pitch or its loudness. Pitch is the height or depth of a tone or sound, depending on the relative rapidity (i.e., frequency) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. Loudness is the amplitude of sound waves combined with the reception characteristics of the ear. Amplitude may be compared with the height of an ocean wave.

In addition to the concepts of pitch and loudness, there are several noise measurement scales which are used to describe noise in a particular location. A decibel (dB) is a unit of measurement which indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 dBs represents a ten-fold increase in acoustic energy, while 20 dBs is 100 times more intense, 30 dBs is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its decibel level. Each 10-dB increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities. Technical terms for noise are defined in Table 3.8-1.

There are several methods of characterizing sound. The most common in California is the A-weighted sound level (dBA). All sound levels discussed in this section utilize the A-weighting scale. This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Representative outdoor and indoor noise levels in units of dBA are shown in Table 3.8-2. Because sound levels can vary markedly over a short period, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This energy-equivalent sound/noise descriptor is termed Leq. The most common averaging period is hourly, but Leq can describe any series of noise events of arbitrary duration.

The scientific instrument used to measure noise is the sound level meter. Type 1 sound level meters, the most common type used for environmental noise measurements, can accurately measure noise levels to within approximately plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways, airports, and rail lines. The accuracy of the predicted models is greater for receptors close to the noise source. The models are accurate to within approximately 2 dBA for receptors within about 500 feet from the noise source, but are less accurate at greater distances, primarily because of the unpredictable influences of atmospheric and terrain effects.

Table 3.8-1 Definitions of Acoustical Terms

Term	Definitions
Decibel (dB)	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20 micropascals (μPa).
Sound pressure level	Sound pressure is the sound force per unit area, usually expressed in micropascals (micronewtons per square meter), where 1 pascal is the pressure resulting from a force of 1 newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels. Sound pressure level is measured by a sound level meter.
Frequency (Hz)	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and Ultrasonic sounds are above 20,000 Hz.
A-weighted sound level (dBA)	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent noise level (L_{eq})	The average A-weighted noise level during a given measurement period. The hourly L_{eq} is denoted as $L_{eq}[h]$.
Community Noise Equivalent Level (CNEL)	The average A-weighted noise level during a 24-hour day, obtained after the addition of a 5-dBA penalty for evening noise from 7:00 PM to 10:00 PM and a 10-dBA penalty for nighttime noise from 10:00 PM and 7:00 AM.
Day/Night Noise Level (L_{dn})	The average A-weighted noise level during a 24-hour day, obtained after the addition of a 10-dBA penalty for nighttime noise from 10:00 PM and 7:00 AM.
L10, L50, L90	The A-weighted noise levels that are exceeded 10%, 50%, or 90% of the time during the measurement period.
Ambient noise level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, time of occurrence, the tonal or informational content, as well as the prevailing ambient noise level.

Since the sensitivity to noise increases during the evening and at night because excessive noise interferes with the ability to sleep, 24-hour descriptors were developed that incorporate artificial noise penalties added to quiet-time noise events. The CNEL is a measure of the cumulative noise exposure in a community, with a 5-dB penalty added to evening (i.e., 7:00 p.m. - 10:00 p.m.) noise levels and a 10-dB penalty added to nighttime (10:00 p.m. - 7:00 a.m.) noise levels. The Day/Night Average Sound Level, L_{dn} , is essentially the same as CNEL, with the exception that the evening time period is dropped and all occurrences during this three-hour period are grouped into the daytime period.

3.8.1.2 Vibration

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several methods are typically used to quantify the amplitude of vibration including peak particle velocity (PPV) and root mean square (RMS) velocity. PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. RMS velocity is defined as the average of the squared amplitude of the signal. PPV and RMS are both used to evaluate human response to vibration.

Table 3.8-2 Typical Noise Levels in the Environment

Common Outdoor Noise Source	Noise Level (dBA)	Common Indoor Noise Source
	120	
Jet fly-over at 300 meters		Rock concert
	110	
Pile driver at 20 meters	100	
		Night club with live music
	90	
Large truck pass by at 15 meters		
	80	Noisy restaurant
		Garbage disposal at 1 meter
Gas lawn mower at 30 meters	70	Vacuum cleaner at 3 meters
Commercial/Urban area daytime		Normal speech at 1 meter
Suburban expressway at 90 meters	60	
Suburban daytime		Active office environment
	50	
Urban area nighttime		Quiet office environment
	40	
Suburban nighttime		
Quiet rural areas	30	Library
		Quiet bedroom at night
Wilderness area	20	
	10	Quiet recording studio
Threshold of human hearing	0	Threshold of human hearing

The reaction of humans and effects on buildings from continuous levels of vibration is shown on Table 3.8-3. As discussed previously, annoyance is a subjective measure and vibrations may be found to be annoying at much lower levels than those shown, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying.

Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage. In high noise environments, which are more prevalent where ground-borne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows.

Construction activities can cause vibration that varies in intensity depending on several factors. The use of pile driving and vibratory compaction equipment typically generates the highest

construction related ground-borne vibration levels. Because of the impulsive nature of such activities, the use of the peak PPV has been routinely used to measure and assess ground-borne vibration and almost exclusively to assess the potential of vibration to induce structural damage and the degree of annoyance for humans.

Table 3.8-3 Reaction of People and Damage to Buildings for Continuous Vibration Levels

Vibration Level, PPV (in/sec)	Human Reaction	Effect on Buildings
0.006 to 0.019	Threshold of perception: Possibility of intrusion	Vibration unlikely to cause damage of any type
0.08	Vibrations readily perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
0.10	Level at which continuous vibrations begin to annoy people	Virtually no risk of "architectural" damage to normal buildings
0.20	Vibrations annoying to people in buildings	Threshold at which there is a risk of "architectural" damage to normal dwellings such as plastered walls or ceilings.
0.4 to 0.6	Vibrations considered unpleasant by people subjected to continuous vibrations	Vibration at this level would cause "architectural" damage and possibly minor structural damage.

Source: Caltrans 2002

The two primary concerns with construction-induced vibration, the potential to damage a structure and the potential to interfere with the enjoyment of life, are evaluated against different vibration limits. Studies have shown that the threshold of perception for the average person is a PPV in the range of 0.2 to 0.3 millimeters per second (mm/sec) (0.008 to 0.012 inches per second). Human perception to vibration varies with the individual and is a function of physical setting and the type of vibration. Persons exposed to elevated ambient vibration levels, such as people in an urban environment, may tolerate a higher vibration level.

Vibration damage to buildings can be classified as cosmetic only, such as minor cracking of building elements, or may elevate to the level of structural damage, which could threaten the integrity of the building. Safe vibration limits that can be applied to assess the potential for damaging a structure vary by researcher and there is no general consensus as to what amount of vibration may pose a threat for structural damage to the building. Construction-induced vibration that can be detrimental to a building is very rare and has only been observed in instances where the structure is at a high state of disrepair and the construction activity occurs immediately adjacent to the structure.

3.8.1.3 Train Vibration

Railroad operations are a potential source of substantial ground vibration, depending on the distance, type and speed of trains and the type of railroad track. Typical vibration background levels in residential areas are 50VdB or lower, well below the threshold of perception for most humans. Internal sources include HVAC systems and human activities such as foot traffic and shutting/opening doors. However, train traffic is one potential external source. There are differences in the potential for vibration related effects between freight and passenger trains, primarily due to the duration. Passenger trains generally pass more quickly than freight trains

due to length of the train (seconds v. minutes) and the potential for vibration annoyance is therefore greater with freight train traffic.

3.8.2 Regulatory Framework

Federal, state, and local regulations and policies are established to limit noise exposure at noise sensitive land uses.

3.8.2.1 Federal Regulations

U.S. Environmental Protection Agency

The USEPA, pursuant to the Noise Control Act of 1972, established guidelines for acceptable noise levels for sensitive receivers such as residential areas, schools, and hospitals. The levels set forth are 55 dBA Ldn for outdoor use areas, and 45 dBA Ldn for indoor use areas. These provide guidance for local jurisdictions, but do not have regulatory enforceability.

U.S. Department of Housing and Urban Development

The U.S. Department of Housing and Urban Development (HUD) has also established guidelines for acceptable noise levels for sensitive receivers such as residential areas, schools, and hospitals. The HUD noise levels include a two-pronged guidance, one for the desirable noise level and the other for the maximum acceptable noise level. The desirable noise level established by HUD conforms to the USEPA guidance of 55 dBA Ldn for outdoor use areas of residential land uses and 45 dBA Ldn for indoor use areas of residential land uses. The secondary HUD standard establishes a maximum acceptable noise level of 65 dBA for outdoor use areas of residential areas. These standards are enforceable through eligibility for HUD funding and project support. Residential developments with noise levels exceeding the maximum acceptable HUD standard have restricted eligibility for HUD funding and loan programs, including Federal Housing Administration loans.

Occupational Safety and Health Administration

The Occupational Safety and Health Administration (OSHA) regulates noise levels in industrial environments under the Department of Labor. OSHA regulations require that the time-averaged noise level of any work environment be limited to 90 dBA for any 8-hour period. Work environments exceeding 85 dBA for an 8-hour period require a hearing conservation program for workers.

Federal Transit Administration

The FTA has set guidelines for transit projects to control future project related-noise level increases at sensitive land uses such as residential areas, schools, recreation areas, hospitals, etc. Noise impacts from transit projects are to be evaluated using the FTA Transit Noise and Vibration Impact Assessment manual (FTA 2006). Figure 3.8-1 shows the FTA's noise impact criteria. The FTA has divided the land uses into three categories. Category 1 includes land where quiet is an essential element for operation such as outdoor amphitheatres, Category 2

includes residences and areas where people generally sleep, and Category 3 includes institutional buildings where quiet is important such as for schools, libraries, and churches. Figure 3.8-1 shows that for a residential land use with an Ldn between 60 dBA and 70 dBA, an increase greater than 5 dBA would be considered severe. In addition to providing guidance for assessing noise impacts, the FTA manual details procedures for assessing vibration impacts from transit projects.

3.8.2.2 State Regulations

California Government Code Section 63502(g)

The State of California Department of Health Services, Environmental Health Division, has published recommended guidelines for noise and land use compatibility referred to as the Guidelines for Noise and Land Use Compatibility (the State Guidelines). The State Guidelines, illustrated in Table 3.8-4, indicate that residential land uses and other noise-sensitive receptors generally should be located in areas where outdoor ambient noise levels do not exceed 65 to 70 dBA Ldn (or CNEL). The Department of Health Services does not mandate application of this compatibility matrix to development projects. However, each jurisdiction is required to consider the State Guidelines when developing its general plan noise element and when determining acceptable noise levels within its community.

Under the State Guidelines, an exterior noise level of 70 dBA Ldn/CNEL is typically the dividing line between an acceptable and unacceptable exterior noise environment for all noise-sensitive uses, including schools, libraries, churches, hospitals, day care centers, and nursing homes of conventional construction. This standard also applies to residential uses. Noise levels below 75 dBA Ldn/CNEL are typically acceptable for office and commercial buildings, while levels up to 80 dBA Ldn/CNEL are typically acceptable for industrial uses.

Title 24, California Code of Regulations

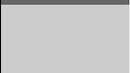
California has established noise standards in Title 24 of the California Code of Regulations—the State of California Noise Insulation Standards. These standards state that the “interior CNEL attributable to exterior sources shall not exceed an annual CNEL of 45 dBA in any habitable room,” and that multi-family residential buildings or structures to be located near an existing or adopted major thoroughfare, railroad, rapid transit line, or industrial noise source within exterior CNEL contours of 60 dBA or greater shall require an acoustical analysis showing that the building has been designed to limit interior noise to a CNEL of 45 dBA.

3.8.2.3 Local Regulations

City of Hercules General Plan – Noise Element

Policy 2: New non-residential land development projects shall meet acceptable exterior noise level standards set forth in Table 6 of the Noise Element, which lists land use compatibility for community noise environments in the City. The noise contour map on file at City Hall shall be used to screen projects to determine, if acoustical studies will be required.

Table 3.8-4 Land Use Compatibility for Community Noise Environments

Land Use Category	Community Noise Exposure Ldn or CNEL, dBA					
	55	60	65	70	75	80
Residential – Low Density Single-Family Duplex, Mobile Homes	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Unacceptable	Clearly Unacceptable	Clearly Unacceptable
Residential – Multi-Family	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Unacceptable	Clearly Unacceptable	Clearly Unacceptable
Transient Lodging – Motels, Hotels	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Unacceptable	Clearly Unacceptable	Clearly Unacceptable
Schools, Libraries, Churches, Hospitals, Nursing Homes	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Unacceptable	Clearly Unacceptable	Clearly Unacceptable
Sports Arena, Outdoor Spectator Sports	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Unacceptable	Clearly Unacceptable	Clearly Unacceptable
Playgrounds, Neighborhood Parks	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Unacceptable	Clearly Unacceptable	Clearly Unacceptable
Golf Courses, Riding Stables, Water Recreation, Cemeteries	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Unacceptable	Clearly Unacceptable	Clearly Unacceptable
Office Buildings, Business Commercial and Professional	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Unacceptable	Clearly Unacceptable	Clearly Unacceptable
Industrial Manufacturing Utilities, Agriculture	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Unacceptable	Clearly Unacceptable	Clearly Unacceptable
Auditoriums Concert Halls	Normally Acceptable	Normally Acceptable	Normally Unacceptable	Clearly Unacceptable	Clearly Unacceptable	Clearly Unacceptable
Amphitheaters	Normally Unacceptable	Clearly Unacceptable	Clearly Unacceptable	Clearly Unacceptable	Clearly Unacceptable	Clearly Unacceptable
Interpretation						
	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.					
Source: California, State of. Governor’s Office of Planning and Research. 2003						

Policy 3: Protect existing noise-sensitive land uses from long-term noise impacts generated by new projects. The city shall use the following criteria to judge the significance of long-term noise impacts on existing noise-sensitive land uses:

- ◆ Noise level increases resulting from traffic associated with new projects will be considered significant if: (1) the noise level increase is 5 dBA Ldn or greater and the future noise level is less than 60 dBA Ldn; or (2) the noise level increase is 3 dBA Ldn or greater and the future noise level is 60 dBA Ldn or greater.

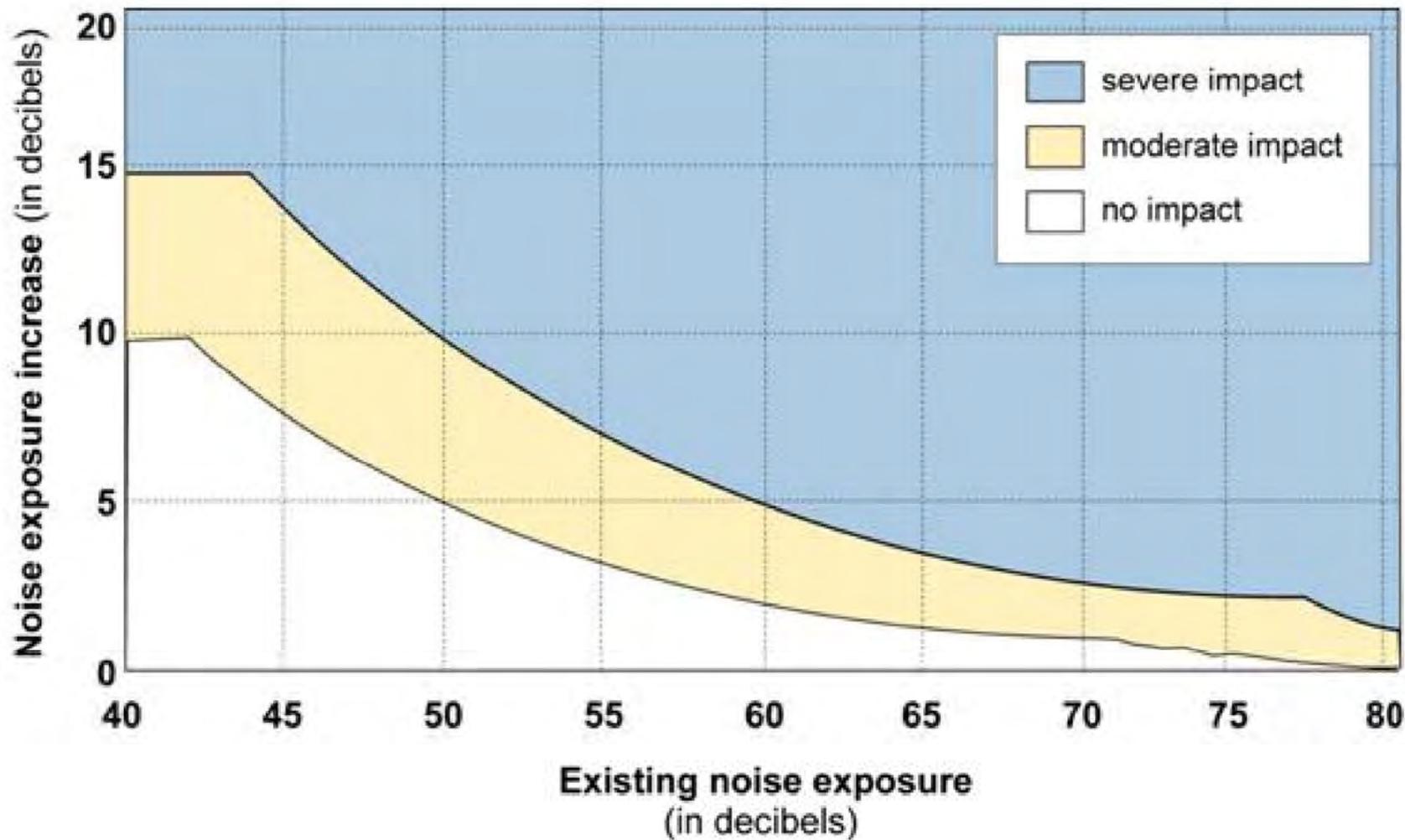
Policy 6: Control the level of noise at noise-sensitive land uses generated by construction activities through implementation of the following measures:

- ◆ For construction near noise-sensitive areas, as determined by the Community and Business Development Department, require that noisy construction activities (including truck traffic) be scheduled for periods, according to construction permit, to limit impact on adjacent residents or other sensitive receptors.
- ◆ Develop a construction schedule that minimizes potential cumulative construction noise impacts and accommodates particularly noise-sensitive periods for nearby land uses (e.g., for schools, churches, etc.)
- ◆ Where feasible, require that holes for driven piles be pre-drilled to reduce the level and duration of noise impacts.
- ◆ Where feasible, construct temporary solid noise barriers between source and sensitive receptor(s) to reduce offsite propagation of construction noise. This measure could reduce construction noise by up to 5 decibels.
- ◆ Require internal combustion engines used for construction purposes to be equipped with a properly operating muffler of a type recommended by the manufacturer. Also, require impact tools to be shielded per manufacturer's specifications

3.8.3 Existing Conditions

3.8.3.1 Existing Noise Sources

The primary noise sources in the City are transportation-related, including motor vehicle traffic and trains. The major roadways in the vicinity of the project area include I-80, SR-4, San Pablo Avenue, and Sycamore Avenue. The vehicle mix on I-80 and SR-4 is characterized by a substantial number of medium and heavy trucks, which generate more noise than automobiles. Two rail lines extend through the city, the UPRR line that runs along the shoreline of San Pablo Bay and the Atchison, Topeka and Santa Fe (AT&SF) line that runs through the City in an east-west orientation.



Note: Noise exposure is in terms of $L_{eq}(h)$ for Category 1 land uses and L_{dn} for Category 2 land uses.

Figure 3.8-1 Federal Transit Administration
Noise Impact Criteria for Transit Projects

City of Hercules
Hercules Intermodal Transit Facility
Contra Costa County, California

Data Sources: Map information was compiled from the best available sources. No Warranty is made for its accuracy or completeness. Topographic Base Map, Aerial photography from ESRI ArcGIS Online; Hydrography from National Hydrography Dataset; NWI Data from U.S. Fish and Wildlife Service and soils data from USDA NRCS Soil Survey. Data is State Plane Feet, NAD83 Zone 3.



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3.8.3.2 Noise monitoring conducted for the General Plan Noise Element indicates that the AT&SF Railroad produces noise levels of approximately 75 dBA Ldn at 100 feet and the UPRR produces noise levels of approximately 68 dBA Ldn at 100 feet. Individual train passages could produce episodic noise levels of 80 to 85 dBA. According to the General Plan, the relatively high Ldn levels are a result of late night and early morning train passages (due to the 10-dBA penalty given to sounds occurring between 10 p.m. and 7 a.m.).**Sensitive Receptors**

Some land uses are more sensitive to noise levels than others, due to the amount of noise exposure (in terms of both time and insulation from noise) and the types of activities typically involved. Residences, motels and hotels, schools, libraries, churches, hospitals, nursing homes, auditoriums, and parks and outdoor recreation areas are more sensitive to noise than are commercial and industrial land uses. Based on this definition, future workers and users of the proposed project would not be considered sensitive receptors, however, the open space/riparian corridors along Refugio Creek and Hercules Point would be considered noise-sensitive land uses.

3.8.3.3 Existing Noise Environment

The project site borders San Pablo Bay on the north and west, open land designated for residential and commercial development on the east, and residential and commercial development on the south. The dominant noise sources in the area are freight and passenger train pass-bys.

Noise Measurement Locations in the City of Hercules

Illingworth & Rodkin, Inc. (2009) conducted a noise monitoring survey on Monday, January 26, 2009 from about 1:00 p.m. to about 12:00 p.m. on Thursday, January 28, 2009. The monitoring times and days were selected as “typical” of a normal workday and to fit into the project delivery schedule. Noise levels were measured along the UPRR right-of-way and noise-sensitive off-site locations in the vicinity of the project site. The off-site locations were chosen to represent residential land uses. The noise measurement location along the UPRR right-of-way was selected to measure exiting noise levels at the project site. The noise monitoring survey included seven locations at the project site and its vicinity as shown in Figure 3.8-2. Three of the noise measurements were 48 hours in duration (LT-1, LT-2, and LT-3). The other four noise measurements were 10 minutes in duration (ST-1, ST-2, ST-3, and ST-4).

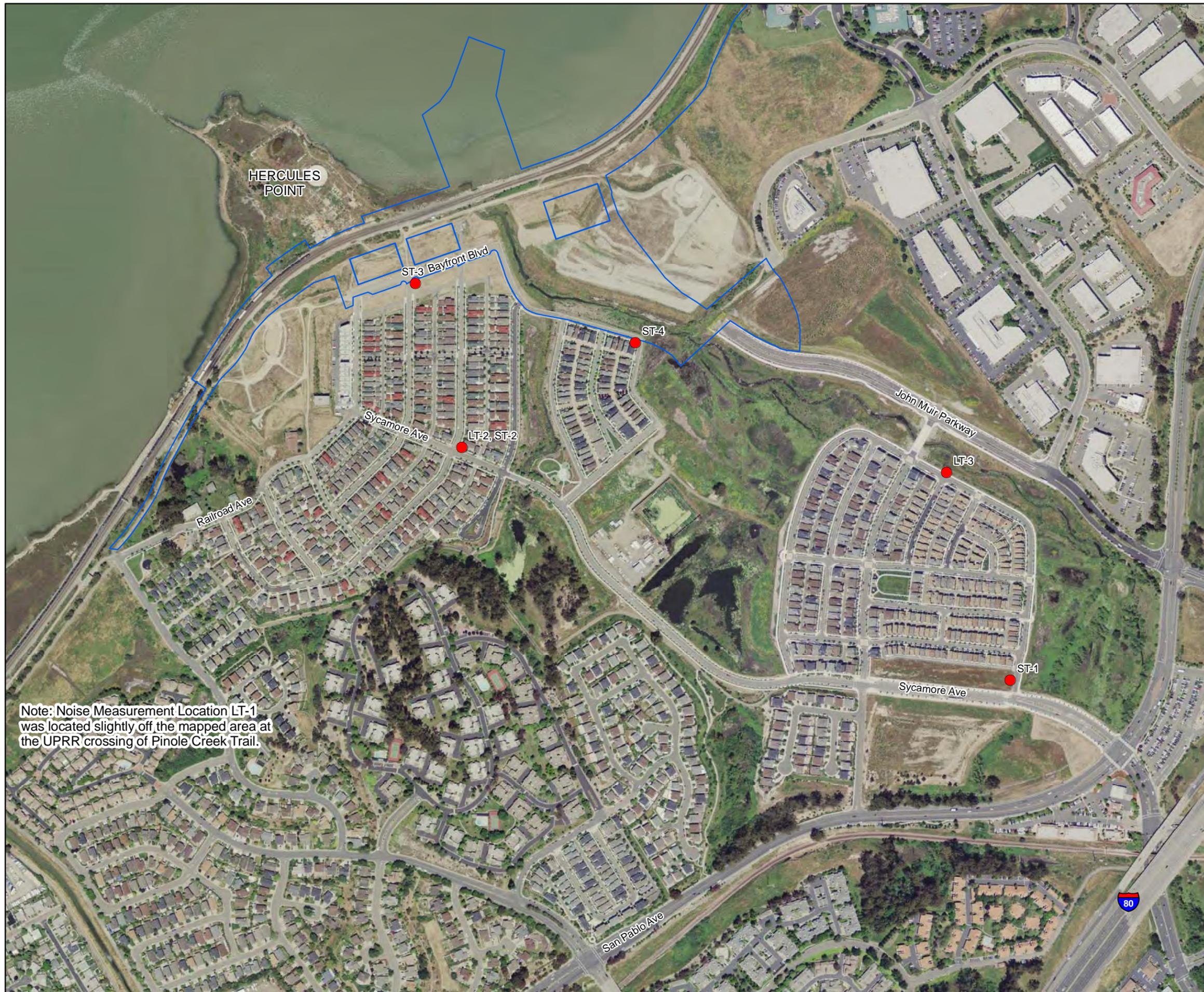
Noise measurement location LT-1 was made to quantify ambient noise levels in the project vicinity. The noise measurement was located about 160 feet from the center of the UPRR Railroad tracks along the Pinole Creek Trail. This location was approximately 400 feet from an at-grade crossing, requiring passing trains to sound their warning horns. Train pass-bys and horns were the major sources of environmental noise at this location. Maximum instantaneous levels were typically between 75 and 85 dBA Lmax. The data indicate 45 to 50 events during a 24-hour period. Hourly average noise levels typically ranged from about 52 to 65 dBA Leq during daytime hours and from about 39 to 67 dBA Leq at night. Hourly average noise levels containing train events, especially during the nighttime, controlled the day-night average noise level calculated for the measurement period. The calculated day-night average noise level at location LT-1 was 68 dBA Ldn.

