

2.0 PROJECT DESCRIPTION

1 As discussed in Section 1.0, Introduction, this Environmental Impact Report examines the
2 potential environmental impacts associated with the Amorco Marine Oil Terminal Lease
3 Consideration Project (Project). Section 2.0 provides a detailed description of the
4 proposed Project, including: Project overview, Project location, existing Project
5 components and operations, inspection and maintenance activities, and emergency
6 response procedures. Alternative projects considered, factors used in the selection of
7 those alternatives, and projects understood to have potential cumulative impacts are
8 presented in Section 3.0, Alternatives and Cumulative Projects.

9 2.1 PROJECT OVERVIEW AND LEASE HISTORY

10 Tesoro Refining and Marketing Company, LLC (Tesoro) has applied to the California
11 State Lands Commission (CSLC) for a new 30-year lease of sovereign land to allow
12 Tesoro to continue operations at the Amorco Marine Oil Terminal (Amorco Terminal). The
13 Amorco Terminal is primarily used to facilitate the transfer of crude oil feedstocks from
14 tanker vessels to Tesoro's Amorco Tank Farm (Tank Farm) immediately upland; the
15 feedstocks are later transferred via pipelines from the Tank Farm to the Golden Eagle
16 Refinery (Refinery), located approximately 2.5 miles east of the Amorco Terminal.¹ The
17 vicinity and location of the Amorco Terminal, Tank Farm, and Refinery are shown on
18 Figure 2-1 and Figure 2-2.

19 The current Tesoro lease agreement (Lease No. PRC 3453.1, a General Lease –
20 Industrial Use) was authorized by the CSLC with a 25-year term beginning in 1984.
21 Tesoro has operated under the “holdover” provisions of the lease since its expiration on
22 December 31, 2008. (i.e., the Amorco Terminal continues to operate under the terms of
23 Lease PRC 3453.1 until the CSLC either terminates the current lease or authorizes the
24 issuance of a new lease).

25 2.2 PROJECT LOCATION

26 2.2.1 Local Setting

27 The Amorco Terminal is located in the Carquinez Strait, approximately 0.25 mile west of
28 the Benicia-Martinez Bridge, in the city of Martinez, Contra Costa County (see Figure
29 2-1). The Amorco Terminal currently operates on 16.6 acres of sovereign land leased
30 from the CSLC, which will be reduced to 14.9 acres under the new 30-year lease
31 proposed as part of the Project. Tesoro's associated Tank Farm, located approximately
32 0.3 mile south of the Amorco Terminal on 35.7 acres of Tesoro-owned property, is used

¹ The Refinery is served by Tesoro's Amorco and Avon Marine Oil Terminals. The Tank Farm, Refinery, and Avon Marine Oil Terminal are not part of the Amorco Terminal lease. Refinery operations are addressed here only as they pertain to Amorco Terminal import operations. The Avon Marine Oil Terminal has a separate CSLC lease (Lease No. PRC 3454).

1 to store product. The Tank Farm consists of five crude oil feedstock storage tanks with a
2 combined capacity of 425,000 barrels, two firewater tanks with a combined capacity of
3 48,000 barrels, and associated pumps and pipelines connecting the Amorco Terminal,
4 Tank Farm, and Refinery. Vehicular access to the facility is via Amorco Road, which
5 connects to Marina Vista Road.

6 Tesoro's Golden Eagle Refinery is located approximately 2.5 miles east of the Amorco
7 Terminal and Tank Farm on approximately 2,000 acres of Tesoro-owned property.
8 Pipelines that connect the Tank Farm to the Refinery traverse the Pacheco Slough
9 Pipeline Bridge, which is part of Tesoro's Amorco Wharf lease agreement (PRC 3453.1).
10 The Refinery contains petroleum refining operating units, storage tanks, associated
11 pumps and pipelines, rail spurs, loading racks, and administration and warehousing
12 buildings. The Refinery typically receives approximately 150,000 barrels per day (bpd) of
13 crude oil import from waterborne and land-based sources.