Noise measurement location LT-2 was selected to quantify ambient noise levels at the residences along Sycamore Avenue and Promenade Street. The noise measurement was located about 25 feet from the center of Sycamore Avenue at Promenade Street. Vehicular traffic along Sycamore Avenue and distant train pass-bys were the major sources of environmental noise at this location. Hourly average noise levels typically ranged from about 58 to 74 dBA Leq during daytime hours and from about 47 to 57 dBA Leq at night. The calculated day-night average noise level at location LT-2 was 61 dBA Ldn.

Noise measurement LT-3 was located at South Front Street near Cabrillo Lane. Distant train pass-bys were the primary sources of environmental noise at this location, while vehicle traffic on nearby streets was a secondary source of noise. Hourly average noise levels typically ranged from about 50 to 72 dBA Leq during daytime hours and from about 47 to 58 dBA Leq at night. The calculated day-night average noise level at location LT-3 was 61 dBA Ldn.

Short-term noise measurement locations ST-1, ST-2, ST-3, and ST-4 completed the noise monitoring survey. Short-term measurements (10-minute duration) were intended to characterize peak-hour traffic noise levels near roadways, as opposed to the long-term measurements (48-hour duration), which were intended to characterize overall ambient noise levels in the project vicinity. The data are summarized in Table 3.8-5. At location ST-1 the dominant source of noise during the measurement was traffic along Sycamore Avenue. At location ST-2, the primary source of noise was also vehicular traffic along Sycamore Avenue. The third short-term noise measure (ST-3) was conducted at the intersection of Bayfront Boulevard and Earnest Street, and about 330 feet from the railroad tracks. Measurement ST-4 was made at the intersection of Sanderling Drive and Sanderling Drive. The primary noise source at these locations was traffic on nearby streets.

An additional long-term noise measurement was made at location (LT-4) from 4:00 p.m. on January 26, 2009 to 2:00 p.m. on January 28, 2009 at a site located about 140 feet from the UPRR tracks near the Martinez Amtrak Station (Figure 3.8-3). Although there are substantial design differences between the Martinez Station and the proposed Hercules ITC, this site was selected to obtain noise readings similar to the conditions expected after the proposed Hercules ITC is constructed. This noise measurement location was about 175 feet south of the at-grade railroad crossing. Railroad train events, including train warning whistles, substantially increased noise levels at this location. Maximum instantaneous levels were typically 90 to 105 dBA Lmax. The data reflect the same train events monitored in the City of Hercules. Train warning horns and bus traffic at the bus station located about 400 feet from this noise measurement location were the major sources of environmental noise. Hourly average noise levels typically ranged from about 63 to 78 dBA Leq during daytime hours and from about 45 to 75 dBA Leq at night. Hourly average noise levels containing train events, especially during the nighttime, controlled the day-night average noise level calculated for the measurement period. The calculated day-night average noise level at location LT-4 was 76 dBA Ldn.



Legend

- Noise Measurement Locations
- Project Boundary

Note: Noise Measurement Location LT-1 was located slightly off the mapped area at the UPRR crossing of Pinole Creek Trail.

1 in = 500 ft (at tabloid layout)

0 62.5 125 250 Meters

0 250 500 1,000 Feet

N

Figure 3.8-2: Noise Measurement Locations in Hercules

City of Hercules
 Hercules Intermodal Transit Facility
 Contra Costa County, California

Data Sources: Map information was compiled from the best available sources. No Warranty is made for its accuracy or completeness. Topographic Base Map, Aerial photography from ESRI ArcGIS Online; Hydrography from National Hydrography Dataset; NWI Data from U.S. Fish and Wildlife Service and soils data from USDA NRCS Soil Survey. Data is State Plane Feet, NAD83 Zone 3



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Legend

- Noise Measurement Locations

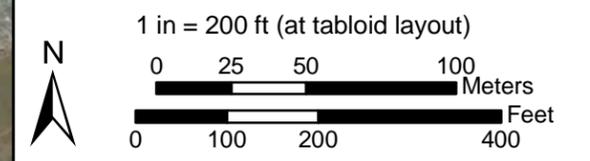


Figure 3.8-3: Noise Measurement Locations at the Station in Martinez

City of Hercules
 Hercules Intermodal Transit Facility
 Contra Costa County, California

Data Sources: Map information was compiled from the best available sources. No Warranty is made for its accuracy or completeness. Topographic Base Map, Aerial photography from ESRI ArcGIS Online; Hydrography from National Hydrography Dataset; NWI Data from U.S. Fish and Wildlife Service and soils data from USDA NRCS Soil Survey. Data is State Plane Feet, NAD83 Zone 3



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Table 3.8-5 Summary of Short-Term Noise Data

Noise Measurement Location	L1 (dBA)	L10 (dBA)	L50 (dBA)	L90 (dBA)	Leq (dBA)
ST-1 – On South Front Street, ~100 feet from the center of Sycamore Avenue. Dominant noise source during noise measurement was vehicular traffic along Sycamore Avenue.	58	53	49	46	50
ST-2 – Southeast corner of Sycamore Avenue and Promenade Street. Dominant noise source during noise measurement was vehicular traffic along Sycamore Avenue.	67	60	43	36	55
ST-3 – At the intersection of Bayfront Boulevard and Earnest Street. ~330 feet from the railroad Tracks. Primary noise sources during measurement were vehicular traffic along Bayfront Boulevard and Earnest Street.	63	53	44	38	50
ST-4 – At the intersection of Sanderling Drive and Sanderling Drive. Dominant noise sources during noise measurement were vehicular traffic and a motorcycle.	61	52	41	38	51
ST-5 – Park across from Martinez Amtrak Station, ~ 540 feet south of railroad Tracks. Primary noise sources during noise measurement were bus traffic, train pass-bys, and train warning whistles. ⁸	76	63	52	46	63
ST-6 – Same location as LT-4. Same sources of noise as ST-5.	86	66	49	44	72

Short-term noise measurements ST-5 and ST-6 were made to document the noise sources in the vicinity of the station. Noise measurement location ST-5 was made for a period of one hour beginning at 1:30 p.m. on January 28, 2009, at a distance of about 540 feet south of the railroad tracks and about 5 feet above the ground. The dominant source of noise at this location during the measurement was bus traffic and intermittent train whistles. Noise measurement ST-6 was made for a period of 1 hour starting at 1:27 p.m. on January 28, 2009, at a distance of about 140 feet from the railroad tracks. The primary noise sources at this location were bus traffic in the station, train pass-bys, and intermittent train whistles. Table 4.8-6 shows a summary of the noise data acquired at these sites.

Maximum noise level at LT-4 was measured as high as 105 dBA as a result of train warning whistles. During the 1-hour observation on January 28, 2009, instantaneous maximum noise levels measured at 140 feet from the railroad tracks were about 76 dBA as a result of train whistles while waiting at the station, and about 68 dBA during train pass-bys. The intermodal station proposed in Hercules, California would not have an at-grade railroad crossing, but trains would be expected to sound their horns as they approach the station, particularly through trains such as freights.

^{8 8} The site near the Martinez Amtrak Station was selected because operational noise levels near the Hercules ITC are expected to be similar, although substantial design differences prevent direct comparisons.

3.9 Biological Resources

This section outlines the regulatory setting for the Hercules ITC project with respect to biological resources; describes the general environmental setting in which the project is located; describes the biological habitats present within the Environmental Study Limit (ESL; areas within and adjacent to the project site); and describes biological resources that may be affected by implementation of the proposed project, including species granted special management considerations by state, federal, and local regulations (commonly referred to as “special-status”) as well as habitats and species of regional importance such as commercially and/or recreationally important fisheries.

Previous Biological Studies

Several biological studies, including habitat evaluation technical memorandums and presence/absence survey reports, have been prepared in support of the proposed project and earlier versions of the proposed project. Previous biological studies for the Hercules ITC were prepared between December 2003 and April 2008 by Vollmar, WWR, WWA, and Condor Country Consulting under contract with the City. Previously prepared biological documents that were used in the development of this biological resources section are listed and described in Appendix G.

3.9.1 Regulatory Framework

3.9.1.1 Federal

Federal Endangered Species Act

The United States Fish and Wildlife Service (USFWS) and the National Oceanographic and Atmospheric Administration’s National Marine Fisheries Service (NMFS) enforce the provisions stipulated within the Federal Endangered Species Act of 1973 (hereafter, “FESA,” 16 USC Section 1531 et seq.). Threatened and endangered species on the Federal list (50 CFR Section 17.11, and 17.12) are protected from take, defined as direct or indirect harm, unless a Section 10 permit is granted to an entity other than a federal agency or a Biological Opinion with incidental take provisions is rendered to a federal lead agency via a Section 7 consultation. Pursuant to the requirements of FESA, an agency reviewing a proposed project within its jurisdiction must determine whether any federally listed species may be present in the study area and determine whether the proposed project will have a potentially significant impact upon such species. Under FESA, habitat loss is considered to be an impact to a species. In addition, the agency is required to determine whether the project is likely to jeopardize the continued existence of any species that is proposed for listing under FESA or to result in the destruction or adverse modification of critical habitat proposed to be designated for such species (16 USC 1536[3], [4]). Therefore, project related impacts to these species or their habitats would require mitigation. Other federal agencies (i.e., U.S. Forest Service, Bureau of Land Management) designate species of concern (species that have the potential to become listed), which are evaluated during environmental review although they are not otherwise protected under FESA.

Project-related impacts to such species would also be considered a significant impact and may require mitigation.

Federal Clean Water Act

Any person, firm, or agency planning to alter or work in “waters of the U.S.,” including the discharge of dredged or fill material, must first obtain authorization from the USACE under Section 404 of the CWA (CWA; 33 USC 1344).

Waters of the U.S. are defined as: all waters used in interstate or foreign commerce; all interstate waters including interstate wetlands; all other waters such as intrastate lakes, rivers, streams (including intermittent and ephemeral streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes or natural ponds, where the use, degradation, or destruction of which could affect interstate commerce; impoundments of these waters; tributaries of these waters; or wetlands adjacent to these waters (33 CFR Part 328). With non-tidal waters, in the absence of adjacent wetlands, the extent of USACE jurisdiction extends to the ordinary high water mark (OHWM) – the line on the shore established by fluctuations of water and indicated by a clear, natural line impressed on the bank, shelving, changes in soil character, destruction of terrestrial vegetation, or the presence of litter and debris. Wetlands are defined as:

“...those areas that are inundated or saturated by surface or ground water at a frequency and duration to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.”

Section 404 requires project proponents to obtain a permit from ACOE for all discharges of dredged or fill material into waters of the U.S., including oceans, bays, rivers, streams, lakes, ponds, and wetlands, before proceeding with a proposed activity. ACOE may issue either an individual permit evaluated on a case-by-case basis or a general permit evaluated at a program level for a series of related activities. General permits are preauthorized and are issued to cover multiple instances of similar activities expected to cause only minimal adverse environmental effects. Nationwide Permits (NWP) are a type of general permit issued to cover particular activities. Each NWP specifies conditions that must be met in order for the NWP to apply to a particular project. Compliance with Section 404 requires compliance with several other environmental laws and regulations, including NEPA, the ESA, and the National Historic Preservation Act (NHPA) (see Section 4.4, Cultural and Historic Resources).

Section 404 permits may be issued only if there is no practicable alternative to the proposed discharge that would have less of an adverse effect on the aquatic ecosystem and has no other adverse environmental consequences. In addition, USACE cannot issue or verify any permit until a state water quality certification, or waiver of certification, has been issued by the RWQCB pursuant to Section 401. Section 401 requires that every applicant for a federal permit or license for an activity that may result in a discharge into waters of the U.S. obtain certification that the activity will comply with state water quality standards.

Rivers and Harbors Act

Section 10 of the Rivers and Harbors Act of 1899 prohibits the obstruction or alteration of navigable waters of the U.S. without a permit from USACE (33 USC 403). The Rivers and Harbors Act (RHA) of 1899 prohibits the unauthorized alteration or obstruction of any navigable waters of the United States. As defined by the RHA, navigable waters include all waters that are:

- ◆ Historically, presently, or potentially used for interstate or foreign commerce; and
- ◆ Subject to the ebb and flow of tides.

Administered by the USACE, the RHA specifically regulates:

- ◆ Construction of structures in, under, or over navigable waters;
- ◆ Deposition or excavation of material in navigable waters; and
- ◆ All work affecting the location, condition, course, or capacity of navigable waters.

Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) of 1972 requires that federal actions be consistent with state coastal plans. The San Francisco BCDC Bay Plan is approved under the CZMA. To implement this provision, federal agencies make “consistency determinations” on their proposed activities and applicants for federal permits, licenses, other authorization or federal financial assistance make “consistency certifications”. BCDC then has the opportunity to review the consistency determinations and certifications and to either concur with them or object to them.

Executive Order 11990: Protection of Wetlands

Executive Order 11990, signed May 24, 1997, directs federal agencies to refrain from assisting in or giving financial support to projects that encroach on publicly or privately owned wetlands. It further requires that federal agencies support a policy to minimize the destruction, loss, or degradation of wetlands. A project that encroaches on wetlands may not be undertaken unless the agency has determined that (1) there are no practicable alternatives to construction, (2) the project includes all practicable measures to minimize harm to wetlands affected, and (3) the impact will be minor.

Executive Order 13186: Migratory Bird Treaty Act

Under the Migratory Bird Treaty Act of 1918 (16 USC Subsection 703-712), migratory bird species and their nests and eggs are protected from injury or death; these species are listed on the federal list (50 CFR Section 10.13). Project related disturbances must be reduced or eliminated during the nesting cycle.

Bald and Golden Eagle Protection Act

When first enacted in 1940, the Bald and Golden Eagle Protection Act prohibited the take, transport, or sale of bald eagles, their eggs or any part of an eagle except where expressly allowed by the Secretary of the Interior. The Bald and Golden Eagle Protection Act was amended in 1962 to extend the prohibitions to the golden eagle as well.

Executive Order 13112: Invasive Species Prevention

On Feb 3, 1999, Executive Order 13112 was signed establishing the National Invasive Species Council. Executive Order 13112 required that each Federal agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law, (1) identify such actions; (2) subject to the availability of appropriations, and within Administration budgetary limits, use relevant programs and authorities to: (i) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; (iii) monitor invasive species populations accurately and reliably; (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded; (v) conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species; and (vi) promote public education on invasive species and the means to address them; and (3) not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the U.S. or elsewhere unless, pursuant to guidelines that it has prescribed, the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions. In addition, it requires that Federal agencies shall pursue the duties set forth in this section in consultation with the Invasive Species Council, consistent with the Invasive Species Management Plan and in cooperation with stakeholders, as appropriate, and, as approved by the Department of State, when Federal agencies are working with international organizations and foreign nations.

Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) establishes a management system for national marine and estuarine fishery resources. This legislation requires that all federal agencies consult with NMFS regarding all actions or proposed actions permitted, funded, or undertaken that may adversely affect “essential fish habitat (EFH).” EFH is defined as “waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” The Magnuson-Stevens Act states that migratory routes to and from anadromous fish spawning grounds are considered EFH. The phrase “adversely affect” refers to the creation of any impact that reduces the quality or quantity of EFH. Federal activities that occur outside of EFH, but which may have an impact on EFH must be considered in the consultation process. The Magnuson-Stevens Act applies to Pacific salmon, groundfish, and several pelagic species found in the Pacific.

Marine Mammal Protection Act

The Marine Mammal Protection Act (MMPA) (16 USC 1361-1421h), adopted in 1972, makes it unlawful to take or import any marine mammals and/or their products. Under Section 101(a)(5)(D) of this act, an incidental harassment permit may be issued for activities other than commercial fishing that may impact small numbers of marine mammals. An incidental harassment permit covers activities that extend for periods of not more than 1 year and that will have a negligible impact on the impacted species. Amendments to this act in 1994 statutorily defined two levels of harassment: (1) level A harassment is defined as any act of pursuit, torment, or annoyance that has the potential to injure a marine mammal in the wild; and (2) level B harassment is defined as harassment having potential to disturb marine mammals by causing disruption of behavioral patterns including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering.

Estuary Protection Act

The Estuary Protection Act (16 USC 1221-1226), adopted in 1968, outlines the value of estuaries and the need to conserve their natural resources. This act authorizes the Secretary of the Interior, in cooperation with other Federal agencies and the States, to study and inventory estuaries in the U.S. and to determine whether such areas should be acquired by the Federal Government for protection. This statute also authorizes the Secretary of the Interior to enter into cost-sharing agreements with the States for permanent management of estuarine areas. Federal agencies are required to assess the impacts of commercial and industrial developments on estuaries and the Secretary of the Interior is required to establish conditions to ensure the permanent protection of estuaries.

3.9.1.2 State

California Endangered Species Act

The California Endangered Species Act (CESA) of 1970 (CDFG Code Section 2050 et seq., and CCR Title 14, Subsection 670.2, 670.51) prohibits the take (interpreted to mean the direct pursue, catch, capture, or killing of a species) of species listed under CESA (14 CCR Subsection 670.2, 670.5). Under CESA, State agencies are required to consult with the California Department of Fish and Game (CDFG) when preparing CEQA documents. Consultation ensures that proposed projects or actions do not have a negative effect on state-listed species. During consultation, CDFG determines whether take would occur and identifies “reasonable and prudent alternatives” for the project and conservation of special-status species. CDFG can authorize take of a state-listed species if an incidental take permit is issued by the Secretary of the Interior or Commerce in compliance with FESA, or if the director of CDFG issues a permit under Section 2080 in those cases where it is demonstrated that the impacts are minimized and mitigated. A CESA permit must be obtained if a project will result in the take of listed species, either during construction or over the life of the project. Under CESA, CDFG is responsible for maintaining a list of threatened and endangered species designated under state law (CDFG Code 2070). CDFG also maintains lists of species of special concern, which serve

as “watch lists.” Pursuant to the requirements of CESA, a state or local agency reviewing a proposed project within its jurisdiction must determine whether any state-listed species may be present in the project area and determine whether the proposed project will have a potentially significant impact upon such species. Project related impacts to species on the CESA list would be considered significant and would require mitigation. Impacts to species of concern would be considered significant under certain circumstances. Certain species have been designated as “fully protected” under Sections 3511 and 4700 of the fish and Game Code. By law, DFG cannot issue permits or licenses, including CESA incidental take permits, for take or fully protected species. DFG may only authorize the taking of such species for necessary scientific research.

California Native Plant Protection Act

The California Native Plant Protection Act of 1977 (CDFG Code Section 1900-1913) requires all state agencies to use their authority to carry out programs to conserve endangered and otherwise rare species of native plants. Provisions of the act prohibit the taking of listed plants from the wild and require the project proponent to notify CDFG at least 10 days in advance of any change in land use, which allows CDFG to salvage listed plants that would otherwise be destroyed. Candidate species are also protected from taking under the California Native Plant Protection Act.

California Fish and Game Code, The official listing of endangered and threatened animals and plants is contained in the California Code of Regulations (CCR), Title 14, Section 670.5. A state candidate species is one that the California Fish and Game Commission (CFGC) has formally noticed as being under review by CDFG for addition to the state list pursuant to Sections 2074.2 and 2075.5 of the CFGC.

Legal protection is also provided for wildlife species in California that are identified as "fully protected animals". These species are protected under Sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), and 5515 (fish) of the CFGC. Protection is afforded to these animals under the code to the extent that such “animals, or parts thereof, may not be taken or possessed at any time and no provision of this code or any other law shall be construed to authorize the issuance of permits or licenses to take any fully protected animal and no such permits or licenses heretofore issued shall have any force or effect for any such purpose...”

California Fish and Game Code Subsections 3503, 3503.5, and 3800 prohibit the possession, incidental take, or needless destruction of birds, their nests, and eggs. California Fish and Game Code Section 3511 lists birds that are “fully protected”: those that may not be taken or possessed except under specific permit.

Under Sections 1600-1616 of the Fish and Game Code, agencies are required to notify CDFG prior to any project that would divert, obstruct or change the natural flow, bed, channel, or bank of any river, stream, or lake. Preliminary notification and project review generally occur during the environmental process. When an existing fish or wildlife resource may be substantially adversely affected, DFG is required to propose reasonable project changes to protect the

resource. These modifications are formalized in a Streambed Alteration Agreement (Section 1600) that becomes part of the plans, specifications and bid documents for the project.

Porter-Cologne Act Water Quality Control Act

The California Porter-Cologne Act Water Quality Control Act (Porter-Cologne) act regulates all discharges and water quality affecting “Waters of the State.” The term “Waters of the State” is defined by the Porter-Cologne as “any surface water or groundwater, including saline waters, within the boundaries of the state.” The Regional Water Quality Control Board (RWQCB) protects all waters in its regulatory scope, but has special responsibility for wetlands, riparian areas, and headwaters. RWQCB jurisdiction includes “isolated” wetlands and waters that may not be regulated by the USACE under Section 404. “Waters of the State” are regulated by the RWQCB under the State Water Quality Certification Program, which regulates discharges of fill and dredged material under Section 401 of the CWA and Porter-Cologne. Projects that require an USACE permit, or fall under other federal jurisdiction, and have the potential to impact “Waters of the State,” are required to comply with the terms of the Water Quality Certification determination. If a proposed project does not require a federal permit, but does involve dredge or fill activities that may result in a discharge to “Waters of the State,” the RWQCB has the option to regulate the dredge and fill activities under its state authority in the form of Waste Discharge Requirements or Certification of Waste Discharge Requirements.

McAteer-Petris Act (California Government Code 66600-66682)

The McAteer-Petris Act created the San Francisco BCDC in 1965. BCDC’s mission is the protection and enhancement of the San Francisco Bay and the encouragement of responsible use. BCDC’s first task was compilation of a comprehensive study of the Bay and determining how future development of the Bay should occur. This effort resulted in the San Francisco Bay Plan in 1968. In 1969 the findings and policies of the Bay Plan were incorporated into the McAteer-Petris Act which was amended to make BCDC a permanent state agency. The Bay Plan continues to evolve and remains the guiding document for BCDC’s actions.

Section 66610 of the McAteer-Petris Act establishes the boundaries of San Francisco Bay in relation to BCDC’s jurisdiction. Essentially, all areas below the mean high tide line and an area within a shoreline band that extends landward for 100 feet from the mean high tide line are subject to their jurisdiction. Section 66632 of the McAteer-Petris Act establishes the permitting process for projects which would place fill in, on, or over any part of BCDC’s jurisdiction as defined in Section 66610.

Portions of the project that would be in the water or within the shoreline band are subject to BCDC’s jurisdiction.

3.9.1.3 Local Policies, Programs and Plans

City of Hercules General Plan

The General Plan provides open space and conservation objectives and policies in order to protect natural resources and their uses within the City. The objective of the conservation element of the General Plan is for the conservation, development, and utilization of natural resources, including water and its hydraulic force, forests, soils, rivers and other waters, harbors, fisheries, wildlife, minerals, and other natural resources.

Land Use Element

- ◆ Require a minimum 50-foot setback between development and the “top of bank” of the lower Refugio Creek and Rodeo Creek corridors, except that the setback may be reduced for the west branch of Refugio Creek, if the 50-foot setback proves infeasible. This buffer will be included as part of any enhancements required by regulatory agencies or proposed by the developer. Riparian areas which are culverted or underground will be excluded from the buffer requirement. (Program 14A.4)

Open Space/Conservation Element

Policy 3a: Design of building footprints along any riparian corridors shall be outside the CDFG- and/or USACE-pre-approved buffer zone. Sensitive riparian habitats shall be marked by a qualified biologist to deter any destruction by equipment during construction.

Program 3a-1: Prior to construction in areas of riparian corridors or wetlands, the City shall support CDFG and USACE permitting process. A Streambed Alteration Agreement from CDFG and/or a Section 404 USACE permit shall be obtained by the project applicant prior to any development within any creek or discharge of fill into any creek.

Program 3a-2: Development along any riparian corridor shall incorporate measures to avoid impacts during construction, including:

1. Construction of any access bridge shall be limited to the bridge footprint area only.
2. Parking of large equipment shall be on the upland grassland area or on the paved street. Construction workers cars shall have designated parking areas.
3. Basins for oil leaks from the equipment shall be installed if equipment is parked onsite over night.

Policy 4a: The City shall require project proponents to design facilities to prevent degradation of riparian and wetland communities from urban pollutants in storm runoff.

Program 4a-1: To minimize pollution downstream from sedimentation, the City shall require installation of sedimentation and grease basins in the storm drain system in parking lots in accordance with NPDES regulations and shall require that property owners maintain the basins

annually, or as required by NPDES regulations. Parking lots shall be swept periodically to decrease the amount of debris that could potentially contaminate the riparian or wetland habitat.

Policy 5a: The City shall review development proposals for consistency with minimizing impacts to salt marsh zones. Buildings shall be located on existing developed or graded areas, where practicable.

Policy 5b: The City shall work with CDFG, BCDC, East Bay Regional Park District, and the USACE to determine appropriate buffer zones along the Bay to protect tidal habitat when designing a bay access trail linkage between Pinole and Rodeo. Public access and pedestrian pathways shall be limited within the buffer zone, and when possible, located along the edges of the buffer zone. Bicycles shall be encouraged to stay on bike paths through the use of signage and fencing.

Policy 6a: The City shall continue to utilize environmental review under CEQA to review development projects that are not exempt from the CEQA for impacts on sensitive species and their habitat.

Policy 6b: The City shall require that development within the General Plan area incorporates features to preserve habitat for sensitive species.

Program 6b.1: Areas that could provide habitat for sensitive species shall be surveyed by qualified biologists provided by project sponsors prior to project design. Surveys in sensitive areas shall be conducted prior to any development. Sensitive areas within the study area includes eucalyptus groves, freshwater wetlands, and adjacent trees, open grasslands, ponds and creeks, and buildings which are abandoned or slated for destruction. If any species is present, coordination with the CDFG will be required for mitigation of impacts and redesigning of the project footprint to avoid any sensitive species or sensitive habitat. If avoidance is unavailable, coordination with the CDFG will be required for relocation of these species and for determining replacement of habitat.

Policy 6c: As much open space as possible within sites proposed for development shall be retained as information open space for wildlife habitat, rather than as formal, landscaped parks or grounds.

The City shall require that native plants from the local area be used in landscaping, and in areas with a lower water table, native drought tolerant species shall be used in landscaping.

Program 6c.1: Development, subdivision and planned development plan applications shall be reviewed and conditioned to implement the following: i) Wildlife areas shall be revegetated with native or non-native grassland and native species of shrubs requiring no irrigation and little management beyond the first year after planting; ii) Wildlife habitat shall be consolidated into “preserves” that are as large as possible; iii) Habitats on adjoining parcels shall be as contiguous as possible, to create wildlife corridors; iv) Wildlife open space shall be placed adjacent to other wildlife habitat, to preserve the greatest ecological value; v) Public access to wildlife habitat shall be minimized by placing trails close to buildings so as to provide the

largest area of habitat possible with the least amount of impact from the public; vi) Open space areas shall be designed into the footprint of proposed projects and shall be located adjacent to existing open space areas, providing a larger continuous area for wildlife to use; vii) Open space areas, if disturbed during construction, shall be landscaped with native species; viii) Trails, if any, shall be placed close to buildings so as not to disturb wildlife nesting/denning areas.

Program 14A.3: Continue to improve and protect Refugio Creek as a major environmental amenity.

Program 14A.4: Require a minimum 50 foot setback between development and the “top of bank” of the lower Refugio Creek and Rodeo Creek corridors, except that the setback may be reduced for the west branch of Refugio Creek, if the 50 foot setback proves infeasible. This buffer will be included as part of any enhancements required by regulatory agencies or proposed by the developer. Riparian areas which are culverted or underground will be excluded from the buffer requirement.

Hercules Tree Removal Ordinance

The City’s ‘tree ordinance,’ i.e., the adopted City ordinance regarding “Removal of Mature Trees” (Ordinance No. 1331), serves to prohibit the removal of trees on undeveloped land except when permitted as part of a development application. The ordinance was adopted to prevent the uncontrolled removal or destruction of mature trees on undeveloped or partially developed land in the City. Trees with trunk diameters of 12-inches or greater are protected under the provisions of the ordinance, which prohibits their removal except as allowed under emergency situations or approved as part of a development project. A tree replacement plan is required under the ordinance as a condition of approval when tree removal is unavoidable.

San Pablo Bay Watershed Restoration Program

The San Pablo Bay Watershed Restoration Program (SPBWRP) was developed by the USACE, the Coastal Conservancy, and The Bay Institute over a period of about two years. The SPBWRP provides technical and financial assistance to individuals, organizations and government agencies who undertake ecological restoration projects within the San Pablo Bay watershed. The purpose of the SPBWRP is to promote revitalization of the watershed’s wetlands, rivers, lakes and streams, and to improve the health of San Pablo Bay itself. The SPBWRP was established in response to the growing awareness that the ecological integrity of the watershed is essential to the long-term health of both human and wildlife communities (Coastal Conservancy and USACE 2000).

3.9.2 Existing Conditions

The project site is located mostly in the Refugio Creek watershed, a small portion of Pinole Creek to the southern end of the project site, and a small unnamed drainage near the Victoria by the Bay development. The Refugio Creek Watershed is one of a series of roughly parallel, northwest trending valleys and ridges in west Contra Costa County. The upper watershed is

bordered by large, open space areas including the Muir Heritage Land Trust's Fernandez Ranch, East Bay Municipal Utility District's watershed lands, and open space owned by local homeowners associations. The lower watershed is bordered by San Pablo Bay. Prevalent habitats in the watershed include ruderal, eucalyptus, mixed oak/bay woodland, annual grassland, mixed riparian forest, and freshwater marsh (City of Hercules 2009c).

The ESL consists primarily of UPRR ROW, which parallels the shore of San Pablo Bay, privately owned bay front parcels planned for future commercial development, and a segment of Refugio Creek that flows through the ESL and empties into San Pablo Bay via culverts underneath the railroad tracks. The elevation in the ESL trends from sea level on the north to approximately 12 feet above mean sea level (amsl) near the railroad embankment, and up to 40 feet amsl closer to Bayfront Boulevard. Several protected areas that are managed by local, state and federal agencies for natural resources are located within San Pablo Bay and in the general project region (southwest of the ESL), including San Pablo Bay Regional Park, Pinole Shores Regional Park, and Point Pinole Regional Shoreline. The Historic Town Center is located south of the ESL.

The UPRR ROW runs along the shoreline of San Pablo Bay and is 100 feet wide with two main tracks approximately 13 to 14 feet apart; the tracks are elevated slightly above the sub-grade. At the west end there is an additional track (house track) located on the water side. Along the tracks, there are signals, utilities and pipelines, including a high-pressure fuel pipeline, fiber-optic and telephone cables, and electrical lines located along the southeast side of the ROW. The ROW ranges in elevation from near sea level to approximately 20 feet above msl near the northern limit of the ESL.

The privately owned undeveloped parcels are located between Bayfront Boulevard and the UPRR ROW and are situated at an elevation ranging from six to ten feet amsl. They are partially covered with vegetation consisting mainly of weeds and non-native grasses, and do not presently contain any structures. The area has been heavily surcharged with compacted, engineered dirt fill placed during grading for the adjacent residential development.

Refugio Creek is a channelized stream and a low-flow tributary of San Pablo Bay that traverses the UPRR ROW east of Hercules Point. The creek passes beneath the UPRR tracks through a culvert with three pipes that are approximately eight feet in diameter prior to discharging into San Pablo Bay. The Refugio Creek channel is about 30 feet wide (measured from the tops of the banks) in the ESL. A pedestrian bridge crosses the creek channel approximately 300 feet southeast of the project site. The closest existing road access points across the creek are at Tsushima Drive, approximately 0.4 mile southeast of the ESL, and at Sycamore Avenue and San Pablo Avenue, approximately 0.75 mile southeast of the ESL.

The segment of Refugio Creek channel from the proposed project's southern (upstream) boundary northward (downstream) to immediately north of the proposed Bayfront Bridge includes approximately more than 1,200 linear feet of tidal channel. As a result of historic filling, the creek banks have very steep to vertical profiles. The creek banks within the ESL range in height from 8 to 14 feet from creek bed to top-of-bank. Part of the lower creek area is

within the 100-year flood zone identified by the Federal Emergency Management Agency (FEMA) FIRM revised July 21, 2005. In the study segment of the creek, the existing low-flow creek channel varies in width (top-of-bank to top-of-bank) from approximately 20 feet in the upstream portion to about 40 feet in the downstream portion. At the downstream end (beyond the project boundary), the creek flows through culverts under a service road and then under a railroad bridge to San Pablo Bay. A non-tidal tributary, referred to as the North Channel, enters the main creek channel from the northeast near the southern (upstream) project boundary. An additional non-tidal tributary (referred to as the Central Channel) enters the main creek channel from the south approximately in the middle of the main channel length on the ESL.

3.9.2.1 Habitat Types/Vegetation Communities

This section discusses the habitat types found within the ESL. Habitat types or vegetation communities are assemblages of plant species that typically coexist in the same area. Vegetation communities are classified based upon the life form of the dominant species within that community and their associated flora. Where possible, habitat nomenclature follows the CDFG Vegetation Classification and Mapping Program. A habitat map of is included as Figure 3.9-1.

3.9.2.1a Terrestrial Habitat Types

Four types of terrestrial habitat types occur within the ESL: ruderal, railroad, riprap, and willow riparian forest. The majority of the ESL is ruderal, both on Hercules Point and inland of the railroad tracks. The railroad bisects the ESL and is unvegetated. Riprap includes areas where the coastline has been stabilized with rip-rap or rubble, and spans most of the ESL's shoreline. Willow riparian forest occurs in three patches on the ESL.

Ruderal

The vast majority of the ESL has been altered by development. Adjacent to the project are the former site of a dynamite factory and the current sites of residential and commercial developments. The ESL is traversed by an active railroad. A portion of the ESL is currently being prepared for development, with large stockpiles of dirt in place to compact the ground. The stockpiles are unvegetated and of little value to wildlife. The areas that are not currently developed, but have been altered or disturbed by development, are ruderal. The vegetated portion of the ruderal habitat in the ESL is dominated primarily by non-native grasses and forbs. Ruderal habitat occupies 89.99 acres of the ESL.

Dominant plant species include non-native grasses, such as ripgut brome, Italian ryegrass (*Lolium multiflorum*), and wild oats (*Avena fatua*, *A. barbata*), and non-native forbs, such as bristly ox-tongue (*Picris echioides*), black mustard (*Brassica nigra*), wild radish (*Raphanus sativus*), redstem filaree (*Erodium cicutarium*), cutleaf geranium (*Geranium dissectum*), hairy vetch (*Vicia villosa*), poison hemlock (*Conium maculatum*), and rose clover (*Trifolium hirtum*). Coyote brush (*Baccharis pilularis*), a native shrub often found in disturbed areas, is scattered in the ruderal habitat. Also scattered throughout the ruderal habitat are cultivated

varieties of trees, such as blue gum eucalyptus (*Eucalyptus globulus*), blackwood acacia (*Acacia melanoxylon*), black walnut (*Juglans californica*), and palm trees.

The western portion of the ruderal habitat has been highly disturbed by stockpiling of dirt, previous road and trail-building, on-going railroad operation, and on- and off-trail foot traffic. Vegetation in this part of the project site is low-growing and, on the stockpiles, non-existent. This part of the project site provides limited value to wildlife.

The eastern portion of the project site follows a slope that connects a bluff to the San Pablo Bay coastline. A strip of ruderal habitat, less than 200 feet wide, follows the slope. Vegetation is not frequently disturbed in this strip; however, on-going railroad operation provides frequent disturbance to wildlife. The eastern portion of the ruderal habitat provides limited value to wildlife.

A portion of ruderal habitat flanks Refugio Creek and its associated wetlands. The ruderal habitat surrounding Refugio Creek is in part dominated by horticultural plantings, and in part dominated by nonnative annual grasses and forbs with scattered shrubs. During a November 2009 site visit by HDR biologists, raccoon (*Procyon lotor*) and black-tailed deer (*Odocoileus hemionus*) tracks were seen in this area. It provides a small area of foraging habitat for raccoon, black-tailed deer, and other disturbance-adapted wildlife such as domestic cat (*Felis catus*), white-crowned sparrow (*Zonotrichia leucophrys*), house finch (*Carpodacus mexicanus*), and European starling (*Sturnus vulgaris*).

Railroad

An active UPRR railroad crosses the ESL immediately adjacent to the San Pablo Bay shore. The railroad ROW consists of ballast rock and highly compacted dirt, and is mostly unvegetated. A number of seasonal puddles occur within the railroad ROW. The puddles are described below as Unvegetated Pondered Depressions. Due to the heavy activity and highly disturbed condition of the railroad ROW, the area provides limited habitat value for wildlife. Railroad occupies 11.91 acres of the ESL.

Riprap

Where the railroad ROW passes immediately adjacent to the San Pablo Bay shore, a riprap revetment is in place to stabilize the shore. Additionally, cement and other rubble, presumably from the Hercules powder plant, line much of the shore of Hercules Point. The lower elevation riprap may provide habitat for marine invertebrates. While marine mammals such as harbor seal (*Phoca vitulina*) and California sea lion (*Zalophus californianus*) haul out on rocky shorelines, they most commonly do so in areas that are separated from human activity. No haul-out sites are known in the area. It is very unlikely that marine mammals would make use of the riprap. Riprap occupies 4.678 acres of the ESL.



- Legend**
- Project Boundary
 - Track Option B
 - Temporary Area of Disturbance (Development not Part of This Project)
 - Environmental Study Limit
 - Freshwater Intermittent Drainage (0.08 Acres)
 - Pickleweed Brackish Marsh (9.05 Acres)
 - Brackish Stream (0.68 Acres)
 - Freshwater Wetland Swale (0.41 Acres)
 - Seasonal Wetland (2.09 Acres)
 - Cattail Marsh (3.59 Acres)
 - Unvegetated Pondered Depression (0.40 Acres) (not subject to 404 or Porter Cologne)*
 - California Cordgrass Tidal Marsh (4.05 Acres)
 - Intertidal Mudflats (96.46 Acres)
 - Pickleweed Tidal Marsh (2.86 Acres)
 - Willow Riparian Forest (1.27 Acres)
 - Ruderal (89.99 Acres)
 - Riprap (4.68 Acres)
 - Railroad (11.91 Acres)
 - Unvegetated Shoreline (0.72 Acres)
 - Open Water (0.10 Acres)

* These Unvegetated Pondered Depressions do not meet the USACE three-parameter test to qualify as wetlands and are not considered jurisdictional.

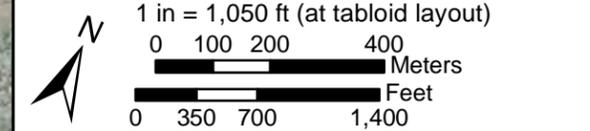


Figure 3.9-1: Habitat Map

City of Hercules
 Hercules Intermodal Transit Facility
 Contra Costa County, California

Data Sources: Map information was compiled from the best available sources. No Warranty is made for its accuracy or completeness. Topographic Base Map, Aerial photography from ESRI ArcGIS Online; Hydrography from National Hydrography Dataset; NWI Data from U.S. Fish and Wildlife Service and soils data from USDA NRCS Soil Survey. Data is State Plane Feet, NAD83 Zone 3



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Willow Riparian Forest

Three patches of habitats with willow riparian forest characteristics occur in the ESL: one within the railroad ROW, one in the northeastern extent of the ESL, and one on the Northern Channel of Refugio Creek. All patches are linear features. They are isolated patches and not part of a larger forest. The dominant trees in the patches are red willow (*Salix laevigata*) and arroyo willow (*Salix lasiolepis*). These areas contain brackish marsh or freshwater wetland swale features with willow riparian forest characteristics. The willow riparian forest provides habitat for numerous animal species, such as those found along Refugio Creek. Willow riparian forest occupies 1.265 acres of the ESL.

3.9.2.1b Aquatic Habitat Types

Aquatic habitat types/vegetation communities in the ESL include California cordgrass tidal marsh, pickleweed tidal marsh, intertidal mudflat, pickleweed brackish marsh, brackish stream including Refugio Creek, cattail marsh, seasonal wetland, freshwater wetland swale, freshwater intermittent drainage, and unvegetated ponded depression. Freshwater seasonal wetlands and unvegetated ponded depressions occur within the railroad ROW and other ruderal habitats. The California cordgrass tidal marsh and pickleweed tidal marsh are located on the perimeter of Hercules Point, with California cordgrass tidal marsh at slightly lower elevation than pickleweed tidal marsh. The California cordgrass tidal marsh and pickleweed tidal marsh together form northern coastal salt marsh, a Natural Community of Special Concern. The intertidal mudflat occurs along the San Pablo Bay shoreline on the waterside of the railroad tracks. Refugio Creek is a perennial stream with some adjacent wetlands. Cattail marshes and freshwater intermittent drainages occur adjacent to Refugio Creek, within willow riparian forest habitats, and along the eastern side of the site.

California Cordgrass Tidal Marsh

California cordgrass tidal marsh grows patchily along the perimeter of Hercules Point. As is typical, it is the habitat type growing closest to the open water of the San Pablo Bay. California cordgrass (*Spartina foliosa*) dominates the habitat type, growing in dense homogenous stands. Based on size and structure, all of the cordgrass at the ESL appears to be the native California cordgrass and not among the invasive species of cordgrass. California cordgrass tidal marsh provides habitat for relatively few species; however, it does provide important habitat for the Federal and state listed California clapper rail (*Rallus longirostris obsoletus*). California cordgrass tidal marsh occupies 4.054 acres of the ESL.

Pickleweed Tidal Marsh

Pickleweed tidal marsh grows patchily along the perimeter of Hercules Point, in the mid-tidal zone. It grows immediately inland of California cordgrass tidal marsh. Pickleweed dominates the pickleweed tidal marsh. Several other plants are patchily dominant, along with pickleweed. These plants include alkali bulrush (*Bolboshoenus maritimus*), fleshy jaumea (*Jaumea carnosa*), saltgrass, and marsh gumplant (*Grindelia stricta* var. *angustifolia*). Pickleweed tidal marsh

provides habitat for several common and special-status species, such as the San Pablo vole (*Microtinus californicus sanpabloensis*), salt-marsh wandering shrew (*Sorex vagrans halicoetes*), the Federal and state listed salt-marsh harvest mouse (*Reithrodontomys raviventris*) and the state listed black rail (*Laterallus jamaicensis*). Pickleweed tidal marsh occupies 2.861 acres of the ESL.

Intertidal Mudflat

Intertidal mudflats occur within the offshore portions of the ESL. These sparsely vegetated intertidal areas occur from approximately mean lower low water (MLLW) to mean tide level (MTL). Intertidal mudflats provide habitat for many species of invertebrates, including diatoms, polychaetes, oligochaetes, amphipods, isopods, and crustaceans. During low tide, mudflats provide foraging and roosting areas used by numerous shorebirds during the spring migration. Shorebirds frequently found on mudflats in the Bay include western sandpiper (*Calidris mauri*), least sandpiper (*Calidris minutilla*), dunlin (*Calidris alpina*), long- and short-billed dowitcher (*Limnodromus griseus* and *L. scolopaceus*, respectively), long-billed curlew (*Numenius americanus*), whimbrel (*Numenius phaeopus*), and American avocet (*Recurvirostra americana*). During high tide, mudflats provide foraging habitat for fish, including longfin smelt (*Spirinchus thaleichthys*), staghorn sculpin (*Leptocottus armatus*), starry flounder, and leopard shark (*Triakis semifasciata*). Intertidal mudflat occupies 96.463 acres of the ESL.

Brackish Stream

The ESL contains Refugio Creek and an unnamed stream to the east; both of which are tidally influenced and contain brackish marsh vegetation. Brackish stream occupies 0.682 acres of the ESL.

Refugio Creek is a tidally influenced perennial stream that flows directly into San Pablo Bay. It was altered in the early 1990s from a natural channel into a straightened, deepened, channeled waterway. At its downstream end, Refugio Creek flows through culverts under a railroad bridge. During high flows, the creek backs up from the culverts. The stream's downstream end is characterized by salt-tolerant plants, such as pickleweed and saltgrass. Its upstream end is characterized by less salt-tolerant plants, such as cattails (*Typha* sp.) and common tule (*Schoenoplectus acutus*).

An unnamed brackish stream flows through the northeastern portion of the ESL. It is tidally influenced and supports brackish vegetation such as pickleweed, saltgrass, and alkali bulrush. A portion of the stream in the ESL is cement-lined. Beyond the ESL, the stream flows under the railroad through a three-foot culvert and into the San Pablo Bay.

Pickleweed Brackish Marsh

Pickleweed brackish marsh habitat occurs adjacent to the brackish stream habitats within the ESL or have hydrology that may be augmented by wicking from adjacent surcharge activity. These marsh habitat types are primarily created during periods of high flow and/or high tide in

their respective creeks. They contain salt-tolerant vegetation, such as pickleweed, saltgrass, or alkali bulrush. Pickleweed brackish marsh occupies 9.054 acres of the ESL.

Cattail Marsh

Several freshwater perennial wetland features occur within the site, primarily in the vicinity of Refugio Creek. Cattail marshes near Refugio Creek are dominated by cattails and generally have little other vegetation. Cattail marsh occupies 3.588 acres of the ESL.

Seasonal Wetland

Several non-tidal freshwater seasonal wetlands occur in shallow depressions throughout upland portions of the ESL. The depressions are located near Refugio Creek and along the eastern portion of the railroad ROW. Many of the depressions are the result of human activities. In shallower depressions, vegetation is dominated by bristly ox-tongue, Italian ryegrass, and curly dock. Deeper depressions, often bounded by soil deposit berms, support more hydrophytic species, such as rabbitsfoot grass (*Polypogon monspeliensis*) and rough cocklebur (*Xanthium strumarium*). Seasonal wetland occupies 2.091 acres of the ESL.

Freshwater Wetland Swale

One freshwater wetland swale occurs within the northeastern portion of the ESL. The swale runs through a patch of willow riparian forest. Vegetation includes willow trees and understory herbaceous vegetation such as tall flatsedge (*Cyperus eragrostis*) and creeping wildrye (*Leymus triticoides*). Freshwater wetland swale occupies 0.408 acres of the ESL.

Freshwater Intermittent Drainage

Four freshwater intermittent drainage features occur within the ESL. One drains into Refugio Creek. Refugio Creek's North Channel flows through the ESL, supporting a willow riparian forest and, in its downstream reach, supporting salt-tolerant plants such as pickleweed, saltgrass, and alkali bulrush. Another is between the willow riparian and brackish stream habitat, and another between the cattail marsh and the same brackish stream on the eastern portion of the ESL. Freshwater Intermittent Drainage occupies 0.078 acres of the ESL.

Unvegetated Poned Depression

Several seasonally ponded depressions, or "puddles", occur within the railroad ROW and adjacent to the railroad ROW. The puddles occur within depressions in compacted dirt and gravel. They are generally devoid of vascular vegetation. The puddles reach a maximum depth of six inches in the winter, with most not exceeding three inches in depth. Puddles in the eastern portion of the ESL were surveyed for federally-listed vernal pool branchiopods by Vollmar Consulting in 2007; and puddles in the west were surveyed by Condor Country Consulting in 2003. The puddles provide habitat for aquatic invertebrates, such as versatile fairy shrimp (*Branchinecta lindahli*), daphnia (Cladocera), seed shrimp (Ostracoda), water boatmen (Corixidae), midge larvae (Chironomidae), and mosquito larvae (Culicidae). The

puddles provide poor habitat for vertebrates and listed invertebrates. To date, few vertebrates and no federally-listed vernal pool branchiopods have been found. Unvegetated ponded depression occupies 0.401 acres of the ESL.

Open Water

The Open Waters are defined as the permanently submerged portions of San Pablo Bay. These dynamic mixing areas are influenced by the inflow of saline ocean water entering via the Golden Gate on twice-daily flood tides, and the outflow of freshwater from the Delta through the Carquinez Strait (WWR 2007a). A large, natural central channel divides the open water habitat. Depths in this main channel often exceed 50 feet, with the majority of the outlying shoal regions less than 10 feet deep. Open waters are the predominant aquatic habitat in the study area, providing unique biological benefits to an array of aquatic animals (WWR 2007a). Open water occupies 0.098 acres of the ESL.

3.9.3 Sensitive Biological Resources

Sensitive biological resources within the ESL include sensitive natural communities, special-status wildlife and plant species, commercially/recreationally important fisheries, and potential waters of the U.S., including wetlands and other special aquatic sites.

3.9.3.1 Sensitive Natural Communities and Special-Status Species Potentially in the Project Area

Based on the special-status species evaluation described in Section 3.9.2, special-status species and sensitive natural communities that were determined to have the potential to occur in the ESL and/or be impacted by the proposed project are listed in Table 3.9-1, the Project Study Area Sensitive Species/Natural Communities Table. The table includes the scientific name, common name, listing status, and a discussion of presence/absence of the species and its habitat in the ESL. Appendix G includes life history descriptions for special-status species.