14 **2.2.2 Regional Setting**

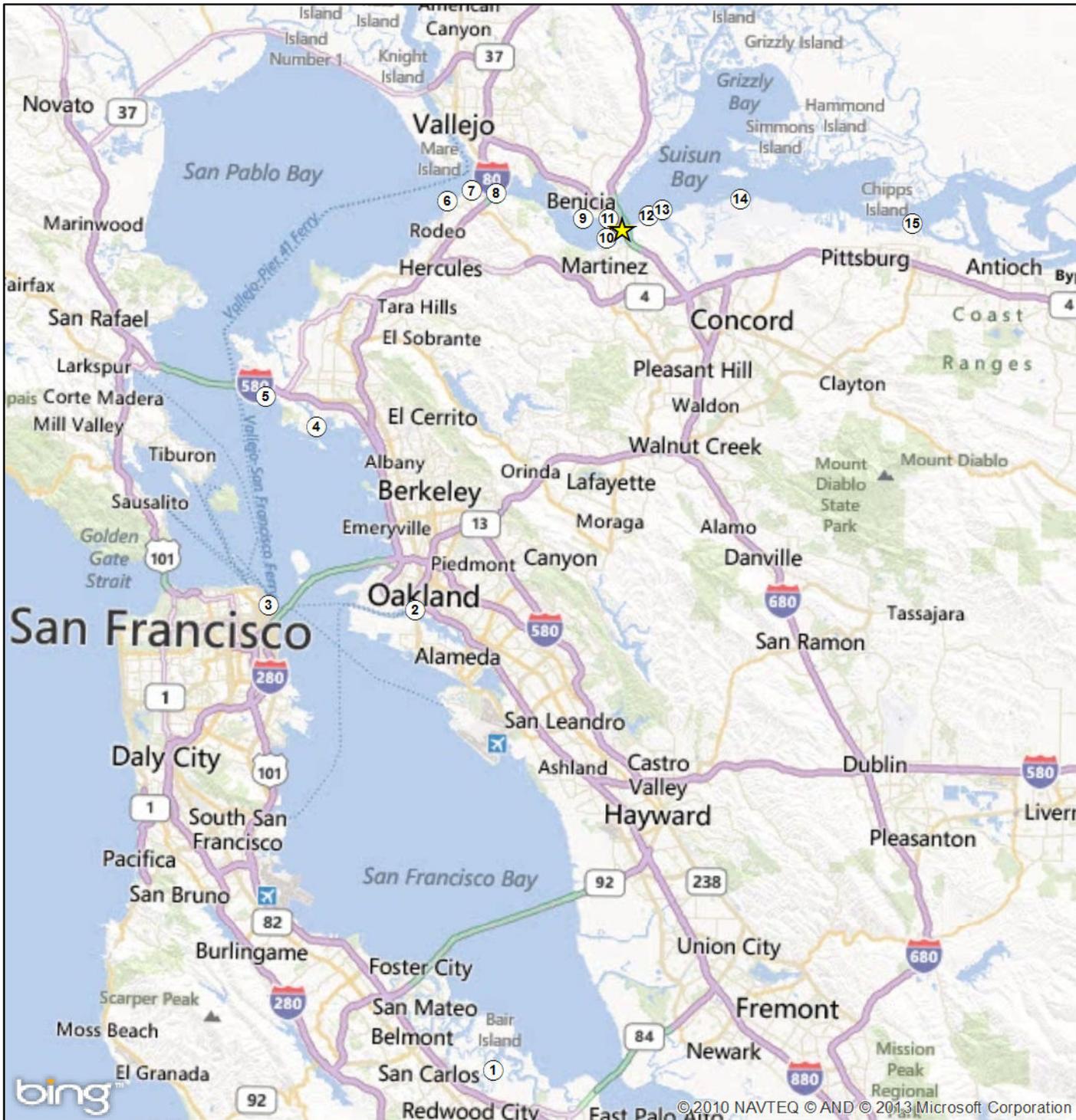
15 Five of California's 13 gasoline-producing refineries are located in the San Francisco Bay
16 Area (Bay Area) (CARB 2009). In addition to the Golden Eagle Refinery, these refineries
17 include (see Figure 2-1):

- 18 • Shell Oil Products U.S. Martinez Refinery (Shell) in Martinez;
- 19 • Valero Benicia Refinery (Valero) in Benicia;
- 20 • Phillips 66 San Francisco Refinery (Phillips 66) in Rodeo; and
- 21 • Chevron U.S.A. Inc. Richmond Refinery (Chevron) in Richmond.

22 These refineries generally run combinations of foreign, Alaskan North Slope, and some
23 San Joaquin Valley (SJV) crudes, and all have associated marine oil terminals. In addition
24 to receipt and shipment via tankers, oils are transported to Bay Area refineries via
25 pipelines, including the following:

- 26 • The Tesoro, Shell, Valero, and Phillips 66 Refineries have pipeline connections to
27 the Plains Product Terminals, LLC (formerly Shore) marine oil terminal and
28 petroleum bulk storage facility in Martinez.
- 29 • The Shell-owned pipeline from the SJV, a heated, proprietary system, supplies
30 San Joaquin Valley Heavy (SJVH) crude to the Phillips 66, Valero, and Shell
31 Refineries.