Sensitive Natural Communities

Vegetation communities (habitats) are generally considered “sensitive” if: (a) they are considered rare within the region by various agencies including USFWS, CDFG, and other local agencies; (b) if they are known to support sensitive animal or plant species; and/or (c) they are known to serve as important wildlife corridors. Sensitive habitats are typically depleted throughout their known ranges, or are highly localized and/or fragmented. The project site contains four sensitive natural communities as defined under definitions (a) through (c) discussed above: Coastal Brackish Marsh, Northern Coastal Salt Marsh, eelgrass beds, and intertidal mudflat.

Table 3.9-1 Project Study Area Sensitive Species/Natural Communities Table

Scientific Name/ Common Name	Federal/State/ CNPS Status	Habitat Present/ Absent	Likelihood of Occurrence	Rationale
Amphibians				
California red-legged frog Rana draytonii	FT/SSC/--	P	Low	No breeding habitat for CRLF is present in the ESL. Areas adjacent to the southern-end of the project boundary for Track Option B do not provide favorable habitat. However, it is possible that CRLF could disperse into or through these areas from nearby populations. No CRLF have been observed in either location.
Invertebrates				
Vernal pool fairy shrimp Branchinecta lynchi	FT/--/--	P	Low	Marginal habitat is present in the freshwater wetlands on-site. Two complete sets of wet season presence/absence surveys have been conducted. Vernal pool fairy shrimp were not found.
Birds				
Cooper's hawk (nesting) Accipiter cooperi	--/--/G5, S3	P	Medium	Nesting and foraging habitat for this species is present in the ESL and adjacent to the southern-end of the project boundary for Track Option B, but it has not been observed in either location.
Tricolored blackbird Agelaius tricolor	--/SSC/--	P	Low	Suitable nesting habitat occurs adjacent to the ESL and suitable foraging habitat occurs in the ESL. This species has not been observed in the ESL.
Burrowing owl Athene cunicularia	--/SSC/--	P	Low	Marginal wintering habitat occurs in the ESL; however no suitable habitat is present adjacent to the southern-end of project boundary for Track Option B. One burrowing owl was observed on Hercules Point in 2007 but subsequent protocol surveys did not detect any burrowing owls. The burrowing owl sighted in 2007 is presumed to be a random visitor. Burrowing owl is believed to be currently absent from the ESL.
Northern harrier Circus cyaneus	--/SSC/--	P	Low	Suitable nesting habitat occurs adjacent to the ESL and adjacent to the southern-end of the project boundary for Track Option B. Suitable foraging habitat occurs in the ESL. This species has not been observed in the ESL.
White-tailed kite (Nesting) Elanus leucurus	--/SFP/--	P	Low	Marginal nesting habitat occurs in the ESL and foraging habitat is also present. A pair of white-tailed kites was observed on Hercules Point during surveys in 2007, but no nests were observed. This species frequently forages in areas adjacent to the southern-end of the project boundary for Track Option B. White-tailed kite is believed to be currently absent from the ESL.
Saltmarsh common yellowthroat Geothlypis trichas sinuosa	--/SSC/--	P	Low	Suitable nesting habitat for this species occurs in the ESL and adjacent to the southern-end of the project boundary for Track Option B, but it has not been observed in the ESL. Saltmarsh common yellowthroat is believed to be currently absent from the ESL.

Scientific Name/ Common Name	Federal/State/ CNPS Status	Habitat Present/ Absent	Likelihood of Occurrence	Rationale
California black rail <i>Laterallus jamaicensis coturniculus</i>	--/ST, SFP/--	P	Low	Suitable nesting habitat for this species occurs in the ESL and areas adjacent to the southern-end of the project boundary for Track Option B. It has not been observed in the ESL during protocol surveys in 2007. It was documented in the nearby tidal marsh in 2001 (adjacent to the southern-end of the project boundary for Track Option B. California black rail is believed to be absent from the ESL but may occur in adjacent areas.
San Pablo song sparrow <i>Melospiza melodia samuelis</i>	--/SSC/--	P	High	Suitable nesting habitat for this species occurs in the ESL, and seven to nine pairs were been observed in the ESL during protocol surveys in 2007.
Alameda song sparrow <i>Melospiza melodia pusillula</i>	--/SSC/--	P	High	This species has been observed displaying nesting behavior near the southern-end of the project boundary for Track Option B. Suitable nesting habitat is also present within this area.
Osprey <i>Pandion haliaetus</i>	--/SSC/--	P	High	This species is regularly observed foraging near the southern-end of the project boundary for Track Option B and could nest on or near this area.
California clapper rail <i>Rallus longirostris obsoletus</i>	FE/SE/--	P	Low	Marginal nesting habitat for this species occurs in the ESL and areas adjacent to the southern-end of the project boundary for Track Option B. This species was not been observed in the ESL during protocol surveys in 2007. California clapper rail is believed to be currently absent from the ESL and areas adjacent to the southern-end of the project boundary for Track Option B.
Other raptors, migratory birds, and nesting birds	1	P	Medium	Suitable nesting habitat for migratory birds and other bird species occurs in the ESL. Numerous migratory birds were observed on site during biological surveys, but no nests were observed. Areas south of the southern-end of the project boundary for Track Option B also contain areas suitable for foraging and nesting, and birds have been observed in this area (e.g., great egret and great blue heron).
Mammals				
Pallid bat <i>Antrozous pallidus</i>	--/SSC/--	P	Low	Marginal roosting habitat for this species is present in the ESL, but it has not been observed in the ESL.
Hoary bat <i>Lasiurus cinereus</i>	--/--/G5, S4	P	Medium	Marginal roosting habitat for this species is present in the ESL, but it has not been observed in the ESL.
San Pablo vole <i>Microtus californicus sanpabloensis</i>	--/SSC/--	P	Medium	Marginal habitat for this species is present in the ESL, but it has not been observed in the ESL.
Salt-marsh harvest mouse <i>Reithrodontomys raviventris</i>	FE/SE,FP/--	P	Low	Marginal habitat for this species is present in the ESL and areas adjacent to the southern-end of the project boundary for Track Option B, but this species has not been observed. Salt-marsh harvest mouse is presumed absent from these areas due to low habitat quality and isolation from other suitable habitats.

Scientific Name/ Common Name	Federal/State/ CNPS Status	Habitat Present/ Absent	Likelihood of Occurrence	Rationale
Salt-marsh wandering shrew <i>Sorex vagrans halicoetes</i>	--/SSC/--	P	Medium	Marginal habitat for this species is present in the ESL, but it has not been observed in the ESL.
Fish				
North American green sturgeon, southern DPS <i>Acipenser medirostris</i>	FT/SSC/--	P	High	This species has the potential to occur in San Pablo Bay and could be present in or directly adjacent to the intertidal mudflats in the ESL during certain times of the year.
Delta smelt <i>Hypomesus transpacificus</i>	FT/--/--	P	High	This species has the potential to occur in San Pablo Bay and could be present in or directly adjacent to the intertidal mudflats in the ESL during certain times of the year.
River lamprey <i>Lampetra ayresi</i>	--/SSC/--	P	High	This species has the potential to occur in San Pablo Bay and could be present in or directly adjacent to the intertidal mudflats in the ESL during certain times of the year.
Sacramento splittail <i>Pogonichthys macrolepidotus</i>	--/SSC/--	P	High	This species has the potential to occur in San Pablo Bay and could be present in or directly adjacent to the intertidal mudflats in the ESL during certain times of the year.
Central California Coast Coho salmon <i>Oncorhynchus kisutch</i>	FE/SE/--	P	High	This species has the potential to occur in San Pablo Bay and could be present in or directly adjacent to the intertidal mudflats in the ESL during certain times of the year.
Central Valley Steelhead DPS <i>O. mykiss</i>	FT/--/--	P	High	This species has the potential to occur in San Pablo Bay and could be present in or directly adjacent to the intertidal mudflats in the ESL during certain times of the year.
Central Coastal California steelhead <i>O. mykiss</i>	FT/--/--	P	High	This species has the potential to occur in San Pablo Bay and could be present in or directly adjacent to the intertidal mudflats in the ESL during certain times of the year.
Central Valley fall-/late fall-run Chinook salmon <i>O. tshawytscha</i>	--/SSC/--	P	High	This species has the potential to occur in San Pablo Bay and could be present in or directly adjacent to the intertidal mudflats in the ESL during certain times of the year.
Central Valley spring-run Chinook salmon <i>O. tshawytscha</i>	FT/ST/--	P	High	This species has the potential to occur in San Pablo Bay and could be present in or directly adjacent to the intertidal mudflats in the ESL during certain times of the year.
Sacramento River winter-run Chinook salmon <i>O. tshawytscha</i>	FE/SE/--	P	High	This species has the potential to occur in San Pablo Bay and could be present in or directly adjacent to the intertidal mudflats in the ESL during certain times of the year.
Longfin smelt <i>Spirinchus thaleichthys</i>	--/ST/--	P	High	This species has the potential to occur in San Pablo Bay and could be present in or directly adjacent to the intertidal mudflats in the ESL during certain times of the year.
Plants				
Point Reyes bird's-beak <i>Cordylanthus maritimus</i> ssp. <i>palustris</i>	--/--/1B.2	P	Low	This species was not observed in the ESL during focused botanical surveys.

Scientific Name/ Common Name	Federal/State/ CNPS Status	Habitat Present/ Absent	Likelihood of Occurrence	Rationale
Soft bird's-beak Cordylanthus mollis ssp. mollis	--/--/1B.2	P	Low	This species was not observed in the ESL during focused botanical surveys.
Mason's liliaeopsis Lilaeopsis masonii	--/SR/1B.1	P	Low	This species was not observed in the ESL during focused botanical surveys.
Sensitive Natural Communities				
Coastal Brackish Marsh	--/--/G2, S2.1	P	NA	Coastal brackish marsh occurs in the ESL along the banks of Refugio Creek.
Northern Coastal Salt Marsh	--/--/G3, S3.2	P	NA	Northern coastal salt marsh occurs in the ESL along the San Pablo Bay shoreline in the vicinity of Hercules Point.
Eelgrass (<i>Zostera marina</i>) and widgeongrass (<i>Ruppia maritime</i>) beds		*		Surveys were conducted for eelgrass and widgeongrass beds. Surveys did not detect any eelgrass or widgeongrass; however, eelgrass or widgeongrass may colonize the intertidal mudflats of San Pablo Bay.

1 Raptors, migratory birds, and nesting birds are protected by a variety of Federal and State laws. See Chapter 1.3.1.3 and 1.3.2.3 for discussion.

Absent [A] means no further work needed. Present [P] means general habitat is present and species may be present. Status: Federal Endangered (FE); Federal Threatened (FT); Federal Proposed (FP); Federal Candidate (FC), Federal Species of Concern (FSC); State Endangered (SE); State Threatened (ST); State Fully Protected (SFP); State Rare (SR); State Species of Special Concern (SSC); CNPS List 1B (1B); CNPS List 2 (2).

Note: Track Option B was evaluated based on aerial photography, existing biological documents (e.g., WWR 2009b), and known current conditions of the areas. No known information is available for review for the northern-end of the project boundary for Track Option B. Studies are underway to ground- truth aerial photography and habitat conditions either suitable/non-suitable to sensitive species. Permits will be secured before construction begins.

Coastal Brackish Marsh

Coastal Brackish Marsh is similar to Coastal Salt Marshes, but is brackish from freshwater input. It is usually found at the interior edges of coastal bays and estuaries or in coastal lagoons. It is most extensively developed around Suisun Bay at the mouth of the Delta. Salinity may vary considerably, and may increase at high tide or during seasons of low freshwater runoff or both. Coastal Brackish Marshes usually intergrade with Coastal Salt Marshes toward the ocean and occasionally with Freshwater Marshes at the mouths of rivers, especially in the Delta. The habitat type is dominated by perennial, emergent, herbaceous monocots to two meters tall. Cover is often complete and dense (Holland 1986).

Coastal Brackish Marsh covers the banks of Refugio Creek. It is dominated by pickleweed, saltgrass, alkali heath, and creeping wildrye (*Leymus triticoides*). This sensitive natural community is represented by pickleweed brackish marsh in the ESL. The Coastal Brackish Marsh is considered a sensitive natural community because it foraging, cover, nesting, and roosting habitat for a variety of birds, mammals, reptiles, and amphibians. Some species are year around residents to this habitat and other are winter visitors that rely on these habitats for cover and foraging. In addition, a number of species from adjacent uplands visit the wetlands to feed (CWHR 2009d).

Northern Coastal Salt Marsh

Northern Coastal Salt Marsh is a natural community that typically crosses an elevation and vegetation gradient. Stands of cordgrass typically grow at the lowest elevation, nearest the open water; stands of pickleweed grow in the mid-elevation; and a richer mixture of plant species typically grows in the higher elevation, farthest from open water. At the project site, the community is best represented by California Cordgrass Tidal Marsh and Pickleweed Tidal Marsh. Northern Coastal Salt Marsh occurs at the project site in patches along the margin of Hercules Point.

Northern Coastal Salt Marsh is found in the sheltered inland margins of bays, lagoons, and estuaries, from the California-Oregon border south to Pt. Conception. It is most extensively developed in the San Francisco Bay. It is a highly productive community of herbaceous and suffrutescent, salt-tolerant hydrophytes forming moderate to dense cover and growing to one meter tall. Most species are active in the summer and dormant in the winter. Plant species are usually segregated horizontally with cord grass nearer the open water, pickleweed at mid-littoral elevations, and a richer mixture closer to high ground (Holland 1986).

Northern Coastal Salt Marsh is present along the margin of Hercules Point. A small amount of the community occurs within the project site. Within and adjacent to the project site, the community is best represented by California Cordgrass Tidal Marsh and Pickleweed Tidal Marsh. This habitat type provides similar habitat value for wildlife as Coastal Brackish Marsh but can also provide habitat for fish species that utilize shallow areas for foraging.

Eelgrass Beds

Eelgrass is a marine plant that grows in clear, well-lit, shallow soft-bottom coastal waters and provides shelter, nursery habitat, and food for a variety of fish birds, and invertebrates (Merkel & Associates 2000). Eelgrass meadows occur within the shallow bay habitats and in the more saline brackish water interfaces of the San Francisco Bay estuary (Merkel & Associates 2000).

Eelgrass clarifies water through sediment trapping and habitat stabilization. More specifically, it stabilizes shorelines by reducing wave impacts to the shoreline, thus reducing erosion. It also provides benefits of nutrient transformation and water oxygenation (Merkel & Associates 2000). Eelgrass beds are considered a Special Aquatic Site by the USACE and are regulated under Section 404 of the CWA. Eelgrass beds are also subject to BCDC jurisdiction under Section 66605 of the McAtteer-Petris Act and are afforded special management considerations by CDFG, USFWS, and NMFS. Eelgrass surveys conducted in the ESL during April 2007 and April 2010 did not detect any eelgrass or widgeongrass (WWR 2007b and HDR 2010c).

Intertidal Mudflats

Intertidal mudflats provide habitat for many species of invertebrates, and during low tide provide foraging and roosting areas used by numerous shorebirds during the spring migration. Intertidal mudflats are considered a Special Aquatic Site by the USACE and are therefore regulated under Section 404 of the CWA. Intertidal mudflats are also subject to BCDC jurisdiction under Section 66605 of the McAtteer-Petris Act.

Regionally Occurring Marine Mammals

Seven species of marine mammals reportedly occur in San Francisco Bay (Table 3.9-2) (NMFS 2007). The harbor seal, California sea lion, harbor porpoise (*Phocoena phocoena*), and the Eastern Pacific stock of the gray whale (*Eschrichtius robustus*) are the most common marine mammal species in the Bay (NMFS 2007). Habitat association of marine mammals in San Francisco Bay generally is related to distribution of their prey species (NMFS 2007).

Table 2.1-2 Common Marine Mammals in San Francisco Bay

Scientific Name	Common Name
<i>Phoca vitulina</i>	Harbor seal
<i>Zalophus californianus</i>	California sea lion
<i>Eumetopias jubatus</i>	Steller sea lion
<i>Eschrichtius robustus</i>	Gray whale
<i>Megaptera novaengliae</i>	Humpback whale
<i>Phocoena phocoena</i>	Harbor porpoise
<i>Enhydra lutra</i>	Southern sea otter

Pinnipeds. As reported by NMFS (2007), harbor seals are the only year-round resident of San Francisco Bay, using the area for breeding, pupping, foraging, and refugia. Harbor seals haul out onshore at specific locations within San Francisco Bay, utilizing mostly rocks and mud flats

exposed at low tides, sloughs, islands, and beaches, likely in proximity to food resources and distant from human activities (Allen 1991, as cited in NMFS 2007). The primary harbor seal colonies within San Francisco Bay are at Castro Rocks in the San Pablo Bay, Yerba Buena Island in Central Bay and Mowry Slough in the South Bay (NMFS 2007). Some colonies are only accessible at medium to high tides, such as the tidal mudflats and pickleweed marshes of Mowry and Newark Sloughs. Seals have abandoned several locations used in the past (e.g., Strawberry Spit) within San Francisco Bay due to human activities (Allen 1991, as cited in NMFS 2007). The harbor seal is the largest mammal found in association with mudflats and tidal salt marshes of San Pablo Bay (Coastal Conservancy and USACE 2000). Surveys estimate the resident San Francisco Bay population to be between 500 and 700 individuals (NMFS 2007). The average number of seals counted during the 2002 breeding/molt seasons was 117.5 at Castro Rocks, 96.6 at Yerba Buena Island and 147.6 at Mowry Slough (NMFS 2007).

As reported by NMFS (2007), California sea lions use San Francisco Bay for refugia and foraging, but do not breed or pup within the Bay. California sea lions are most abundant within the Bay while migrating to and from their primary breeding areas on the Farallon and California Channel Islands, and when Pacific herring and salmon are spawning in the bay. Sea lions can travel far up into the Delta, but most concentrate feeding in the Central Bay and where herring spawn (NMFS 2007). Similar to harbor seals, sea lions haul-out onshore, often utilizing anthropogenic structures such as boat docks and navigational buoys, although individuals may also haul out also on islands within San Francisco Bay, such as Alcatraz and Angel Islands. The largest California sea lion haul-out in San Francisco Bay is at the Port of San Francisco Pier 39, where up to 800 sea lions have been counted. Sea lions often float on the surface in large groups of 10 to 20 after feeding (NMFS 2007).

As reported by NMFS (2008), Steller sea lions are distributed throughout the North Pacific Ocean from California to Japan. The Eastern Distinct Population Segment of Steller sea lions (inhabiting California, Oregon, British Columbia and Southeast Alaska) are listed as threatened under the FESA, and are considered to be depleted under the MMPA. Steller sea lion rookeries are normally located on remote, offshore islands or reefs and require adequate areas above high water levels where young pups can survive most weather conditions and adequate prey is available on a consistent basis within the foraging range of lactating females (NMFS 2008). Steller sea lions historically occupied five major rookeries and haulouts in California (San Miguel Island, Año Nuevo Island, the Farallon Islands, Sugarloaf Island/Cape Mendocino, and Saint George Reef), however, several rookery and haulout sites along the California coast, primarily south of Año Nuevo, have been abandoned, as well as a documented rookery at Seal Rocks near San Francisco (NMFS 2008). Numbers of non-pup Steller sea lions at the two central California sites, Año Nuevo and the Farallon Islands, are currently only about 20 percent of the levels reported between 1927 and 1964 (NMFS 2008). Pacific herring is a major prey item for Steller sea lions that are drawn to the Bay (NMFS 2007).

Cetaceans. Seasonally migrating cetaceans, such as the gray whale and humpback whale, enter the Central Bay during their migrations to feed (NMFS 2007). The Eastern Pacific gray whale migrates between calving grounds in Baja, Mexico to primary feeding grounds in Alaska

and Canada on an annual basis. Gray whales are commonly sighted near the Golden Gate during peak migration periods (northward migration in spring and southward migration in winter), and annually a few individuals are observed within the Bay (Green et al. 2006, as cited in NMFS 2007). Gray whales prey mostly on invertebrates that live on or in soft sediments, while humpback whales primarily feed on krill and various small fish species. Humpback whales are currently listed under the FESA as endangered, and are designated as depleted under the MMPA. Gray whales were delisted from the FESA in 1994.

The harbor porpoise is a near-shore species, commonly observed near the Golden Gate Bridge and areas of the Central Bay (NMFS 2007). However, there are no confident harbor porpoise population estimates (NMFS 2007). Harbor porpoise eat mostly small schooling fish and invertebrates, and along with seals and sea lions, will feed on herring and anchovies (NMFS 2007).

Southern sea otter. Southern sea otters are listed as threatened under the FESA, designated as depleted under the MMPA, and are designated as a fully protected mammal under California state law (CDFG Code 4700) (USFWS 2008). The 2007 3-year running average (2006-2008) is 2,826 individuals (USFWS 2008). Based on three-year running averages of the annual spring counts, the mainland southern sea otter population increased by an average of about three percent per year from 2003 to the present (USFWS 2008). A major oil spill from a tanker in the waters in the vicinity of the range of the southern sea otter has traditionally been considered to be the most serious potential threat to the species (USFWS 2003). However, since its listing under the ESA, pollution and incidental take in fisheries have also been recognized as substantial problems (USFWS 2003). Sea otters may occupy nearshore waters along the mainland coastline of California from San Mateo County to Santa Barbara County. However, the northern limit of their distribution is reported to be at Point Año Nuevo, near Half Moon Bay (USFWS 2003). Sea otters occupy hard- and soft-sediment marine habitats from the littoral zone to depths of less than 100 meters (330 feet), including protected bays and exposed outer coasts (USFWS 2003). Most individuals occur between shore and the 20-meter (65-foot) depth contour (USFWS 2003).

3.9.3.2 Regional Fisheries Resources

Regional fisheries resources in the ESL and vicinity include the waters of San Pablo Bay and Refugio Creek. Fish species in the project region utilize several different habitats, including open waters, tidal wetlands, intertidal mudflats, and creeks. The following paragraphs discuss fisheries resources present within the San Pablo Bay region followed by a discussion of fisheries resources present in Refugio Creek.

San Pablo Bay Region

The San Pablo Bay watershed, approximately 900 square miles in area, includes those lands in the northern reaches of the Bay Area whose streams flow into San Pablo Bay; the watershed is a major drainage basin for Marin, Sonoma, Solano, and Contra Costa counties (USACE 1999). This watershed is a component of the much larger San Francisco Bay-Delta Estuary, which includes the Sacramento and San Joaquin Rivers. The San Pablo Bay watershed lies between

the Suisun Bay to the east and the San Francisco Bay to the south (Coastal Conservancy and the USACE 2000).

Numerous factors (i.e., tidal inflows from San Francisco Bay, freshwater flows from the Delta and its own watershed, the topography of the land and the climate) influence the hydrology of the San Pablo Bay watershed (Coastal Conservancy and the USACE 2000). Twice daily, the saline waters from San Francisco Bay flow into San Pablo Bay. The effects of the tides extend well upstream into the freshwater tributaries to San Pablo Bay (Coastal Conservancy and the USACE 2000). The interaction between the fresh and saline water has a major influence on the circulation of water in the San Pablo Bay itself (Coastal Conservancy and the USACE 2000), and on temperature fields in the bay, which have an important influence on the ecology of the aquatic resources and the distribution of species in San Pablo Bay (WWR 2007). More than 50 fish species inhabit the San Pablo Bay watershed (Coastal Conservancy and the USACE 2000). Table 3.9-3 presents common fish species that have been encountered in San Pablo Bay (in the project vicinity). Life history descriptions for special-status fish species are provided in Appendix G.

Table 2.1-3 Common Fish Species in San Pablo Bay

Common Name	Scientific Name	Native (N) or Nonnative (I)	Fishery Management Plan Designation
Northern Anchovy	<i>Engraulis mordax</i>	N	FMP – Coastal Pelagic
Longfin Smelt	<i>Spirinchus thaleichthys</i>	N	N/A
Pacific Herring	<i>Clupea pallasii</i>	I	CDFG has initiated a FMP
Striped Bass	<i>Morone saxatilis</i>	I	N/A
American Shad	<i>Alosa sapidissima</i>	I	N/A
Shiner Perch	<i>Cymatogaster aggregate</i>	N	N/A
Plainfin Midshipman	<i>Porichthys notatus</i>	N	N/A
Topsmelt	<i>Atherinops affinis</i>	N	N/A
Jacksmelt	<i>Atherinopsis californiensis</i>	N	N/A
Threadfin Shad	<i>Dorosoma petenense</i>	I	N/A
White Croaker	<i>Genyonemus lineatus</i>	N	N/A
Starry Flounder	<i>Platichthys stellatus</i>	N	FMP – Groundfish
Pacific Tomcod	<i>Microgadus proximus</i>	N	N/A
Yellowfin Goby	<i>Acanthogobius flavimanus</i>	I	N/A
Whitebait Smelt	<i>Allosmerus elongatus</i>	N	N/A
Delta Smelt	<i>Hypomesus tanspacificus</i>	N	N/A
Pacific Staghorn Sculpin	<i>Leptocottus armatus</i>	N	N/A
Sacramento River winter-run Chinook salmon	<i>Oncorhynchus tshawytscha</i>	N	N/A
Central Valley spring-run Chinook salmon	<i>O. tshawytscha</i>	N	N/A
California coastal ESU Chinook salmon	<i>O. tshawytscha</i>	N	N/A
Pacific Pompano	<i>Peprilus simillimus</i>	N	N/A
Splittail	<i>Pogonichthys macrolepidotus</i>	N	N/A
Bat Ray	<i>Myliobatus californica</i>	N	N/A
Brown Smoothound	<i>Mustelus henlei</i>	N	N/A

Common Name	Scientific Name	Native (N) or Nonnative (I)	Fishery Management Plan Designation
White Seaperch	<i>Phanerodon furcatus</i>	N	N/A
Threespine Stickback	<i>Gasterosteus aculeatus</i>	N	N/A
Walleye Surfperch	<i>Hyperprosopon argenteum</i>	N	N/A
Night Smelt	<i>Spirinchus starksii</i>	N	N/A
White Sturgeon	<i>Acipenser transmontanus</i>	N	N/A
English Sole	<i>Parophrys vetulus</i>	N	FMP – Groundfish
California Grunion	<i>Leuresthes tenuis</i>	N	N/A
Surf Smelt	<i>Hypomesus pretiosus</i>	N	N/A
Speckled Sandab	<i>Citharichthys stigmaeus</i>	N	N/A
Big Skate	<i>Raja binoculatus</i>	N	FMP – Groundfish
Pacific Sardine	<i>Sardinops sagax</i>	N	FMP – Coastal Pelagic
Bay Goby	<i>Lepidogobius lepidus</i>	N	N/A
Spiny Dogfish	<i>Squalus acanthias</i>	N	FMP – Groundfish
Coastal California Steelhead	<i>Oncorhynchus mykiss</i>	N	N/A
Central Valley Steelhead	<i>O. mykiss</i>	N	N/A
Pile Perch	<i>Rhacochilus vacca</i>	N	N/A
Pacific Sanddab	<i>Citharichthys sordidus</i>	N	N/A
Green Sturgeon	<i>Acipenser medirostris</i>	N	N/A
Pacific Lamprey	<i>Lampetra tridentata</i>	N	N/A
Leopard Shark	<i>Triakus semifasciata</i>	N	FMP – Groundfish
Inland Silverside	<i>Menidia beryllina</i>	I	N/A
River Lamprey	<i>Lampetra ayresi</i>	N	N/A
Arrow Goby	<i>Clevelandia ios</i>	N	N/A
Diamond Turbot	<i>Pleuronichthys guttulatus</i>	N	N/A
Chameleon Goby	<i>Tridentiger trigonocephalus</i>	I	N/A
California Halibut	<i>Paralichthys californicus</i>	N	N/A
Bay Pipefish	<i>Syngnathus leptorhynchus</i>	N	N/A
White Sea Bass	<i>Atractoscion nobilis</i>	N	N/A
Sacramento Pikeminnow	<i>Ptychocheilus grandis</i>	N	N/A
Rock Sole	<i>Lepidopsetta bilineata</i>	N	N/A
Pacific Halibut	<i>Hippoglossus stenolepis</i>	N	N/A
Tule Perch	<i>Hysterocarpus traskii</i>	N	N/A
Shimofuri Goby	<i>Tridentiger bifasciatus</i>	I	N/A
Rubberlip Seapeach	<i>Rhacochilus toxotes</i>	N	N/A
Prickly Sculpin	<i>Cottus asper</i>	N	N/A
Longjaw Mudsucker	<i>Gillichthys mirabilis</i>	N	N/A
Sand Sole	<i>Cynoglossus capensis</i>	I	FMP – Groundfish

Sources: Modified from WWR 2007, Coastal Conservancy and USACE 2000, NMFS 2007.

3.9.3.3 Regionally Important Commercial and/or Recreational Fisheries

Several species of fish occur in San Pablo Bay that are managed under a Fishery Management Plan and have designated EFH because they provide regionally important commercial fisheries;

however, they do not otherwise have a special-status designation. In addition, several species of fish and shellfish occurring in San Pablo Bay provide important commercial and/or recreational fisheries but do not have a special-status designation and are also not managed under a Fishery Management Plan and have no designated EFH. These regionally important commercial and/or recreational fisheries are listed in Table 3.9-4 and are discussed in further detail in Appendix G.

Table 2.1-4 Regionally Important Commercial and/or Recreational Fisheries

Common Name	Scientific Name	Fishery Management Plan
Northern Anchovy	<i>Engraulis mordax</i>	Coastal Pelagic
Starry Flounder	<i>Platichthys stellatus</i>	Groundfish
Chinook/Coho salmon	<i>Oncorhynchus tshawytscha/O. kisutch</i>	Pacific Coast Salmon
English Sole	<i>Parophrys vetulus</i>	Groundfish
Big Skate	<i>Raja binoculata</i>	Groundfish
Pacific Sardine	<i>Sardinops sagax</i>	Coastal Pelagic
Spiny Dogfish	<i>Squalus acanthias</i>	Groundfish
Leopard Shark	<i>Triakis semifasciata</i>	Groundfish
Sand Sole	<i>Cynoglossus capensis</i>	Groundfish
California Halibut	<i>Paralichthys californicus</i>	N/A
Pacific Halibut	<i>Hippoglossus stenolepis</i>	N/A
Pacific herring	<i>Clupea pallasii</i>	N/A
Dungeness Crab	<i>Cancer magister</i>	N/A

Sources: NMFS Website 2009

Refugio Creek

A perennial and tidally influenced stream, Refugio Creek drains an area of 4.87 square miles of Northwestern Contra Costa County into the San Pablo bay. The mainstem of Refugio Creek is 4.52 miles long (WWR 2007a). The creek's various tributaries, including its two largest, Ohlone Creek and the north tributary, add nearly five more miles of stream length for a total watershed channel length of 9.17 miles (CCCCDD 2003 in City of Hercules 2009b).

Refugio Creek in the project area is low in gradient, confined, and shows significant man-made manipulations (WWR 2007a). The channel was deepened and straightened in the early 20th century by the Company property owners. Large areas of the creek banks have been stabilized with sandbags and do not contain vegetation.

Refugio Creek only contains two documented fish species; the mosquito fish (*Gambusia affinis*) and the threespine stickleback (*Gasterosteus aculeatus*) (Leidy 2007). These two species are not designated threatened, endangered, or of concern by federal or state resource agencies. Biological information characterized from a single general fish distribution survey of Refugio Creek (study completed by Robert Leidy in conjunction with CDFG in 1981), found no evidence of historical or current use of the Refugio Creek by steelhead or salmon (Leidy et al. 2005). Furthermore, Leidy et al. (2005) state that "The small relative size of the watershed

and condition as assessed by CDFG staff indicate that it is not of regional significance to the native *O. mykiss* population”.

3.9.3.4 Invasive Species

The upland portions of the project site are disturbed and contain primarily nonnative species, many of which are considered invasive by the California Department of Food and Agriculture and the California Invasive Pest Plant Council. However, these species are ubiquitous to disturbed habitats in the region. Nonnative aquatic nuisance species such as cordgrass are currently absent from the project site. California cordgrass dominates the habitat type, growing in dense homogenous stands. Based on size and structure, all of the cordgrass at the project site appears to be the native California cordgrass and not among the invasive species of cordgrass.

3.9.3.5 Waters of the U.S., Including Wetlands

Wetlands and other waters have been delineated within the ESL. These areas potentially fall under the jurisdiction of USACE, BCDC, RWQCB, and CDFG. All USACE-jurisdictional areas that are within the coastal zone are here considered BCDC-jurisdictional. Additionally, BCDC may take jurisdiction over some areas that do not meet all three parameters necessary for USACE jurisdiction. Table 3.9-5 presents acreages of wetlands and other waters that may fall under USACE or BCDC jurisdiction.

Table 2.1-5 Acreages of Potentially Jurisdictional Wetlands and Other Waters in the Environmental Study Limit

Feature	USACE Jurisdiction *Area (acres)	BCDC Jurisdiction *Area (acres)
Wetland Features		
Pickleweed Tidal Marsh	2.86	2.53
California Cordgrass Tidal Marsh	4.05	4.05
Pickleweed Brackish Marsh	9.05	8.44
Cattail Marsh	3.59	0.05
Freshwater Wetland Swale	0.41	0.09
Seasonal Wetland	2.09	0.88
**Willow Riparian Woodland	0.00	0.37
Wetland Feature Subtotal	22.05	16.41
Other Waters		
Intertidal Mudflat	96.46	96.46
Brackish Stream	0.68	0.21
Freshwater Intermittent Drainage	0.08	0.00
Open Water	0.10	0.10
Other Waters Subtotal	97.32	96.77
Total Acreage of Potentially Jurisdictional Wetlands and Other Waters in the Environmental Study Limit	119.37	113.18

* Acreage calculations were rounded to the nearest hundredth of an acre.

**Willow Riparian Forest refers to those riparian areas that do not meet all three parameters for USACE jurisdiction. Those riparian areas that meet all three parameters and exhibit willow riparian characteristics, are described in other categories (i.e., Freshwater Wetland Swale, Freshwater Seasonal Wetland, and Brackish Marsh).

3.10 Water Resources

This section describes the existing surface and groundwater resources and the associated regulatory framework for implementation of the Hercules ITC.

3.10.1 Regulatory Framework

This section describes the federal, state, and local laws regulatory context to be considered for the proposed project.

3.10.1.1 Federal Regulations

Clean Water Act of 1977 (33 USC 1251 et seq.)

The CWA established the basic structure for regulating discharges of pollutants into the waters of the U.S. and gave the USEPA the authority to implement pollution control programs such as setting wastewater standards for industry. The CWA sets water quality standards for all contaminants in surface waters. The statute employs a variety of regulatory and non-regulatory tools to sharply reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. The major sections of the CWA that apply to the activities potentially occurring as part of the proposed project include dredging and discharge activities (Sections 401 and 404) and the NPDES (Section 402).

Section 404. Section 404 of the CWA establishes a program to regulate the discharge of dredged and fill material into waters of the U.S., including wetlands. Activities in waters of the U.S. that are regulated under this program include fills for development, water resource projects (e.g., dams and levees), infrastructure development (e.g., highways and airports), and conversion of wetlands to uplands for farming and forestry. Under Section 404, any person or public agency proposing to locate a structure, excavate, or discharge dredged or fill material into waters of the U.S. or to transport dredged material for the purpose of dumping it into ocean waters must obtain a permit from the USACE. The USACE has jurisdiction over all waters of the U.S. including, but not limited to, perennial and intermittent streams, lakes, ponds, as well as wetlands in marshes, wet meadows, and side hill seeps. The City will be required to apply for a Section 404 permit for the project.

Section 401. Under Section 401 of the CWA, every applicant for a federal permit or license for any activity which may result in a discharge to a water body must obtain State Water Quality Certification that the proposed activity will comply with state water quality standards. The City will need a Section 401 water quality certification, issued by the San Francisco Bay Regional Water Quality Control Board (RWQCB), for project work permitted under the Section 404 process.

Section 402. Section 402 of the CWA authorizes the NPDES permit program. Stormwater discharges associated with construction activities are regulated under the Construction Activities General Stormwater Permit adopted by the state on August 19, 1999 (WQO 99-08 DWQ, NPDES Permit No. CAS000002). Under this permit, owners of land where a construction activity occurs that disturbs more than 1 acre of land must submit a NOI, develop

a SWPPP, conduct monitoring and inspections, retain records of the monitoring, report incidences of noncompliance, and submit annual compliance reports.

The 1987 amendments to the CWA (Section 402[p]) recognized the need to address nonpoint source stormwater runoff pollution and expanded the NPDES program to operators of municipal separate storm sewer systems (MS4s), construction projects, and industrial facilities. Contra C Contra Costa County Flood Control and Water Conservation District, Contra Costa County, and 16 incorporated cities in the County, including the City, participate in a joint MS4 (NPDES Permit No. CA0029912) issued by the San Francisco Bay RWQCB. This MS4 permit establishes the Stormwater Management Plan (SWMP) for the Contra Costa Clean Water Program. The plan strives to protect the beneficial uses of receiving waters, which are identified by the San Francisco Basin Plan for the Bay and tributary waters.

Section 303(d). In June 2007, USEPA Region 9 issued the final 2006 CWA Section 303(d) list of water quality limited (“impaired”) segments requiring total maximum daily loads (TMDLs) (USEPA 2007a). San Pablo Bay is currently listed as impaired for exotic species and various constituents under Section 303(d) of the CWA (Table 3.10-1). Refugio Creek is not included on the 2006 303(d) list.

Table 3.10-1 Section 303(D) Listed Constituents of Concern for San Pablo Bay

Pollutant/Stressor	Potential Source	Estimated Area Affected	Proposed TMDL Completion
Chlordane	Nonpoint Source	68,349 acres	2008
DDT	Nonpoint Source	68,349 acres	2008
Dieldrin	Nonpoint Source	68,349 acres	2008
Dioxin Compounds	Atmospheric Deposition	68,349 acres	2019
Exotic Species	Ballast Water	68,349 acres	2019
Furan Compounds	Atmospheric Deposition	68,349 acres	2019
Mercury	Municipal Point Sources, Resource Extraction, Atmospheric Deposition, Natural Sources, Nonpoint Source	68,349 acres	2006
Nickel	Source Unknown	68,349 acres	2019
PCBs	Unknown Nonpoint Source	68,349 acres	2006
PCBs (Dioxin-Like)	Unknown Nonpoint Source	68,349 acres	2019
Selenium	Industrial Point Sources, Agriculture, Natural Sources, Exotic Species	68,349 acres	2019

Source: USEPA 2007a

Rivers and Harbors Act of 1899 (33 USC 401 et seq.)

The USACE is authorized to regulate the construction of any structure or work within navigable waters under sections 9 and 10 of the Rivers and Harbors Act. The Rivers and Harbors Act authorizes the USACE to regulate the construction of such diverse activities as wharves, breakwaters, or jetties; bank protection or stabilization projects; permanent mooring structures, vessels, or marinas; intake or outfall pipes; canals; boat ramps; aids to navigation; or

other modifications affecting the course, location condition, or capacity of navigable waters. The USACE' jurisdiction under the Rivers and Harbors Act is limited to "navigable waters," or waters subject to the ebb and flow of the tide shoreward to the mean high water mark that may be used to transport interstate or foreign commerce. The USACE must consider the following criteria when evaluating projects within navigable waters: (1) the public and private need for the activity; (2) reasonable alternative locations and methods; and (3) the beneficial and detrimental effects on the public and private uses to which the area is suited. The City will be required to apply for a Section 10 permit for the project.

3.10.1.2 State Regulations

Porter-Cologne Water Quality Control Act (California Water Code Section 13000 et seq.)

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act) defines water quality objectives for California as the limits or levels of water constituents that are established for reasonable protection of beneficial uses. The Porter-Cologne Act requires the RWQCBs to establish water quality objectives, while acknowledging that water quality may be changed to some degree without unreasonably affecting beneficial uses. Beneficial uses, together with the corresponding water quality objectives, are defined as standards, per Federal regulations. Therefore, the regional plans form the regulatory references for meeting state and federal requirements for water quality control. Changes in water quality are only allowed if the change is consistent with the maximum beneficial use of the State, does not unreasonably affect the present or anticipated beneficial uses, and does not result in water quality less than that prescribed in the water quality control plans.

California Toxics Rule

The USEPA has developed water quality criteria for priority toxic pollutants and other provisions for water quality standards to be applied to inland surface waters, enclosed bays, and estuaries in the State of California. This rule was developed to address a gap in California's water quality standards that was created when the state's water quality control plans containing water quality criteria for priority toxic pollutants were overturned in 1994. The established numerical standards were deemed necessary to protect human health and the environment. The rule includes ambient aquatic life criteria for 23 priority toxic pollutants, ambient human health criteria for 57 priority toxics, and a compliance schedule.

State Lands Commission (Public Resources Code Section 6001 et seq.)

Projects involving use of state lands may require lease or permitting from the State Lands Commission, which is charged with managing California's sovereign lands for purposes consistent with the public trust.

3.10.1.3 Local Regulations

Water Quality Control Plan for San Francisco Bay Basin

The project site is located within the southern portion of the San Francisco Bay Basin, which is governed by the San Francisco Bay RWQCB. The San Francisco RWQCB has adopted a basin plan in accordance with criteria in the Porter-Cologne Act, the CWA, and other pertinent state and federal laws and regulations.

The San Francisco Bay Basin Plan identifies surface waters in the region as consisting of inland surface water (freshwater lakes, rivers, and streams), estuaries, enclosed bays, and ocean waters. Historic and ongoing waste loads contributed to the surface water bodies in the region come from upstream discharges carried into the region via Delta outflow, direct input in the forms of point and nonpoint sources, and indirect input via groundwater seepage (SFBRWQCB 2007). The Basin Plan describes the water quality control measures that contribute to the protection of the beneficial uses of the Bay watershed and identifies beneficial uses for each segment of the Bay and its tributaries, water quality objectives for the reasonable protection of the uses, and an implementation plan for achieving these objectives.

McAteer-Petris Act (Public Resources Code 66600 et seq.)

The San Francisco Bay Conservation and Development Commission (BCDC) is responsible for implementing the McAteer-Petris Act. The Act directs the BCDC to exercise its authority to issue or deny permit applications for placing fill, extracting minerals, or changing the use of any land, water, or structure within the area of its jurisdiction (the Bay waters and 100 feet above the shoreline). The BCDC also carries out determinations of consistency with the Federal Coastal Zone Protection Act for federally-sponsored projects.

City of Hercules General Plan

The General Plan lists the following relevant objectives and policies related to water resources.

Land Use Element

- ◆ **Objective 13:** Attain compatible land uses within existing and planned development areas.
 - ▲ **Policy 13B:** Design of the flood control improvements along Refugio Creek should be done in a manner to function as a transition area between land uses.

Safety Element

- ◆ **Objective 4:** Reduce flood hazards through flood channel improvements and development standards.
 - ▲ **Policy 4A:** Refugio Creek Channel should be improved for existing drainage so that adequate capacity for expected flood flow is provided.

- ▲ **Policy 4B:** New development should be located and designed to minimize generation of and exposure to flood hazards.

Open Space/Conservation Element

- ◆ **Objective 4:** Protect riparian and wetland communities from degradation through introduction of urban pollutants in stormwater runoff.
 - ▲ **Policy 4a:** The City shall require project proponents to design facilities to prevent degradation of riparian and wetland communities from urban pollutants in storm runoff.
 - ▲ **Program 4a.1:** To minimize pollution downstream from sedimentation, the City shall require installation of sedimentation and grease basins in the storm drain system in parking lots in accordance with NPDES regulations and shall require that property owners maintain the basins annually, or as required by NPDES regulations. Parking lots shall be swept periodically to decrease the amount of debris that could potentially contaminate the riparian or wetland habitat.
- ◆ **Objective 9:** Improve surface runoff water quality
- ◆ **Objective 10:** Reduce flooding potential within floodprone areas.
 - ▲ **Policy 10a:** Ensure that adequate drainage facilities and pollution prevention and control infrastructure are built to accommodate the increase in runoff from newly developed areas.
 - ▲ **Program 10a.2:** For each proposed development project, runoff calculations for the parcel at full build-out shall be measured against estimates of existing runoff to ensure that no flooding will result.

Safety Element

- ◆ **Objective 1:** Consider potential flood hazards and introduce adequate safety measures in development plans and proposals.
 - ▲ **Program 1A.1 Item 1:** Planned development plans must be prepared and adopted for all new development projects. Safety measures will be incorporated into these planned development plans to provide adequate protection from seismic, geologic, flood and fire hazards.
 - ▲ **Program 1A.1 Item 2:** The review and approval of zoning applications, tentative maps, and planned development plans shall include consideration of safety policies and standards contained in the General Plan and other area plans.
 - ▲ **Program 1A.2 Item 1:** The subdivision, zoning and grading regulations govern the subdivision of land, and the design and construction of site improvements. Seismic, geologic, flood and fire hazards shall be considered in the review and approval of tract maps, grading and improvement plans.

◆ **Objective 4:** Reduce flood hazards through flood channel improvements and development standards.

- ▲ **Policy 4A:** Refugio Creek Channel should be improved to provide adequate capacity for expected flood flows.
- ▲ **Program 4A.1:** Development projects along the stream channel shall include plans to improve drainage flows consistent with protection of riparian habitats and wetlands as approved by the CDFG and Corps.
- ▲ **Policy 4B:** New development shall be located and designed to minimize generation of and exposure to flood hazards.
- ▲ **Program 4B.1:** Subdivision and planned development plan applications shall include measures to promote flood safety. These measures shall be evaluated during application review and implemented through adoption as conditions of approval for the project.
 1. Review of any significant project proposals for areas, which are not presently in flood zones should include an evaluation of increased downstream flows resulting from the project.
 2. Finished floor elevation for all developments must be one foot about the 100-year flood elevations prescribed on the Flood Insurance Rate Map.
 3. In order to protect lives and property, intensive development should not be permitted in reclaimed areas unless food control protection in such areas is constructed to the standards of the Flood Disaster Protection Act of 1973.

City of Hercules Flood Damage Prevention Ordinance

The City's storm water management and discharge control ordinance (Title 5, Chapter 8 of the Hercules Municipal Code) protects and enhances water quality in the City's watercourses pursuant to and consistent with the Porter-Cologne Water Quality Control Act (Water Code Section 13000 et seq.) and the Federal Clean Water Act (33 U.S.C. Section 1251 et seq.). It also carries out mitigation requirements set forth in the City NPDES permit.

The ordinance requires that every application for a development project subject to the development runoff requirements in the City's NPDES permit be accompanied by a storm water control plan that meets the criteria in the most recent version of the Contra Costa Clean Water Program Stormwater C.3 Guidebook. The ordinance establishes best management practices and standards that address both short-term construction activities and long-term, ongoing operations. The ordinance also establishes prohibitions against unlawful discharges into receiving waters.

City of Hercules Flood Damage Prevention Ordinance

The City's flood damage prevention ordinance (Title 10, Chapter 7 of the Hercules Municipal Code) seeks to protect public health safety, and general welfare and to minimize public and

private losses due to flood conditions in specific areas through legally enforceable regulations applied uniformly to flood-prone, mudslide (i.e., mudflow), or flood-related erosion areas.

The ordinance establishes a procedure by which a floodplain administrator (City's public works director) reviews applications for development in flood hazard areas identified on FEMA's Flood Insurance Rate Maps to verify that local, state, and federal permit requirements have been met; that the site is reasonably safe from flooding; and that the proposed development would not adversely affect carrying capacities (i.e., the cumulative effect of the proposed development when combined with all other existing and anticipated development would not increase the water surface elevation of the base flood more than one foot at any point within the City of Hercules).

The ordinance also establishes specific construction standards for various types of development in flood hazard areas.

3.10.2 Existing Conditions

3.10.2.1 Regional Hydrology

The City is located in the Contra Costa County Watershed Management Area (CCCWMA), which is one of eight counties in the San Francisco Bay Hydrologic Region (HR). The San Francisco HR encompasses approximately 2.88 million acres (4,500 square miles). Characteristics of the region include significant geological features and sensitive habitat areas located in close proximity to densely populated urban centers. Regionally significant geologic features of the San Francisco Bay HR that influence drainage and hydrology are the valleys of Santa Clara, Napa, Petaluma, Livermore, Sonoma, and Suisun-Fairfield; the peninsulas of Marin and San Francisco; the bays of San Francisco, San Pablo, and Suisun; the mountain ranges of Santa Cruz, Diablo, Bolinas Ridge; and the Vaca Mountains of the Coast Range.

The CCCWMA can be further defined as being located within National Hydrography Dataset (NHD) 1805002. The NHD is a USGS database that contains geospatial information about the nation's surface water. An NHD includes hydrologic surface water features such as the watershed boundary, water bodies, watercourses, and water basins/subbasins. The CCCWMA contains 17 municipalities and unincorporated county territory within the limits of this watershed. The City is one of these municipalities.

The CCCWMA is further subdivided into three geographic areas within the watershed area boundary. These geographic areas are the West, Central, and East counties. The City is located within the West county portion of the CCCWMA. The West county portion of the watershed contains 27 percent of the urbanized land in the County and is composed of residential, commercial, and industrial uses. "Dirty" industrial uses such as the former Hercules Powder Works were established in this area, including petroleum refineries and chemical companies. The major watercourses that traverse this watershed are Wildcat Creek and San Pablo Creek, which both discharge to San Pablo Bay.

San Pablo Bay

San Pablo Bay is a shallow tidal estuary that forms part of the San Francisco Bay-Delta Estuary (Estuary), which also includes San Francisco Bay, Suisun Bay, and the Delta. The Estuary watershed drains more than 40 percent of California's surface area. San Pablo Bay lies between the less salty Suisun Bay and the saltier San Francisco Bay. Salinity in San Pablo Bay ranges from 18 to 30 parts per thousand (USACE and Coastal Conservancy 1999).