Figure 2-1 Project Overview
 California State Lands Commission
 Amorco Marine Oil Terminal
 Lease Consideration Project



- ★ Amorco Terminal Location
- Major Bay Area Terminals
- 1 Port of Redwood City
- 2 Port of Oakland
- 3 Port of San Francisco
- 4 Port of Richmond
- 5 Chevron Long Wharf
- 6 ConocoPhillips Rodeo
- 7 Shore Selby
- 8 C&H Sugar
- 9 Port of Benicia
- 10 Shell, Martinez
- 11 Valero, Benicia
- 12 Pacific Atlantic
- 13 Tesoro, Avon
- 14 Military Ocean Terminal Concord
- 15 PG&E Pittsburg

1 inch = 6 miles

1:400,000



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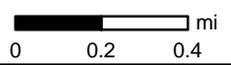
Figure 2-2 Project Location
 California State Lands Commission
 Amorco Marine Oil Terminal Lease Consideration Project

- CSLC Lease Boundary
- Amorco Tank Farm



1:28,000

1 in = 2,333 ft



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- 1 • The Phillips 66 Oleum Pipeline connects Phillips 66's facility in Santa Maria, which
2 processes local heavy crude, including oil from the outer continental shelf and
3 SJVH crude, to the Phillips 66 Rodeo refinery.
- 4 • Chevron Pipeline Company operates a common-carrier line importing SJV crude
5 to the Bay Area, with pipeline connections serving the Tesoro, Phillips 66, Shell,
6 and Chevron refineries.

7 In addition to these five refineries, there are eight ports 14 marine oil terminals, and
8 numerous other terminal facilities in the Bay Area. For discussion purposes, the marine
9 oil terminals are grouped into five geographic areas, as described below.

10 For more information regarding regional characteristics of crude oil and other
11 hydrocarbon products in the San Francisco Bay and along coastal shipping lanes off
12 northern California, including inbound and outbound vessel traffic, see Section 3.4.3.

13 **Carquinez Strait and Further Inland**

14 Two terminals, Phillips 66 Rodeo Marine Terminal and Shore Marine Oil Terminal (also
15 known as NuStar or Selby Marine Terminal), lie west of the Carquinez Bridge in San
16 Pablo Bay. In addition to the Amorco Terminal, marine oil terminals that lie inland, east of
17 the Carquinez Bridge include: Shell Martinez, Plains Product Terminals, LLC, and Tesoro
18 Avon Marine Oil Terminals in Martinez and Valero Benicia Terminal in Benicia.

19 **Port of Richmond Area**

20 Facilities in the Port of Richmond area are located in two areas: Richmond Inner Harbor
21 (including the 38-foot-deep Harbor Channel and the Santa Fe Channel), and the
22 Richmond area northwest of the Port. The Port of Richmond encompasses five city-
23 owned terminals and 10 privately owned terminals for handling bulk liquids, dry bulk
24 materials, metals, vehicles, and break-bulk² cargoes (City of Richmond 2013). The private
25 marine oil terminals include the following:

- 26 • Richmond Harbor Channel: Phillips 66 Richmond, Kinder Morgan Richmond, and
27 BP West Coast Products Richmond Marine Terminals; and
- 28 • Santa Fe Channel: Plains Richmond Terminal, International-Matex Tank
29 Terminals, and BP Lubricants Terminal.

30 In addition, at Point Richmond, just south of the Richmond-San Rafael Bridge but north
31 of the Port of Richmond, is the Chevron Long Wharf Marine Oil Terminal, which serves
32 the Chevron Refinery in Richmond.

² General cargo that must be loaded individually (i.e., not in intermodal containers or in bulk).

1 **Port of San Francisco**

2 The Port of San Francisco's (Port) marine facilities typically handle cargo,³ rolling stock,⁴
3 and break-bulk commodities; there are no marine oil terminals in the Port. The Port
4 operates six deep-water berths, five gantry cranes, and has on-dock rail service
5 capabilities (Port of San Francisco 2013).

6 **Port of Oakland/Oakland Area**

7 The Port of Oakland, the fifth busiest seaport in the nation, was established in 1927. There
8 are no marine oil terminals in the Port of Oakland. The Port of Oakland occupies miles of
9 waterfront on the eastern shore of San Francisco Bay, with 665 acres devoted to maritime
10 activities and another 3,000 acres devoted to aviation activities. Since 1962, 1,210 acres
11 of marine terminals, an intermodal rail facility, and maritime support areas have been
12 constructed. Activities launched through the port's Vision 2000 Program have included
13 the development of two new maritime terminals, a new intermodal rail facility, deepening
14 channels and berths (dredging) from -42 feet to -50 feet, and a new public park and wildlife
15 habitat. Oakland's 20 deep-water berths and 35 container cranes are supported by a
16 network of local roads and interstate freeways, warehouses, and intermodal rail yards.
17 The Oakland area also supports numerous other terminal facilities not strictly within the
18 Port of Oakland, but considered a part of the Oakland area. These include additional
19 container terminals and a variety of large and small recreational craft harbors.