San Pablo Bay consists of a 30-foot-deep ship channel surrounded by wide shallow shoals, especially north of the channel. The average depth of San Pablo Bay is approximately 9 feet Mean Lower Low Water (MLLW) and approximately 57 percent of the total area of the bay is shallower than about 7 feet (USGS 1984).

Tidal inflows from San Francisco Bay, freshwater flows from the Delta and its watershed, the topography of the land and the climate all influence the hydrology of the San Pablo Bay. Twice daily, the saline waters from San Francisco Bay flow into San Pablo Bay. The effects of the tides extend well upstream into the freshwater tributaries to San Pablo Bay. The freshwater flows are continuous, but vary on a seasonal basis due to their dependence on rainfall. The major source of freshwater to San Pablo Bay is inflow from the Delta (over 90 percent on an annual basis). The degree of mixing depends on seasonally varying river inflow. The timing and magnitude of the highly seasonal river inflow modulates permanent estuarine circulation, which is largely maintained by salinity controlled density differences between river and ocean waters.

San Pablo Bay is at the confluence of several major environmental stressors/contaminants. These include sediment loads and pesticide residues from California's Central Valley, the Sierra Nevada, and the coastal range; industrial waste from the Bay Area (including several oil refineries); and the site of the Mare Island Naval Shipyard (now closed).

Beneficial uses of San Pablo Bay include commercial and sport fishing, estuarine habitat, industrial water supply, fish migration, navigation, industrial process water supply, preservation of rare and endangered species, contact and non-contact water recreation, shellfish harvesting, fish spawning, and wildlife habitat (SFBRWQCB 2007).

Since 1993, the San Francisco Estuary Institute has administered a Regional Monitoring Program (RMP) for the RWQCB and major Bay dischargers. The RMP measures concentration of trace constituents in water, sediment, and transplanted bivalves at various locations in the Estuary. RMP data presented in the Annual Report 2004-2005 (SFEI 2006a) and Pulse of the Estuary 2006 (SFEI 2006b) summarize trends and issues in the Estuary. The Pulse of the Estuary summarizes the status of chemical contamination in the Estuary using RMP results and indicates top contamination as follows:

- ◆ High levels of mercury and polychlorinated biphenyls (PCBs) in fish and water;
- ◆ Water quality objectives for cyanide, copper, and nickel;
- ◆ Pyrethroid insecticides from the Delta that are highly toxic to fish; and

- ◆ Brominated flame retardant (PBDEs) and fluorinated stain repellants (PFCs) that appear in water and sediment.

3.10.2.2 Local Hydrology

The City is located mostly in the Refugio Valley along San Pablo Bay, on the northeast side of the Bay area. Much of the Refugio Valley has elevations ranging from 7.5 to 14.3 feet above mean sea level (msl); however, the high ground surrounding portions of it rises to over 200 feet msl in the project area and more than 500 feet above msl on the surrounding ridge lines. Mean annual precipitation is approximately 20 inches, and mean annual runoff is about three inches (City of Hercules 1998b). The general trend of drainage in the area is to the northwest into San Pablo Bay.

The project site is located in Hercules on the undeveloped southeastern shoreline of San Pablo Bay and along both sides of Refugio Creek. The Refugio Creek outfall to San Pablo Bay is located on the project site immediately east of Hercules Point. Refugio Creek and its tributaries drain the bulk of the City and also a significant basin upstream of the City.

Refugio Creek

The Refugio Creek watershed drains 4.87 square miles of northwestern Contra Costa County into San Pablo Bay. Ninety-seven percent of the watershed is within the City (CCC 2003). The main stem of Refugio Creek is 4.52 miles long. The creek's various tributaries, including its two largest, Ohlone Creek and the north tributary, add nearly five more miles of stream length for a total watershed channel length of 9.17 miles (CCC 2003). The estimated mean daily flow of Refugio Creek is 4.2 cubic feet per second (cfs). Roughly 83 percent of the channel banks are natural, while 15 percent are concrete-lined; the remainder is constructed earth.

Refugio Creek is the primary surface water source within the City. Refugio Creek is a perennial stream that flows north and northwesterly through the project site and then passes through three 72-inch culverts beneath the UPRR right-of-way before discharging into San Pablo Bay. Immediately before crossing under the UPRR railroad, Refugio Creek makes two ninety-degree turns before discharging into San Pablo Bay.

The segment of Refugio Creek channel from the proposed project's southern (upstream) boundary northward (downstream) to immediately north of the proposed Bayfront Bridge includes approximately more than 1,200 linear feet of tidal channel. In this portion of the creek, the existing low-flow creek channel varies in width (top-of-bank to top-of-bank) from approximately 20 feet in the upstream portion to about 40 feet in the downstream portion. A non-tidal tributary, referred to as the North Channel, enters the main creek channel from the northeast near the southern (upstream) project boundary. An additional non-tidal tributary (referred to as the Central Channel) enters the main creek channel from the south approximately in the middle of the main channel length on the project site.

Refugio Creek in the project area is low gradient and confined, and shows significant man-made alterations. The channel was deepened, straightened, and channelized in the early 1900s

by the Hercules Powder Company. Fill has been placed up to the creek edge, resulting in creek banks that are range in height from eight to 14 feet high from creek bed to top-of-bank. The channel is about 30 feet wide (measured from the tops of the banks) in the vicinity of the site.

Little information exists on the water quality in Refugio Creek. However, the Contra Costa Clean Water Program initiated a program to assess water bodies in Contra Costa County. As part of the program, Refugio Creek was sampled in April-April 2004 and 2005 for benthic macroinvertebrates and water quality (Contra Costa Clean Water Program 2004 and 2005). The 2004 report stated that the station nearest the project site was suboptimal with notable sedimentation. Specific conductance was 2,530 microsiemens per centimeter ($\mu\text{S}/\text{cm}$), pH was 8.1, and dissolved oxygen was 9.4 milligrams/liter. In 2005, the water quality was similar: specific conductance was $>1,990 \mu\text{S}/\text{cm}$, pH 8.1, and dissolved oxygen was 8.5 milligrams/liter. The macroinvertebrate community was characterized as moderately tolerant to pollution.

3.10.2.3 Floodplain Risk

The project site is within the 100-year flood zone identified by the Flood Insurance Rate Map (FIRM) for Contra Costa County, California, Map Number 06013C0043F effective June 16, 2009. A 0.2 percent chance of flood discharge (500-year flood) is contained in the three 72-inch culverts beneath the UPRR right-of-way that discharge into San Pablo Bay.

Refugio Creek is the main surface drainage within the City. Stormwater flooding of Refugio valley occurs during periods of heavy rainfall and runoff, coincident with high tides affecting Refugio Creek. A backwater effect is created that prevents effective flood water discharge to San Pablo Bay. Under current conditions, the UPRR tracks and the trestle bridge crossing of Refugio Creek constrict stormwater flows resulting in occasional overflows onto low lying areas along the south side of the tracks.

As part of the City's Creek Maintenance Program, man-made debris is removed at all choking points and culverts and excessive vegetation is cleared along Refugio Creek. The program is performed annually prior to the winter storm season.

3.10.2.4 Groundwater

The City lies within the San Francisco Bay HR. However, due to low elevations, proximity to San Pablo Bay, and the underlying bedrock, Hercules and the surrounding communities are not within a groundwater basin identified by the California Department of Water Resources (DWR 2003).

Groundwater underlies Refugio Valley at relatively shallow depths and is not a source of potable water. There are likely several distinct bearing zones in the bedded sediments in the valley, including a very shallow, but discontinuous perched zone. Throughout the lower valley, especially west of I-80, the winter water table is typically less than two to three feet deep, and declines to five to six feet during most summer months. Groundwater in the very shallow zone may be only six inches deep in the winter months of wet years. Refugio Creek is thus fed by

tides and surface water runoff during winter months and by groundwater discharge during the summer months (City of Hercules 1998b).

3.10.2.5 Sea Level Rise and Climate Adaptation

The State of California recognizes that climate change is already resulting in changes in sea levels, increased erosion and pressure on the state's infrastructure, water supplies and natural resources. Executive Order S-13-08, issued in November 2008, initiated development of the state's adaptation policy. The Executive Order required:

- ◆ The Agency to complete a California Sea Level Rise Assessment Report by December 1, 2010
- ◆ Prior to release of this Report, state agencies planning construction in vulnerable areas to analyze 2050 and 2100 sea level rise scenarios, and reduce risks and increase resiliency to sea level rise
- ◆ The Agency to coordinate preparation of a California Climate Adaptation Strategy by June 30, 2009 (this deadline has been extended)
- ◆ The Office of Planning and Research to provide state land use planning guidance related to sea level rise and other climate change impacts (the guidance had not been issued as of early August 2009)

In response to EO S-13-08, the Agency issued the 2009 California Climate Adaptation Strategy. Adaptation is a relatively new concept but essentially refers to the efforts that are utilized to respond to the impacts of climate change. Among the relevant strategies identified in the 2009 CCAS is:

- ◆ Consider project alternatives that avoid significant new development in areas that cannot be adequately protected from flooding due to climate change. State agencies should generally not plan or build any new significant structure in places requiring significant protection from sea-level rise, storm surges, or coastal erosion during the expected life of the structure. State agencies should incorporate this policy into their decisions, and other levels of government are encouraged to do so. Exceptions should be made for development with regionally significant values, and for in-fill development.
- ◆ Develop transportation design and engineering standards to minimize climate change risks to vulnerable transportation infrastructure.

Sea levels are anticipated to rise as much as 1.4 meters in the San Francisco Bay by 2100 and would put 33 percent or more of land at risk from flood-related inundation.

3.11 Geology and Soils

3.11.1 Regulatory Framework

This section briefly summarizes the regulatory requirements that govern proposed projects within the City, including those specifically affecting the Hercules ITC.

3.11.1.1 State

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act (PRC§2621 et seq.) (originally enacted in 1972) prohibits construction of most types of buildings intended for human occupancy across the traces of active faults and strictly regulates construction along active faults. The act is intended to reduce the hazard to life and property from surface fault ruptures during earthquakes; it is not directed toward other earthquake hazards.

Before a project can be permitted, cities and counties must require a geologic investigation to demonstrate that potential buildings will not be constructed across active faults. An evaluation and written report of a specific site must be prepared by a licensed geologist. If an active fault is found, a structure for human occupancy cannot be placed over the trace of the fault and must be set back from the fault (generally 50 feet).

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act of 1990 (PRC §§2690–2699.6) addresses non-surface fault rupture earthquake hazards, including liquefaction, strong ground shaking, and seismically induced landslides. Intended to reduce damage resulting from earthquakes, the Seismic Hazards Mapping Act contains provisions conceptually similar to those of the Alquist-Priolo Act. The State is responsible for identifying and mapping areas at risk of strong ground shaking, liquefaction, landslides, and other earthquake and geologic hazards, and affected cities and counties must regulate development in mapped seismic hazard zones. The Seismic Hazards Mapping Act allows the lead agency to withhold permits until geologic investigations are conducted and mitigation measures are incorporated into plans. The Seismic Hazards Mapping Act addresses not only seismically induced hazards but also expansive soils, settlement, and slope stability. The Seismic Hazards Mapping Act will be relevant to soil conditions at some future facility sites.

California Building Code

The California Building Code requires extensive geotechnical analysis and engineering for grading, foundations, retaining walls, and other structures, including criteria for seismic design. The Bay Area is located within Zone 4, which is expected to experience the greatest effects from earthquakes, and requires the most stringent requirements for seismic design. The proposed project must be designed according to the latest seismic design standards, and would be required to meet all relevant California Building Code requirements for seismic safety.

3.11.1.2 Local Regulations

City of Hercules General Plan

The General Plan of includes policies and implementing actions to ensure safety from seismic and geologic hazards. The following policies are relevant to the proposed project. The City conditions approval of individual development proposals on the following implementation programs.

- ◆ **Policy 2A.1.** For each proposal, require a feasibility study to determine whether any proposed critical facilities (emergency response centers, police stations, and hospitals) and schools could be sited in areas with lesser earthquake hazards. An alternative site feasibility assessment should include a consideration of sites in areas with lesser earthquake (and flood) hazards in addition to considerations of service area, accessibility, and economic considerations.
- ◆ **Policy 2B:** Projects proposed for all critical facilities including schools, high-population facilities (such as shopping malls) and industries using or generating significant amounts of hazardous materials within areas subject to very strong earthquake ground shaking or ground failure shall conduct geotechnical studies and structural design evaluations.
- ◆ **Program 2B.1:** If the alternative site feasibility study for a critical facility or school were to indicate that other less hazardous sites are not available for the critical facility, then geotechnical studies and structural design processes for the facility would be conducted in compliance with State of California requirements and recommendations of the Seismic Safety Commission. These should include detailed studies of the geologic materials at the site, seismic event response evaluations to identify design criteria, foundation design criteria, and dynamic method analyses of proposed structures.
- ◆ **Program 2B.2:** For the other types of facilities, the alternative site feasibility assessment would be an optional requirement of the City. A rigorous geotechnical evaluation and structural design process would be required to ensure that the proposed structures would perform in major earthquakes without creating a life safety hazard to occupants or people in surrounding areas.
- ◆ **Policy 2C:** The City will update an Earthquake Preparedness and Emergency Response Plan as necessary to establish emergency access points to evaluate the comprehensiveness of the City's evacuation routes in relation to the specific effects of seismic-induced ground shaking, liquefaction, and lurching within the community.
- ◆ **Policy 2D:** The administration of subdivision and grading ordinances shall allow for flexibility in the review and approval of construction plans to permit sound engineering design in the solution of specific geological problems. Site-specific geotechnical investigations shall be required for every new development.
- ◆ **Program 2D.1:** Applications for subdivision and development projects shall include site-specific geotechnical investigations prepared by a California-certified engineering geologist documenting the geotechnical suitability of the site for the proposed development based on soil and underlying substrate conditions; and the measures required to ensure public safety and protection of the

property. The following shall be implemented through adoption as conditions of approval for the project.

Loose or improperly compacted existing fills and backfills should be excavated from areas to be filled

- ▲ All areas to be graded should be stripped of vegetation and the top few inches of highly organic topsoil.
- ▲ Organic soil should be stripped and stockpiled and used for landscaping
- ▲ Lower valley areas where bay mud deposits are exposed or are blanketed by shallow thicknesses or poorly compacted fill will require detailed studies prior to site grading.
- ▲ Side hill “sliver” cuts and fills should be avoided.
- ▲ Special consideration should be given to slope stability in the steep hillside areas. Site new structures away from steep hillsides and the toes of existing landslide surfaces, reducing the potential for damage from landslide movement or burial.
- ▲ Steep side-slopes should be left in their natural condition where possible.
- ▲ Minimize the potential for creating new landslides or reactivating old ones. Set backs should be determined based on detailed soils investigations in individual cases opposite landslide prone slopes to reduce the potential for slide damage to improvements.
- ▲ Expansive soils should be considered in the design of road pavement sections.
- ▲ Site planning should consider the potential of different settlement where compressible soils exist, and employ appropriate approaches to reducing the hazard to an acceptable level of risk.
- ▲ Areas underlain by soft bay mud will require further detailed soil investigations.
- ▲ Slopes should be planted as soon as possible after completion of construction to develop a protective organic mat.
- ▲ Dense pockets of brush and trees located on steep slopes should be left intact where possible to prevent potential landslides.
- ▲ Development of the project sites should minimize the amount of native soils compacted by construction vehicles and structures, as well as the amount of soil disturbed through grading and excavation. As much as possible, native soils should be left undisturbed and used for open space and landscaping purposes.
- ▲ Development of the project sites should also maximize the use of pervious materials, including fill, and incorporate proper drainage structures capable of handling anticipated increases in surface runoff.

- ▲ Minimize amount of grading when building on hill sides. No grading should occur on slopes steeper than 30 percent, and cut slope angles no greater than 33 percent be maintained.
- ◆ **Program 2D.2:** Applications for subdivision and development projects shall include site-specific erosion control and hillside drainage plans, which shall address the following standards. These standards shall be implemented through adoption as conditions of approval for the project.
 - ▲ The use of silt fencing, sediment trapping basins, runoff diversion devices, and hydroseeding of barren slopes can minimize or prevent this impact.
 - ▲ Grading in the City should occur with no increase in discharge of sediments to wetlands, Refugio Creek, or San Pablo Bay.

3.11.2 Existing Conditions

3.11.2.1 Regional Geology

The City is located within the California Coast Ranges geomorphic province that parallels the boundary between two major tectonic plates – the Pacific and North American plates (City of Hercules 2009c), characterized by a series of northwest-trending valleys and mountain ridges (ENGEO 2009). Offshore areas to the north of the project are primarily shallow mud flats with vegetated wetland in the near-shore zone. The bedrock in this region has been folded and faulted in a tectonic setting that is experiencing translational and compressional deformations in the earth's crust (ENGEO 2009).

In this part of the Bay Area, the bedrock units include a series of Miocene-age marine sedimentary rocks ranging from about 5 to 20 millions years old (Graymer 1994 as cited in ENGEO 2009). These marine sedimentary bedrock units include: (1) the Cierbo sandstone; (2) the Briones formation; (3) the Rodeo shale; and (4) the Hambre Sandstone. A non-marine bedrock unit, the Montezuma Formation, is mapped in the western portion of the project area that is considered approximately 1 to 2 million years old (ENGEO 2009).

3.11.2.2 Recent Geologic History

San Francisco Bay is California's largest estuarine environment. Its configuration and the surrounding landscape have been shaped by a combination of tectonic activity, recent sea level changes, and human activities since 1850 (WTA 2003).

Since the formation of the Sacramento-San Joaquin drainage outlet through the Bay approximately 400,000 years ago, the environment of deposition has fluctuated between estuarine (periods of high sea level resulting from a warm global climate) and alluvial (periods of low sea level during periods of cold global climate) (Sloan 1992 as cited in WTA 2003).

The present Bay estuary formed less than 10,000 years ago as the global climate warmed and sea levels rose (WTA 2003). Marine water re-entered the Bay approximately 10,000 years ago and by about 4,000 years ago had reached its present level (WTA 2003). With the establishment of estuarine conditions, sedimentation in the Bay changed from alluvial sands

and silts to dark-colored estuarine clays and silts, commonly called Bay Mud. Deposition of sandier sediment was confined to channels (WTA 2003).

Since about 1850, human activities have made enormous modifications to the Bay, causing changes in the patterns of circulation and sedimentation. Between 1856 and about 1900, hydraulic mining in the Sierra foothills deposited several feet of sediment throughout the Bay (WTA 2003). Starting in the 1800s, the construction of levees and dykes altered the patterns of drainage and annual flooding in the Delta (WTA 2003). Also, the placement of fill at numerous localities around the Bay margins has dramatically altered the shoreline profile during historic time (WETA 2003).

3.11.2.3 Site Geology

The project site is located on the shoreline of the San Francisco Bay, at the mouth of Refugio Valley, extending from the intersection of Santa Fe Drive and Railroad Avenue to the northeastern extent of the Bio-Rad property in Hercules, California.

ENGEO (2009) reviewed historic aerial photos, topographic maps as well as literature of the project site and area. The review shows that much of the Refugio Valley was formerly an intertidal marsh. The natural channel of Refugio Creek meandered across the marsh and emptied into the Bay east of the existing channel. The review also shows that by the early 1900s, the intertidal marsh and overlying sand bar had been filled to the outboard of the UPRR ROW. The review of historic topography and aerial photos shows various generations of structures, tanks, rail spurs, and equipment that have since been removed and replaced with residential communities and live-work buildings. Sometime prior to 1939, a portion of Refugio Creek had become a straight channel with crossings within the industrial complex (ENGEO 2009).

The northeastern segment of the site adjacent to the Bio-Rad property consists of steep cut slopes and undulating hills and swales covered with natural vegetation (ENGEO 2009). Elevations range from approximately 10 feet at the existing railroad to as high as 40 feet upslope at the Bio-Rad facility. The land east of Refugio Creek just west of Bio-Rad has irregular topography due to fill placement and ranges in elevation from approximately seven feet to as high as 30 feet. The upper portions of the fill are part of an unfinished surcharge program to mitigate future settlement of compressible bay deposits in the area (ENGEO 2009).

To the west of the existing Refugio Creek in the location of the proposed Station structure, graded building pads extend along the north side of Bayfront Boulevard. An existing sanitary-sewer lift station is located near the proposed Station structure. The lift station would be relocated as part of the proposed project.

At the corner of Railroad Avenue and Bayfront Boulevard, there is a graded surcharge fill pad associated with the future Railroad Plaza. The temporary pad is located at about elevation 30 feet with 2:1 (horizontal:vertical) slopes extending down to surrounding grades. West of this area, site grades extend from an approximate elevation of eight to 10 feet at the railroad easement to an approximate elevation of 13 to 15 feet inland. The East Bay Regional Park trail

on the western project extent consists of a flat paved path at the base of a steeply sloping swale. High pressure fuel pipelines and fiber optic cables exist along the southern limit of the UPRR corridor (ENGEO 2009).

3.11.2.4 Geologic Units

The following descriptions of geologic units are summarized from ENGEO (2009).

Existing Fill (Qaf)

The majority of the project site has been impacted by previous grading and is covered with variable amounts of man-made fill. The existing fills have been subdivided into the fills placed on the Bio-Rad property, fills associated with the railroad, fills associated with the recent residential developments in the Refugio Valley, and fills associated with the historic Hercules Powder Company.

Biorad Fills (Qaf1)

The Bio-Rad property is located in the eastern portion of the project area. Fills on the Bio-Rad property include engineered fills that were placed in the 1980s in conjunction with the current land use, as well as older fills that were placed in conjunction with previous land uses. The fills placed in the 1980s were derived from on-site sources and were placed as engineered fill that was observed and tested by Berlogar Geotechnical Consultants.

An older fill area exists on the Bio-Rad property, upslope of Railroad Station 3072. This fill, derived from nearby sources, was placed over colluvial soil deposits in a former swale without construction of a keyway or subdrains. The fill material consists of silty clay with some rock fragments.

Railroad Fills (Qaf2)

The alignment of the existing railroad tracks and adjacent access road is underlain by fill that typically ranges from about three to eight feet thick. Across the Refugio Valley tidal marsh, the railroad bed was built up with a heterogeneous mixture of imported fill materials and capped with railroad ballast.

In the eastern and western portions of the project site, the railroad bed was created by cuts into the shoreline bluffs and placement of fills in the intertidal zone. In the northern portion of the project area, the cuts along the shoreline bluff range up to 40 feet high. Fills along these sections of the railroad to produce the level railroad grade and trench backfill associated with the existing underground utilities. The fills associated with the railroad are well compacted; however, there are no records available to document that the fills were placed in a manner that is consistent with current standards for engineered fills.

Hercules Powder Company Fills (Qaf3)

The history of grading activity associated with the Hercules Powder Company spans many years and appears to have involved many episodes of grading. Fills associated with the Hercules Powder Company have been identified on both the east and west sides of the existing railroad. Much of this older fill was derived from on-site cuts, but debris, such as timber, brick, and concrete. There is no documentation regarding these fills, and generally, these fills have not been placed in a manner that is consistent with current standards for engineered fill. Within the development areas, these fills were removed to the extent feasible and replaced as engineered fill prior to placement of the existing engineered fills.

Development Fills (Qaf4)

Various engineered fills, surcharge fills, and stockpiles have been placed on the south side of the railroad tracks in conjunction with grading for residential developments in the Refugio Valley. Most of this fill material has been derived from cuts on the adjacent hillsides or was imported under the review of the State Department of Toxic Substance Control (DTSC) as previously discussed. Within the limits of the current project area, the fills placed in conjunction with recent residential developments have been documented as engineered or surcharge-fill. Surcharge fills were placed with reduced compactive effort and moisture conditioning.

Young Bay Mud (Qb)

The Young Bay Mud deposits are marine estuarine deposits that range up to a maximum of about 40 feet thick within the project site. The Young Bay Mud typically consists of soft and highly compressible organic-rich clay with interbedded peaty deposits.

Sand Bar Deposits (Qsb)

Near the mouth of Refugio Creek, a silt and sand deposit was encountered in numerous borings that appears to be a sand bar deposit. In some borings, the sand bar deposits were encountered directly underlying existing fills, whereas in other borings, the sand bar deposits were covered within a thin layer of Bay Mud. Where encountered in borings, the sand bar deposits were found to be a maximum of about 15 feet thick. The sand bar deposits were found to be poorly graded and vary from fine to coarse grained. In some borings the sand bar deposits contained some silt or gravels. The sand bar deposits are typically medium dense to dense.

Older Bay Mud (Qob)

Underlying the Young Bay Mud, deposits are stiffer older marine sediments known as Old Bay Mud, which range from 20 to 70 feet thick. The Older Bay Mud consists predominantly of silty clay and contains only minor interbedded sandier beds, and varies from stiff to hard.

Colluvium (Qc)

Swales on the shoreline bluff are typically underlain by thicker accumulations of soil called colluviums. The colluvial deposits generally consist of stiff silty clay. The colluvial solids range up to 15 feet in thickness.

Landslide Debris (Qls)

Several landslide areas exist on the steep shoreline bluffs located in the eastern portion of the project site. It appears that the landslides have formed over the long term on the oversteepened cuts that were made to construct the existing railroad. Most of the landslides exhibit signs of recent activity including near-vertical head scarps that are bare of vegetation. The landslide deposits range up to about 10 feet thick.

Older Alluvium (Qoa)

Older alluvial deposits have been encountered in borings and exposed during grading on the northern side of the Refugio Valley. The older alluvial deposits generally consist of silty clay with variable amounts of sand and rock fragments. The older alluvium is typically stiff to very stiff.

Montezuma Formation (Qmz)

The Montezuma formation is a Pleistocene-age, non-marine sedimentary rock. The Montezuma formation was encountered on the eastern flank of the Refugio Valley and underlies a portion of the shoreline bluff on the Bio-Rad property. The Montezuma formation encountered consists of poorly indurated claystone, siltstone, and sandstone. This formation is typically weak and varies from thinly to thickly bedded.

3.11.2.5 Seismicity and Faults

The project site is located in a region that contains numerous active faults⁹ (ENGEO, 2009). The nearest known active fault is the Hayward Fault located about 3.5 miles southwest of the project site. The San Andreas Fault is located about 22 miles to the southwest, and the Concord Fault is located about 12 miles to the northeast. The Calaveras Fault is located about 18 miles to the southeast. Figure 3.11-1 shows the relationship of the project site to known active faults.

Estimates of the maximum earthquake magnitudes for each fault are based on those reported by the Working Group on Northern California Earthquake Potential (WGNCEP 1996).

San Gregorio Fault

The San Gregorio Fault is a major Holocene active fault that lies west of the San Andreas Fault. The fault is approximately 78 miles long, extending from the Big Sur area northward to the area offshore of Bolinas Bay. Most of the fault lies offshore; however, in several areas the fault lies

⁹ An active fault is defined by the State Mining and Geology Board as one that has had surface displacement within Holocene time (about the last 10,000 years)(Hart 1994 as cited in ENGEO 2009).

onshore and has been actively investigated (Simpson et al. 1992 as cited in City of Pittsburg 2006). The fault has an estimated Quaternary slip rate of 5 millimeters per year (mm/yr). Paleoseismic estimates of earthquake recurrence intervals on the fault range from 350 to 680 years based on offset archeological remains at Seal Cove (Simpson et al. 1992 as cited in City of Pittsburg 2006). The San Gregorio Fault is located approximately 35 miles from the project site, and the maximum earthquake magnitude for the fault is estimated to be approximately Moment Magnitude (M_w) 7.3.¹⁰

San Andreas Fault

The San Andreas Fault is the largest active fault in California, and extends from the Gulf of California on the south approximately 750 miles to Cape Mendocino on the north. It was the source of the 1906 M_w 7.9 San Francisco earthquake (Wallace 1990 as cited in California Energy Commission 2008), which ruptured approximately 280 miles of the fault from San Juan Batista to Shelter Cove. The fault is about 16 miles southwest of the project site at its closest approach.

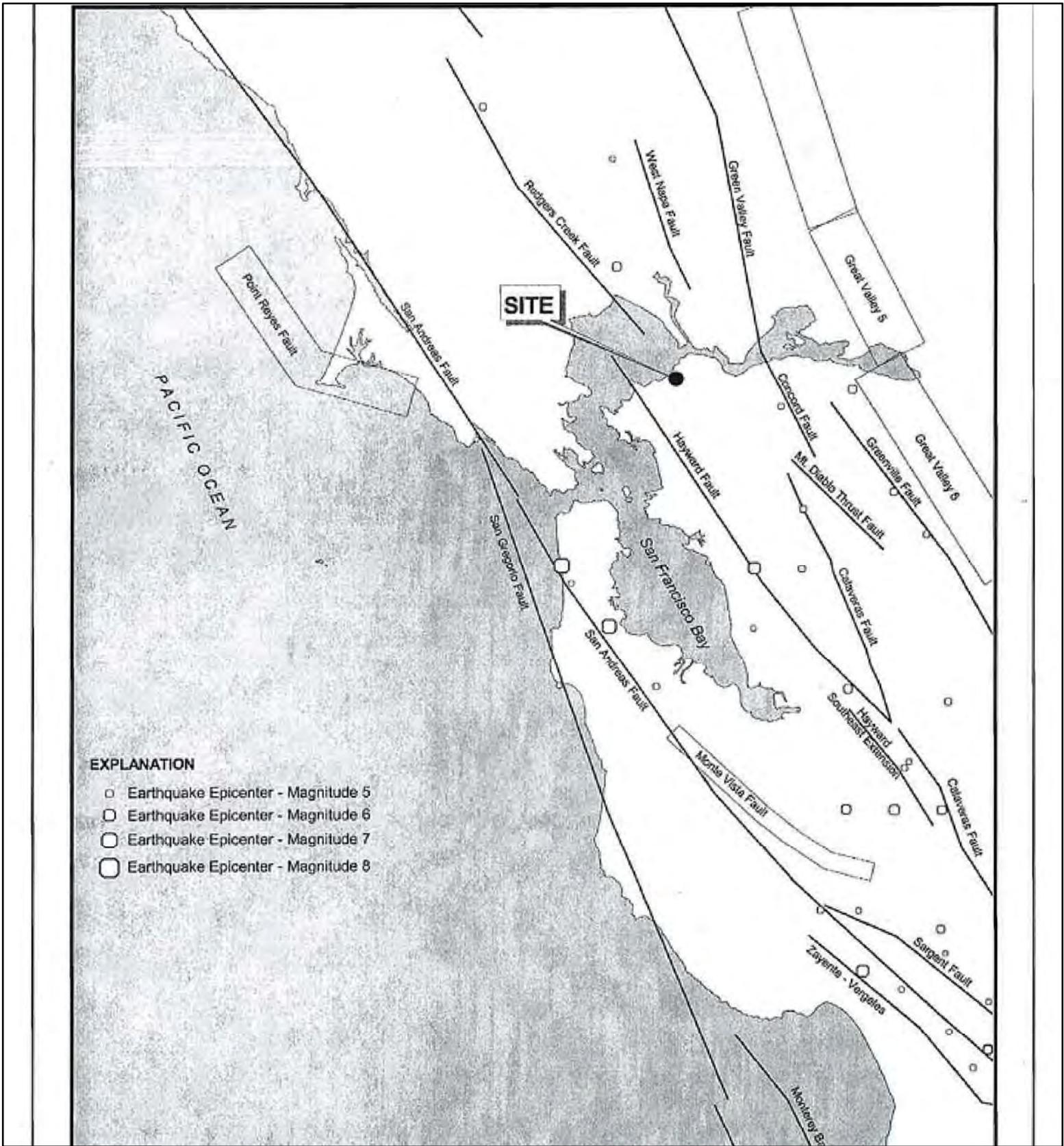
The San Andreas Fault can be divided into a number of segments, based on differences in geomorphology, geometry, paleoseismic chronology, seismicity, and historic displacements. In the Bay Area, these segments include the southern Santa Cruz Mountains, possible source of the 1989 M_w 7.0 Loma Prieta earthquake; the Peninsula segment; and the North Coast segment. These segments have been assigned maximum earthquakes of M_w 7, M_w 7.1, and M_w 7.9, respectively, by the WGNCEP (1996).

Hayward Fault

The Hayward Fault is about 62 miles long and has been divided into two fault segments: a longer southern segment, and a shorter northern segment. The fault demonstrates systematic right-lateral creep offset of cultural features along its entire length (Lienkaemper et al. 1991 as cited in California Energy Commission 2008). This structure is considered to be the most likely source of the next major earthquake in the Bay Area (WGNCEP 1996), and is located approximately three miles east of the project site.

The Local Magnitude (M_L) 6.8 event in October 1868 was the last major earthquake on the Hayward Fault, and occurred along the southern segment near Fremont. (M_L is based on the measurement of the earthquake from a distance of 100 kilometers from the epicenter.) WGNCEP (1996) has assigned maximum earthquakes of M_w 6.9 for both the northern and southern segments of the Hayward Fault.

¹⁰ M_w is based on the amount of energy released by the earthquake

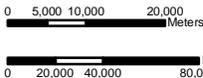


EXPLANATION

- Earthquake Epicenter - Magnitude 5
- Earthquake Epicenter - Magnitude 6
- Earthquake Epicenter - Magnitude 7
- Earthquake Epicenter - Magnitude 8



1 in = 80,000 ft (at letter layout)



City of Hercules
Hercules Intermodal Transit Facility
Contra Costa County, California

Data Sources: Map information was compiled from the best available sources. No Warranty is made for its accuracy or completeness. Topographic Base Map, Aerial photography from ESRI ArcGIS Online; Hydrography from National Hydrography Dataset; NWI Data from U.S. Fish and Wildlife Service and soils data from USDA NRCS Soil Survey. Data is State Plane Feet NAD83 Zone 3.

Figure 3.11-1 Regional Faulting and Seismicity



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Rodgers Creek Fault

The Rodgers Creek Fault is a 38-mile-long northwest-striking, right-lateral strike-slip fault that extends northward from the projection of the Hayward Fault on the south side of San Pablo Bay. The Rodgers Creek Fault has a long-term geological slip rate similar to the Hayward Fault, and produced a large-magnitude historical earthquake in the late 1800s. Paleoseismic investigations by Schwartz et al. (1992 as cited in California Energy Commission 2008) identified evidence for three earthquakes in the last 925 to 1,000 years, yielding a preferred earthquake recurrence interval of 230 years for an earthquake of M_w 7.0. The fault is about five miles to the north of the project site at its closest approach.

Concord-Green Valley Fault Zone

The Concord-Green Valley Fault is a northwest-striking, right-lateral strike-slip fault zone that extends from the Walnut Creek area across Suisun Bay and continues to the north. The Concord Fault extends for approximately 12 miles, from the northern slopes of Mount Diablo to Suisun Bay. North of Suisun Bay, the Green Valley Fault continues to the north for about 28 miles (City of Pittsburg 2006). The Concord Fault is an actively creeping structure that has a long-term creep rate of approximately five millimeters per year (mm/yr) (California Energy Commission 2008).

It is estimated that rupture of both faults would produce a maximum earthquake of about M_w 6.9, with a recurrence interval of approximately 180 years (WGNCEP 1996). At its closest point, the Concord Fault is approximately 22 miles from the project site.

Greenville-Marsh Creek Fault

The Greenville-Marsh Creek Fault is a northwest-striking strike-slip fault of the San Andreas system in the northern Diablo Range, extending from Bear Valley to the east side of Mt. Diablo. This fault has a lower slip rate than other structures within the San Andreas system, with a long-term rate of approximately 1 to 3 mm/yr. This fault produced a moderate-magnitude earthquake in 1980 (City of Pittsburg 2006).

Research is currently being conducted on the fault zone to better constrain its slip rate and its history of past earthquakes. The WGNCEP (1996) assigned a maximum earthquake of M_w 6.9 to the Greenville Fault; the recurrence interval is estimated to be about 550 years. The fault is located approximately 36 miles east of the project site.

3.11.2.6 Seismic Hazards

Potential seismic hazards resulting for a nearby moderate to major earthquake can generally be classified as primary and secondary. The primary effect is ground rupture, also called surface faulting. Common secondary seismic hazards include ground shaking, ground lurching, soil liquefaction, lateral spreading landslides, tsunamis, and seiches. The following seismic hazard descriptions and references therein come directly from ENGEO (2009) and City of Hercules (2009c).

Ground Shaking

An earthquake of moderate to high magnitude generated within the San Francisco Bay Region could cause considerable ground shaking at the project site. The degree of shaking is dependent on the magnitude of the event, the distance to its epicenter, local geologic conditions, and how the earthquake waves decrease or attenuate as they travel from their sources to the site in question. The Bay Area has experienced a number of large, damaging earthquakes during historical time (WTA 2003). Future strong ground shaking from nearby large-magnitude earthquakes is a virtual certainty. Seismic criteria would vary across the project site based on the wide range of soils encountered and the differing nature of site improvements.

Liquefaction

Liquefaction is a phenomenon in which saturated cohesionless soils are subject to a temporary loss of shear strength because of pore pressure build-up under the cyclic shear stresses associated with earthquakes. Soils most susceptible to liquefaction are generally loose, clean, saturated, uniformly graded, fine-grained sand and silt of low plasticity with a low percentage of fine-grained clay particles. Liquefaction typically occurs in areas where groundwater is shallow, and materials consist of clean, poorly consolidated, fine sands. The project site has been mapped within a State of California Liquefaction Hazard Zone, which calls for evaluation of the liquefaction hazard. In addition, in June 2007, the site was mapped by the Association of Bay Area Governments as an area that may have a high susceptibility to liquefaction.

Lateral Spreading

Lateral spreading is a failure within weak soils, typically due to liquefaction, which causes the soil mass to move toward an open channel, or down a gentle slope. Medium dense sand was found within the area of the former sand bar. The occurrence and magnitude of lateral spreading is evaluated based on the density of the sand, as measured by Cone Penetration Test (CPT) and Standard Penetration Test (SPT) results that are corrected for fines content. Based on the CPT, SPT, and fines content results; the sand bar soils are expected to experience some strength loss in response to cyclic ground motions associated with earthquake shaking. However, lateral displacement of the gently sloping shoreline extending into the project area is expected to be limited due to the limiting shear strains associated with the sand density of the sand (Idriss and Boulanger, 2008), as indicated by the CPT and SPT results.

Three different methods have been used to evaluate slope deformations (Youd et al. 2002; Bray and Travasarou 2007; ENGEO 2009). Each method yielded a predicted deformation of approximately eight inches. Due to the numerous uncertainties in this type of analysis, Bray and Travasarou (2007) recommend considering a range of four to 16 inches. Deformation of the magnitude predicted for the proposed project is considered to be small to moderate (ENGEO 2009).

Lateral spreading of larger magnitude may occur along the free face slopes associated with the existing shoreline and Refugio Creek. Deep foundation elements located in proximity to these

slopes may experience additional kinematic lateral loading due to slope deformation unless ground improvement measures are implemented to strengthen the slopes.

Fault Rupture

No known active faults have been mapped within the project area, and the project site does not lie within a delineated State of California Earthquake Fault Zone; therefore, the potential for ground rupture is considered low.

Landslides

Several landslide areas have been mapped on the shoreline bluff in the northern portion of the project area. Most of these landslides exhibit signs of recent activity and, in general, the potential for continued movement is considered high. Preliminary project plans suggest that substantial portions of these landslides would be removed by the cuts that would be needed to construct the new track alignment, maintenance road, and trail.

Subsidence

Another potential seismic hazard is that of earthquake-induced subsidence or settlement. Buildings constructed on compressible sediment may be subject to differential settlement of soils during an earthquake, depending on the distribution of the building weight, the type of condition of the underlying sediment, and the intensity or style of ground shaking experienced at the site. Primary areas of concern regarding differential settlement include the Bay Mud present near San Francisco Bay and other areas of deep sediment deposits, as well as areas of poorly engineered fill. In addition, areas underlain by estuarine sediments, organic rubbish, or thick organic deposits may also be moderately to highly susceptible to subsidence. Settlement is discussed under liquefaction, above.

3.11.3 Mineral Resources

No significant mineral deposits have been identified by the California Department of Conservation, Division of Mines and Geology for the Hercules Area (City of Hercules 2009c). However, Hercules does have areas that have been identified as containing mineral deposits with a significance that cannot be evaluated from available data known as “MRZ-3 zones”.

MRZ-3 zones have been mapped for the hills to the north and south of SR-4, east of I-80, and the hilly area north of John Muir Parkway to the west of I-80 in the general vicinity of the Hill Town site. However, according to the General Plan, there is no information to suggest that these areas have extractable minerals of commercial value such that existing and planned land uses would reduce their benefit to the community and region (City of Hercules 1998a).

3.12 Hazardous Materials

This section provides an overview of the presence of hazardous materials within the project area, the potential for impacts during construction activities for the proposed project, and the regulatory setting applicable to environmental protection and health and safety. Issues related to public health and safety includes the transport, use, and storage of hazardous materials and disposal of hazardous wastes.

A material is considered hazardous if it appears on a list of hazardous materials prepared by a federal, state, or local agency, or if it has characteristics defined as hazardous by such an agency. Factors that influence the health effects of exposure to hazardous material include the dose to which the person is exposed, the frequency of exposure, the exposure pathway, and individual susceptibility.

The California Code of Regulations (CCR) defines a hazardous material as a substance that, because of physical or chemical properties, quantity, concentration, or other characteristics, may either: (1) cause an increase in mortality or an increase in serious, irreversible, or incapacitating, illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of, or otherwise managed. Hazardous wastes are defined in a similar manner. Hazardous wastes are hazardous materials that no longer have practical use, such as substances that have been discarded, discharged, spilled, contaminated, or are being stored prior to proper disposal.

This section describes the existing hazards and hazardous materials conditions in and near the project area. This includes the regulatory setting and the results of environmental database records searches conducted for the project area. Regulations governing the project area originate at both the Federal and State level, but many are implemented and enforced at the local or regional level. Most hazardous materials regulation and enforcement in Contra Costa County is managed by the Health Services, Hazardous Materials Program.

3.12.1 Regulatory Framework

Hazardous materials and health and safety are subject to numerous laws and regulations at federal, state, and local levels of government. Summaries of the applicable laws and regulations related to hazardous materials management are presented below.

3.12.1.1 Federal Regulations

Federal regulatory agencies include the USEPA, the OSHA, and the Department of Transportation (DOT). The following represent federal laws and guidelines governing hazardous substances.

- ◆ Pollution Prevention Act (42 United States Code (USC) 13101 et seq./40 Code of Federal Regulations (CFR))
- ◆ Clean Water Act (33 USC 1251 et seq./40 CFR)
- ◆ Oil Pollution Act (33 USC 2701-2761/30, 33, 40, 46, 49 CFR)

- ◆ Clean Air Act (42 USC 7401 et seq./40 CFR)
- ◆ Occupational Safety and Health Act (29 USC 651 et seq./29 CFR)
- ◆ Federal Insecticide, Fungicide, and Rodenticide Act (7 USC 136 et seq./40 CFR)
- ◆ Comprehensive Environmental Response Compensation and Liability Act (42 USC 9601 et seq./29, 40 CFR)
- ◆ Superfund Amendments and Reauthorization Act Title III (42 USC 9601 et seq./29, 40 CFR)
- ◆ Resource Conservation and Recovery Act (42 USC 6901 et seq./40 CFR)
- ◆ Safe Drinking Water Act (42 USC 300f et seq./40 CFR)
- ◆ Toxic Substances Control Act (15 USC 2601 et seq./40 CFR)

At the federal level, the principal agency regulating the generation, transport and disposal of hazardous substances is the USEPA, under the authority of Resource Conservation and Recovery Act (RCRA) of 1976. The RCRA established a federal hazardous substance regulatory program that is administered by the USEPA, which regulates the generation, transportation, treatment, storage and disposal of hazardous substances. Under RCRA, individual states may implement their own hazardous substance management programs as long as they are consistent with, and at least as strict as, RCRA.

The USEPA regulates hazardous substance sites under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, commonly referred to as Superfund. The purpose of CERCLA was to provide authorities with the ability to respond to uncontrolled releases of hazardous substances from inactive hazardous waste sites that endanger public health and the environment.

The OSHA is the agency responsible for ensuring worker safety, and sets federal standards for implementation of training in the work place, exposure limits, and safety procedures in the handling of hazardous substances (as well as other hazards). OSHA also establishes criteria by which each state can implement its own health and safety program.

The DOT regulates the interstate transport of hazardous materials and wastes through implementation of the Hazardous Materials Transportation Act. This act specifies driver-training requirements, load labeling procedures, and container design and safety specifications. Transporters of hazardous wastes must also meet the requirements of additional statutes such as RCRA.

3.12.1.2 State Regulations

The California Environmental Protection Agency (Cal/EPA) and Office of Emergency Services (OES) establish rules governing the use of hazardous substances. The Cal/EPA was created in 1991 to better coordinate state environmental programs, reduce administrative duplication, and address the greatest environmental and health risks. The Cal/EPA unifies the state's environmental authority under a single accountable, cabinet-level agency. Cal/EPA oversees the following agencies: Air Resources Board (ARB), Integrated Waste Management Board,

Department of Pesticide Regulation, State Water Resource Control Board (SWRCB), Department of Toxic Substances Control (DTSC), and Office of Environmental Health Hazard Assessment.

The following represent state laws and guidelines governing hazardous substances:

- ◆ Porter Cologne Water Quality Control Act (California Water Code Section 13000–14076/23 CCR)
- ◆ California Accidental Release Prevention Law (California Health and Safety Code Section 25531 et seq./19 CCR)
- ◆ California Building Code (California Health and Safety Code Section 18901 et seq./24 CCR)
- ◆ California Fire Code (California Health and Safety Code Section 13000 et seq./19 CCR)
- ◆ California Occupational Safety and Health Act (California Labor Code Section 6300–6718/ 8 CCR)
- ◆ Hazardous Materials Handling and Emergency Response “Waters Bill” (California Health and Safety Code Section 25500 et seq./19 CCR)
- ◆ Hazardous Waste Control Law (HWCL) (California Health and Safety Code Section 25100 et seq./22 CCR)
- ◆ Carpenter-Presley-Tanner Hazardous Substance Account Act “State Superfund” (California Health and Safety Code Section 25300 et seq./California Revenue and Tax Code Section 43001 et seq.)
- ◆ Hazardous Substances Act (California Health and Safety Code Section 108100 et seq.)
- ◆ Safe Drinking Water and Toxic Enforcement Act “Proposition 65” (California Health and Safety Code Sections 25180.7, 25189.5, 25192, 25249.5-25249.13/8, 22 CCR)
- ◆ California Air Quality Laws (California Health and Safety Code Section 39000 et seq./17 CCR)
- ◆ Aboveground Petroleum Storage Act (California Health and Safety Code Section 25270 et seq.)
- ◆ Pesticide Contamination Prevention Act (California Food and Agriculture Code Section 13141 et seq./3 CCR)
- ◆ Underground Storage Tank Law “Sher Bill” (California Health and Safety Code Section 25280 et seq./23 CCR)

The California OSHA (Cal/OSHA) assumes primary responsibility for developing and enforcing work place safety regulations within the State. Cal/OSHA regulations concerning the use of hazardous substances include requirements for safety training, availability of safety equipment, hazardous substance exposure warnings, and emergency action and fire prevention plan preparation.

California law requires that hazardous waste be transported by a state-registered hazardous waste transporter that meets specific registration requirements. State agencies with primary

responsibility for enforcing federal and state regulations, and responding to hazardous materials transportation emergencies are the California Highway Patrol and Caltrans.

3.12.1.3 Local Regulations

City of Hercules

The City developed a Hazardous Waste Management Plan (HWMP) as an element of the General Plan (City of Hercules 1990). The City's HWMP was prepared to be consistent with the goals, objectives, and basic content of the County's HWMP, but to also meet the specific needs of the City. The overall goals of the HWMP are: to achieve the safe and effective management of hazardous waste within the City of Hercules, and to protect the health and safety of the public and the environment. Relevant Hercules City HWMP objectives regarding hazardous materials include:

- ◆ Accept responsibility and develop appropriate planning for the safe and responsible treatment and transfer or disposal of wastes within the city jurisdiction or in coordination with other jurisdictions.
- ◆ Designate prevention of deterioration of public health or the environment caused by hazardous waste as a primary goal of the city government.
- ◆ Adopt policies and targets which restrict further increases in and seek reductions in the volume and toxicity of hazardous waste committed to land disposal.
- ◆ Oppose increases of hazardous waste treatment, storage or disposal within the city limits unless such activities are consistent with this Plan, and laws and ordinances of the City of Hercules.
- ◆ Encourage recycling, reuse and on-site treatment as second priorities for hazardous waste management techniques.
- ◆ Provide strong direction and support to actively enforce laws, regulations and ordinances concerning issuance of permits, inspection, compliance and data availability concerning the generation, storage, transportation, treatment and disposal of hazardous waste or the generation, storage and transportation of hazardous materials.

3.12.2 Records Review

The objective of the records review is to obtain and review records that will help identify recognized environmental conditions at or potentially affecting the proposed project sites. Publicly available federal, state, and local regulatory agency records were reviewed for the proposed project. Environmental Data Resources, Inc. (EDR), a data-search firm, performed a search of all federal, state, local, and tribal databases for the proposed project site and surrounding area. A copy of the report entitled The EDR Radius Map Report with GeoCheck dated December 1, 2009, is included in Appendix H (EDR 2009). The results of the search are also summarized below, including the description and number of listings discovered within the defined search radius. The search radius distances for each database searched are based on the minimum distances established by the American Society for Testing and Materials (ASTM) and commonly used for environmental site assessments. Definitions and detailed descriptions

of each database, and the standard search distance for each are included in the EDR report in Appendix H.

The following descriptions summarize the information reviewed in the federal, state, local, and tribal databases. The proposed project site is included on the following state databases: Hist Cal-Sites, Response, EnviroStor, and CA Bond Exp Plan. However, as described above, the proposed project site has been certified by the DTSC as having been remediated satisfactorily.

A description of the surrounding facilities that have been identified within the search radius is also provided below.

- ◆ Hist Cal-Sites: Formerly known as ASPIS, this database contains both known and potential hazardous substance sites. The source of the database is the DTSC; however, this database is no longer updated and has been replaced by the EnviroStor database. Including the proposed project site (2 listings), an additional two Hist Cal-Sites listings were identified in the database search: Bio-Rad Laboratories and Centex Homes of California. The Bio-Rad Laboratories site is located adjacent to and northeast of the proposed project site. As with the proposed project site, Bio-Rad Laboratories is also located on portions of the former Hercules Powder Works site. However, the Bio-Rad Laboratories site has been certified by the DTSC as having been remediated satisfactorily. The Centex Homes of California site is located over ½-mile from the proposed project site, and has also been certified by the DTSC as having been remediated satisfactorily. Based on information provided in the EDR report for these Hist Cal-Sites properties, no significant impact to the proposed project site is anticipated from these properties.
- ◆ Response: The Response database identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk. Including the proposed project site (2 listings), an additional two Response listings were identified in the database search: Bio-Rad Laboratories and Centex Homes of California. As described above, these sites have been certified by the DTSC as having been remediated satisfactorily. Based on information provided in the EDR report for these Response properties, no significant impact to the proposed project site is anticipated from these properties.
- ◆ EnviroStor: The DTSC's Site Mitigation and Brownfields Reuse Program database identifies sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites; State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in Cal-Sites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites. Including the proposed project site (2 listings), an additional three EnviroStor listings were identified in the database search: Bio-Rad Laboratories, Centex Homes of California, and Gelsar. As described above, these sites, with the exception of Gelsar, have been certified by the DTSC as having been remediated satisfactorily. The Gelsar site is located over ½

mile from the proposed project site, and was under a voluntary cleanup agreement which was completed in 2002 and certified in 2003. Based on information provided in the EDR report for these EnviroStor properties, no significant impact to the proposed project site is anticipated from these properties.

- ◆ CA Bond Exp Plan: The California Bond Expenditure Plan was developed by the Department of Health Services as a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. Two CA Bond Exp Plan listings were identified in the database search, both representing the proposed project site.

Orphan sites are those with incomplete address information and which could not be plotted. There were six properties identified on the Orphan Summary. Based on information provided in the report for the listed properties, their general locations, and the databases on which the properties were listed, no significant impact to the proposed project site is expected from these properties.

An environmental site assessment was prepared for portions of the proposed project in 2007 (ENGE0 2007). The results of this site assessment were also reviewed for the purpose of confirming site history and database search details.

3.12.3 Existing Conditions

Portions of the proposed project site are located within the site of the former 1,300-acre Hercules Powder Works facility. Operations at the Hercules Powder Works facility began in the 1880's with the production of explosives, and continued until the mid 1960's with the manufacture of dynamite, black powder, and nitroglycerin. During the 1960's, focus shifted from production of explosives to production of fertilizer products, and also non-fertilizer products such as rocket fuel propellant. In 1976 Hercules Properties, Inc. purchased three parcels totaling 167 acres, which included a portion of the proposed project site. All chemical manufacturing at the facility was ceased by 1977, and the site remained vacant until 1985, at which time the DTSC issued an order to the previous landowners to remove machinery, debris, and materials from the site. Testing performed at that time showed that soil, groundwater, and sediments contained hazardous levels of the heavy metals and chemicals that were used to manufacture the explosives and fertilizers. DTSC split the site into a two major Operable Units (OUs), OU-A and OU-B. OU-A consisted of the site soils and was further subdivided into six sub-OUs (OU-1 through OU-6). OU-B consisted of Refugio Creek, bay sediments, and site groundwater and was further subdivided into two sub-OUs (OU-7 and OU-8).

Under DTSC oversight, remediation of the site included removal of contaminated soil and sediments through excavation and off-site disposal. Remediation of OU-A was completed in 1997, and all sub-OUs were remediated to residential standards with the exception of OU-3 (Hercules Point), which has a deed restriction (a Covenant to Restrict Use of Property filed with Contra Costa County Recorder's Office) that restricts this parcel to only industrial or commercial land uses. Other uses are not allowed without DTSC approval. DTSC conducts annual inspections of OU-3 to ensure that the OU continues to be protective of public health, safety, and the environment. Based on the results of toxicity studies, OU-7, OU-8, and site

groundwater were approved for no further action in 1994, with 5-year reviews to be conducted for the metals in groundwater.

3.13 Utilities

This section describes the existing public utilities and service systems that would support the proposed Hercules ITC. This section evaluates the utility service systems such as the electrical power, natural gas, water supply and distribution system; wastewater collection, conveyance, and treatment systems; solid waste services; and telecommunications services. The providers of these utility services are regulated under the authority of the California Public Utilities Commission (CPUC). Information presented in the discussion and analysis presented below was drawn from consultation with local utility providers and from the City of Hercules (2009b) Updated Redevelopment Plan EIR and the WTA (2003) Program EIR.

3.13.1 Regulatory Framework

3.13.1.1 Federal Energy Regulations

Regulations for transportation energy consumption are generally directed toward fuel efficiency of motor vehicles. The federal Energy Policy and Conservation Act of 1992 established fuel economy standards for on-road vehicles in the U.S. This law places responsibility to the National Highway Traffic and Safety Administration (a part of the US DOT) for establishing vehicle standards and for revising existing standards. The USEPA administers the Corporate Average Fuel Economy (CAFE) program, which determines vehicle manufacturers' compliance with existing fuel economy standards. The "California Greenhouse Bill" (AB 1493) signed into law in July 2002 is intended to reduce production of "greenhouse gases," and its implementation may also result in use of more energy-efficient vehicles.

NEPA requires that a discussion of the potential energy impacts of a proposed project be addressed, with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy.

3.13.1.2 State Energy Regulations

Urban Water Management Planning Act

California State AB 797 (California Water Code Section 10610, et seq.), adopted in 1983, requires every urban water supplier providing water for municipal purposes to more than 3,000 customers or more than 3,000 acre-feet of water on an annual basis to prepare an Urban Water Management Plan (UWMP). The intent of the UWMP is to assist water supply agencies in water resource planning given their existing and anticipated future demands. UWMPs must be updated every five years in years ending in the numbers of zero and five.

Senate Bill 610

Senate Bill (SB) 610 requires that projects that would be supplied with water from a public water system that identifies groundwater as a source prepare a specified water supply assessment (WSA). These assessments must be furnished to local governments for inclusion in any environmental documentation for certain projects (as defined in Water Code 10912[a]). This legislation also expands the requirements for certain types of information in a UWMP, including an identification of any existing water supply entitlements, water rights, or water

service contracts held relevant to the water supply assessment for a proposed project, and a description of water deliveries received in prior years.

Under Sections 10910–10915 of the California Water Code, a WSA is required by law for any development that meets the following thresholds:

1. A proposed residential development of more than 500 dwelling units.
2. A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space.
3. A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space.
4. A proposed hotel or motel, or both, having more than 500 rooms.
5. A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area.
6. A mixed-use project that includes one or more of the projects specified in this subdivision.
7. A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500-dwelling-unit project.

The proposed project does not meet with any of these thresholds.

Senate Bill 221

Senate Bill (SB) 221 prohibits approval of subdivisions consisting of more than 500 dwelling units unless there is verification of sufficient water supplies for the project from the applicable water supplier(s). This requirement also applies to increases of ten percent or more of service connections for public water systems with fewer than 500 service connections. The law defines criteria for determining "sufficient water supply," such as using normal, single-dry, and multiple-dry year hydrology and identifying the amount of water that the supplier can reasonably rely on to meet existing and future planned uses. The proposed project does not fall within the criteria established under SB 221.

Title 24

Buildings constructed after June 30, 1977, must comply with standards identified in Title 24 of the California Code of Regulations. Title 24 requires the inclusion of state-of-the-art energy conservation features in building design and construction, including the incorporation of specific energy-conserving design features, use of non-depletable energy resources, or a demonstration that buildings would comply with a designated energy budget.

California Integrated Waste Management Act

As many of the landfills in the state are approaching capacity and finding a location for new landfills becomes increasingly difficult, the need for source reduction, recycling, and composting has become apparent. In response to this increasing solid waste problem, in September 1989 the State Assembly passed AB 939, the California Integrated Waste Management Act. The act required every city and county in the state to prepare a Source Reduction and Recycling Element (SRRE) with its Solid Waste Management Plan that identifies how each jurisdiction will meet the mandatory state waste diversion goals of 25 percent by the year 1995 and 50 percent by the year 2000. Senate Bill 2202 mandates that jurisdictions continue 50 percent diversion on and after January 1, 2000. The purpose of AB 939 is to facilitate the reduction, recycling, and reuse of solid waste to the greatest extent possible. Noncompliance with the goals and timelines set forth within AB 939 can be severe, as the bill imposes fines of up to \$10,000 per day on cities and counties not meeting these recycling and planning goals. The 2004 diversion rate for the City was 53 percent, which complies with the goals specified in AB 939.

3.13.1.3 Local Policies and Ordinances

The City's General Plan contains goals and policies regarding public services, utilities, and services systems. The following General Plan policies are relevant to the proposed project.

Land Use Element

Policy 9A: Development applications shall be reviewed to determine if adequate solid waste disposal capacity exists to serve the project and that the project includes adequate recycling facilities.

Open Space and Conservation Plan

Policy 7b: Ensure that the new development pays its share of the costs associated with the provision of facilities to conform to the East Bay Municipal Utilities District (EBMUD) requirements for water conservation by attaching project-specific mitigation requirements as conditions of approval.

Policy 8a: The City shall ensure that new development pays its share of the incremental capacity costs associated with the provision of wastewater treatment facilities by attaching project-specific mitigation as conditions of approval.

3.13.2 Existing Conditions

3.13.2.1 Water Supply

The City receives potable water service from the EBMUD. In 2005, EBMUD delivered an average flow of 210 million gallons per day (mgd) serving over 325,000 service accounts.

EBMUD draws its primary supply of water (approximately 90 percent) from the Mokelumne River in the Sierra Nevada Mountain Range. EBMUD delivers its water supply through a

system of reservoirs, aqueducts, water treatment plants, pumping plants, and distribution facilities. The City of Hercules is served by the 22.3-million-gallon Maloney Reservoir located in the City of Pinole. Based on current projections of the UWMP, the Mokelumne watershed is of sufficient size to meet the near term water needs of the EBMUD and the City, including the proposed project area.

EBMUD Urban Water Management Plan

An urban water management plan (UWMP) is required for every urban water supplier providing more than 3,000 acre-feet of municipal water annually or providing water to more than 3,000 customers (see the Regulatory Environment discussion below). On November 26, 1985, EBMUD adopted its first UWMP. Since 1985 the plan has been revised and updated every five years. The most recent UWMP was adopted on November 22, 2005, by the EBMUD Board of Directors; the UWMP is a long-range planning document that reports on the current and projected water usage, water supply programs, and conservation and recycling programs. The 2005 UWMP summarizes EBMUD's demand and supply projections in five-year increments for a 25-year planning horizon (through 2030), and reflects the latest actual and forecast values. The UWMP presents water supply and availability, including the underlying assumptions, as derived from EBMUD's hydrologic model. It also contains planned upgrades to the water system to ensure that appropriate future levels of service are met.

EBMUD's water demand projections account for anticipated future water demands within the service boundaries of EBMUD, and for variations in demand attributed to changes in development patterns. The demand projections indicate both densification and land use changes in all existing land use classifications, thus increasing the overall demand. The UWMP projects water demand over time, accounting for estimated variations in demand usage less conservation and recycled supply sources. For planning purposes, the demands are estimated in five-year increments, but it is recognized that actual incremental amounts would occur in shorter increments as new users come on line. Periodically, EBMUD updates the demand projections to reconcile these variations, and the UWMP is updated as appropriate at each five-year cycle.

Demand Projections

Water consumption within the EBMUD service area has remained relatively stable in recent years in spite of population growth. Since the 1970s, water demand has ranged from 200 to 220 mgd in non-drought years. EBMUD has water rights permits and licenses that allow for delivery of up to a maximum 325 mgd from the Mokelumne River, subject to the availability of Mokelumne River runoff and the senior water rights of other users.

Supplemental Water Supply and Demand Management

The goals for meeting EBMUD projected water needs in the service area and increased water reliability rely on three components: supplemental supply, water conservation, and recycled water. The UWMP describes EBMUD's supplemental water supply project alternatives to meet

its long-term water demand as well as supplemental water projects, including the development of groundwater storage within EBMUD's service area.

3.13.2.2 Wastewater Services

Wastewater in the proposed project area is collected primarily by sewer lines owned and maintained by the City. The collected wastewater is treated at the Pinole/Hercules Wastewater Treatment Plant, which serves the City and the City of Pinole and is operated by the Pinole-Hercules Wastewater Joint Powers Authority (JPA). The treatment plant is located on Tennent Avenue in the City of Pinole. The collection system includes separate domestic and industrial sewers and related pumping facilities. Untreated wastewater is piped to the City's treatment plant through pipes, using both gravity flow and lift stations where appropriate. The Pinole/Hercules Wastewater Treatment Plant has the capacity to treat 4.06 mgd. The City of Hercules has implemented a wastewater-sampling program, including the implementation of a confined space entry program, to comply with OSHA regulations. In addition, the Cities of Pinole and Hercules are in the process of upgrading and planning future plant capacity).

The EBMUD's Urban Water Management Plan (UWMP) 2005 projects that in 2010 (i.e., project build-out year) the amount of collected and treated wastewater demand would be 3.6 mgd; therefore, it is anticipated by the UWMP 2005 that the Pinole/Hercules Wastewater Treatment Plant would have sufficient capacity to serve the city.

3.13.2.3 Stormwater

Storm water within the City of Hercules flows by way of sheet flow or the municipal storm drain system into creeks and then into the Bay without treatment. Stormwater from the project site flows by sheet flow into ditches and depressions along the UPRR rail line, from which it drains to Refugio Creek, or directly into Refugio Creek or the Bay. The nearest municipal storm drain inlet and drainage lines are in Bayfront Boulevard, adjacent to the project site.

3.13.2.4 Solid Waste

Richmond Sanitation is the solid waste service provider for the City. The City's solid waste is disposed of at the Potrero Hills Landfill, which is approximately 28.5 miles northeast of the City. The Potrero Hills Landfill opened in 1986 and owns 1,400 acres of property with 190 acres of waste area to date. The facility receives an average of 3,400 tons of fill daily.

3.13.2.5 Electrical Power and Natural Gas

Electricity is provided and distributed in the City by Pacific Gas and Electric (PG&E) and by the Hercules Municipal Utility (HMU). HMU would supply electricity to the proposed project area. Natural gas is also provided and distributed to the project site by PG&E.

Other underground utilities that cross the site include two privately held petroleum transport pipelines that will be relocated during construction. These lines run parallel and within the UPRR right-of-way.

3.13.2.6 Telecommunications

Telecommunications service in the City of Hercules is provided by AT&T. Existing telecommunications infrastructure on and around the project site include underground telephone and fiber optic lines along nearby roadways and along the UPRR rail line that runs through the project site.

3.14 Public Services

This section evaluates the environmental effects associated with any improvements required to meet increases in demand for public services, including fire protection, police, and schools as a result of implementation of the proposed Hercules ITC project.

3.14.1 Regulatory Framework

3.14.1.1 Local Plans and Policies

City of Hercules General Plan

The Safety Element and Open Space/Conservation Element of the General Plan include objectives, policies, and programs related to public services, including fire protection services and park and recreation services. Objectives, policies, and programs most applicable to the project are listed below.

Safety Element

Objective 1: Consider potential seismic, geologic, flood and fire hazards and introduce adequate safety measures in development plans and proposals.

Program 1A.4: An Emergency Operations Plan has been prepared and should be maintained to provide responsibilities and procedures in the event of a major disaster or emergency in the City. This plan is compatible with the State of California and the Office of Emergency Services. The Emergency Operations Plan designates emergency evacuation routes.

Objective 3: Ensure that adequate fire protection is provided throughout the city and that all new structures conform to current fire safety standards.

Policy 3A: The City should continually evaluate the alternatives for providing adequate fire service to meet the changing needs of the City in the most efficient manner.

Program 3A.1: The City shall assist the Rodeo-Hercules Fire Protection District in processing the collection of fire impact fees from all new development within the City.

Program 3A.2: The City shall work with the Rodeo-Hercules Fire Protection District to determine specific needs for fire protection when a particular development proposal is reviewed and ensure that these needs are met. Fire Stations shall be located in the City so that five minutes emergency response time may be achieved by first response unit for 90 percent of all emergency calls. Fire Stations shall be sized to accommodate a minimum of two engines/trucks and three-person 24-hour crews.

Policy 3B: New development shall be designed to minimize exposure to fire hazards.

Program 3B.1: Subdivision and planned development plan applications shall include measures to promote fire safety. These measures shall be evaluated during application review and implemented through adoption as conditions of approval for the project including:

1. Road circulation for fire access.
2. Access to structures and open spaces.
3. Fire flow needs and other peakload water flow needs for emergencies.
4. Landscape design.

Program 3B.2: Subdivision and planned development plan applications shall include open spaces measures to promote fire safety. These measures shall be evaluated during application review and implemented through adoption as conditions of approval for the project including:

5. A buffer of irrigated landscaping and/or plowed area maintained between open spaces and developed areas.
6. Fire access trails in major open spaces to allow fire equipment to penetrate. These trails should be part of the City-wide system of trails.
7. The use of fire resistant plant materials in open space landscaping.
8. Containment of potential fires where natural vegetation exists in open spaces.
9. Responsibilities for maintenance of fire trails, cleaning vegetated areas and maintaining fire breaks should be clearly defined in planned development and conditions of approval.

Open Space/Conservation Element

Policy 3a: Design of building footprints along any riparian corridors shall be outside the CDFG- and/or COE-pre-approved buffer zone. Sensitive riparian habitats shall be marked by a qualified biologist to deter any destruction by equipment during construction.

Program 3a-1: Prior to construction in areas of riparian corridors or wetlands, the City shall support CDFG and USACE permitting process. A Streambed Alteration Agreement from CDFG and/or a Section 404 USACE permit shall be obtained by the project applicant prior to any development within any creek or discharge of fill into any creek.

Program 3a-2: Development along any riparian corridor shall incorporate measures to avoid impacts during construction, including:

10. Construction of any access bridge shall be limited to the bridge footprint area only.
11. Parking of large equipment shall be on the upland grassland area or on the paved street. Construction workers cars shall have designated parking areas.
12. Basins for oil leaks from the equipment shall be installed if equipment is parked onsite over night.

Policy 4a: The City shall require project proponents to design facilities to prevent degradation of riparian and wetland communities from urban pollutants in storm runoff.

Program 4a-1: To minimize pollution downstream from sedimentation, the City shall require installation of sedimentation and grease basins in the storm drain system in parking lots in accordance with NPDES regulations and shall require that property owners maintain the basins annually, or as required by NPDES regulations. Parking lots shall be swept periodically to decrease the amount of debris that could potentially contaminate the riparian or wetland habitat.

Policy 5a: The City shall review development proposals for consistency with minimizing impacts to salt marsh zones. Buildings shall be located on existing developed or graded areas, where practicable.

Policy 5b: The City shall work with CDFG, BCDC, EBRPD, and the USACE to determine appropriate buffer zones along the bay to protect tidal habitat when designing a Bay access trail linkage between Pinole and Rodeo. Public access and pedestrian pathways shall be limited within the buffer zone, and when possible, located along the edges of the buffer zone. Bicycles shall be encouraged to stay on bike paths through the use of signage and fencing.

Land Use

Policy IA: Encourage and only allow development that is consistent with the Land Use Diagram, Land Use Categories; and objectives, policies and programs of the Land Use Element. Procedures to evaluate development applications for consistency with the Land Use Diagram, Land Use Categories; and objectives, policies and programs of the Land Use Element shall be incorporated into the application review procedures of the Zoning Ordinance. Applications shall also be evaluated in relation to the capacity of infrastructure and schools to serve the proposed development.

3.14.2 Existing Conditions

3.14.2.1 Fire Protection

The Rodeo-Hercules Fire District (RHFD) serves the proposed project site location. It is an autonomous fire district within Contra Costa County serving the City of Hercules and the unincorporated Town of Rodeo. The RHFD is a full-service fire department that employs a total of 21 full-time personnel and up to 20 reserve personnel and covers an area approximately 25 square miles. The RHFD serves a population of approximately 33,000 and responds to over 2,200 calls per year. The current average response time for emergencies is 6.4 minutes. The response time goal for the district is 5 minutes, 90 percent of the time. Responsibilities of the RHFD include:

- ◆ Responding to and providing fire/rescue services for all areas located within the City's boundaries;
- ◆ Providing all Emergency Medical Services (EMS), including Advanced Life Support (ALS) and Basic Life Support (BLS), to all areas located within the City's boundaries;
- ◆ Hazardous Material response and mitigation in all areas located with the City's boundaries;
- ◆ Urban Search and Technical rescues in all areas located within the City's boundaries;

- ◆ Planning and preparing for all contingencies in the event of disaster;
- ◆ Maintaining automatic aid and mutual aid with local cities, counties, and the state;
- ◆ All Fire Prevention inspection programs and public education; or all fire investigation.

The RHFD operates two fire stations: Rodeo Fire Station 75 (located at 326 Third Street, Rodeo) and Hercules Fire Station 76 (located at 1680 Refugio Valley Road, Hercules). The RHFD list of fire service equipment includes one 75-foot ladder quint, two type-one engines, two type-three engines, one medium rescue unit, one utility truck, and four staff vehicles.

The RHFD is also a participating agency within Battalion 7, which includes the two Rodeo-Hercules fire stations, two City of Pinole fire stations, and two Contra Costa County fire stations. The RHFD has an automatic aid agreement with the City of Pinole Fire Department as well, and has extensive resources available through mutual aid. Fire Station 73 in Pinole also serves the project area. The 2007 budget was \$4.9 million to serve a population of 33,000 people.

The RHFD employs 40 full-time and part-time staff, including one chief, one battalion chief, six captains, two engineer/paramedics, four engineers, six firefighter/paramedics, one administrative secretary, and 19 reserves. The RHFD does not provide transport of patients and the hazardous materials team is not fully equipped. The Contra Costa County Hazardous Materials Response Team (HMRT) provided by the Contra Costa County Health Department serves as the primary hazardous materials unit for the City. The San Ramon Fire HMRT and the Richmond Fire Department HMRT also provide backup to the RHFD upon request.

3.14.2.2 Law Enforcement

The City of Hercules Police Department (HPD) provides primary law enforcement and public safety services within the city. The HPD serves the proposed project site. The HPD is a full-service police department that provides general police protection, law enforcement, traffic enforcement, and all associated duties to the City of Hercules. The HPD currently employs 29.5 personnel including 29 sworn officers, two part-time parking enforcement officers, one police assistant, one full-time office assistant, one part-time office assistant, and one administrative secretary. The HPD is authorized to have 32 sworn officers for a population of approximately 25,000 and is recruiting to fill three vacancies. The ratio of sworn personnel to population is 1.2 per 1,000 residents. Currently, the HPD has ten patrol cars, three motorcycles, a special response team van, and six unmarked vehicles. The average response time to emergency and non-emergency calls in Hercules is five to seven minutes, and is consistent with HPD's goals. The Hercules Police Department is located at 111 Civic Drive in Hercules, approximately two miles from the project site. Services available at the HPD office include obtaining and filing police reports, fingerprinting, and general services. The HPD offices are open from 8:00 AM to 5:00 PM Monday through Friday, although police officers are on duty 24 hours a day.

The Pinole Police Department provides backup services to the City of Hercules through a mutual aid agreement, in addition to protection services to the City of Pinole and surrounding

communities. The Pinole Police Department is located at 880 Tennent Avenue, Pinole. Backup police services are also provided by the Contra Costa County Sheriff's Department.

3.14.2.3 Schools

The proposed project site is located within the West Contra Costa Unified School District (WCCUSD). WCCUSD covers 65 square miles and is one of seven unified school districts in Contra Costa County. WCCUSD serves 235,000 residents in the Cities of El Cerrito, Hercules, Pinole, Richmond, and San Pablo, and the unincorporated areas of Bay View–Montalvin Manor, East Richmond Heights, El Sobrante, Kensington, North Richmond, and Tara Hills. WCCUSD provides public education for kindergarten through 12th grade. The WCCUSD employs 1,763 employees, including 1,630 teachers, 128 pupil services staff (including counselors, librarians, psychologists, nurses, and speech/language/hearing specialists), and 135 administrators (including principals, vice and assistant principals, and district-level administrators). The WCCUSD administers 18 preschools, 38 elementary schools, one K–8 school, seven middle schools, six comprehensive high schools, ten alternative schools, 60 adult education sites, and nine operation sites serving over 31,500 students. Four WCCUSD schools are located within the proximity of the Sycamore Crossing and Hill Town sites: Hanna Ranch Elementary School, Lupine Hills Elementary School, Ohlone Elementary School, and the Hercules Middle-High School.

3.14.2.4 Public Libraries

The Hercules Public Library is located at 109 Civic Drive, at the corner of Civic Drive and Sycamore Avenue and it is open 45 hours a week. The Hercules Library is under the jurisdiction of the Contra Costa County Library (CCCL). The Hercules Library is the 24th CCCL-operated library. CCCL provides library service to all Contra Costa County cities except Richmond. CCCL also operates branches in unincorporated areas such as Crockett, El Sobrante, and Rodeo.

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