20 The former Oakland Army Base (OAB), consisting of 368 acres, is also located in the
21 Oakland Harbor area, and was shuttered by the Base Realignment and Closure
22 Commission in 1993 and transferred to the city of Oakland and Port of Oakland from 2003
23 to 2006. In April 2011, the city of Oakland led a joint planning effort along with the port for
24 a master-planned development of both the port and city-owned OAB lands. The plans
25 include a new intermodal rail terminal, a new bulk marine terminal, 30 acres of truck
26 parking and service areas, 2 million square feet of new warehousing space, and a new
27 recycling center (Port of Oakland 2013).

28 **Port of Redwood City**

29 The Port of Redwood City has no marine oil terminals and primarily handles cargo, liquid
30 bulk, and dry bulk commodities for firms located near the port. The port is also a U.S.
31 Coast Guard (USCG)-certified oil waste reception facility. Facilities include five wharves
32 (Port of Redwood City 2010).

³ Large shipments of varied cargo destined for one location and/or one specific project.

⁴ Vehicles that move on a railway (e.g., railroad cars, coaches and locomotives).

1 2.3 PROJECT COMPONENTS

2 2.3.1 Marine Oil Terminal Configuration

3 The Amorco Terminal currently operates as an import-only facility for crude oil, although
4 it has the capability to export crude oil or other heavy petroleum products (and in the past
5 has been used in this capacity). The facility allows waterborne vessels to berth and moor,
6 and supports the required equipment to transfer product, namely crude oil, between
7 vessels and onshore storage tanks, otherwise known as unloading. Crude oil is generally
8 a petroleum refinery feedstock that is extracted from underground sources and is
9 minimally treated to reduce water content to merchantable grade, which is typically less
10 than 3 percent water.

11 Amorco Wharf

12 While in the past the Amorco Terminal has supported multiple active berths, the existing
13 Amorco Terminal is a single-berth docking facility supporting one active berth (located on
14 the eastern end of the wharf). The wharf supports associated unloading equipment,
15 including pumps, pipelines, electrical utilities, fire protection equipment, spill response
16 equipment, and other mechanical equipment. The main docking facility is approximately
17 1,130 feet long by 150 feet wide. It is made up of 21 dolphins that are interconnected with
18 walkways and/or continuous decking and two oil containment boom reel platforms,
19 located at the far eastern and western ends of the Amorco Terminal (see Figure 2-3).

20 Dolphins

21 Dolphins are discrete marine structures that are typically supported by piles founded in
22 soils. Dolphins are typically installed to provide working platforms or fixing points to attach
23 fenders, mooring devices, and other equipment. The primary function of mooring dolphins
24 is to support various mooring devices such as quick-release hooks and bollards that are
25 used to secure vessel mooring lines. The primary function of breasting dolphins is to
26 support fendering equipment that absorbs the energy from the berthing vessel and resists
27 the breasting forces while the vessel is moored at the terminal. Breasting dolphins are
28 often equipped with mooring hardware for spring lines. Table 2-1 includes a summary of
29 dolphins at the Amorco Wharf, including a description of piles and each dolphin's primary
30 function (see Figure 2-3).

1

Table 2-1: Amorco Terminal Dolphins

Dolphin Number(s)	Pile Description (No of Piles, Pile Diameter, and Material)	Primary Function
A32, A33, A35, A36, A68, A69, A74, A75	<ul style="list-style-type: none"> • 331, 16-inch, timber • 13, 24-inch, steel 	Provide pedestrian access between adjacent structures
A-34	<ul style="list-style-type: none"> • 113, 16-inch, timber • 4, 24-inch, steel • 6, 36-inch, steel 	Supports offshore firewater pump and emergency backup generator; also serves as a turnaround area for vehicles
A70, A73	<ul style="list-style-type: none"> • 88, 16-inch, timber • 3, 24-inch, steel 	Support elevated fire monitors and foam tanks
A-71	<ul style="list-style-type: none"> • 85, 16-inch, timber • 32, 24-inch, steel 	Used for main transfer operations; supports unloading hoses, main piping manifold, and the building hosting the Amorco Terminal Person-in-Charge
A72	<ul style="list-style-type: none"> • 52, 16-inch, timber • 4, 20-inch, steel • 1, 24-inch, steel 	Supports aluminum gangway structure that provides access to and from vessels
A-76, A-77, A-80	<ul style="list-style-type: none"> • 45, 24-inch, steel • 18, 36-inch, steel • 72, 20-inch, concrete (square) • 14, 14-inch, steel (H-pile) 	Breasting and mooring dolphins that support fender system components and double quick-release hooks
A78, A79, A81, A82, A83	<ul style="list-style-type: none"> • 20, 16-inch, timber • 52, 20-inch, steel • 44, 20-inch, concrete (square) • 14, 14-inch, steel (H-pile) 	Mooring dolphins

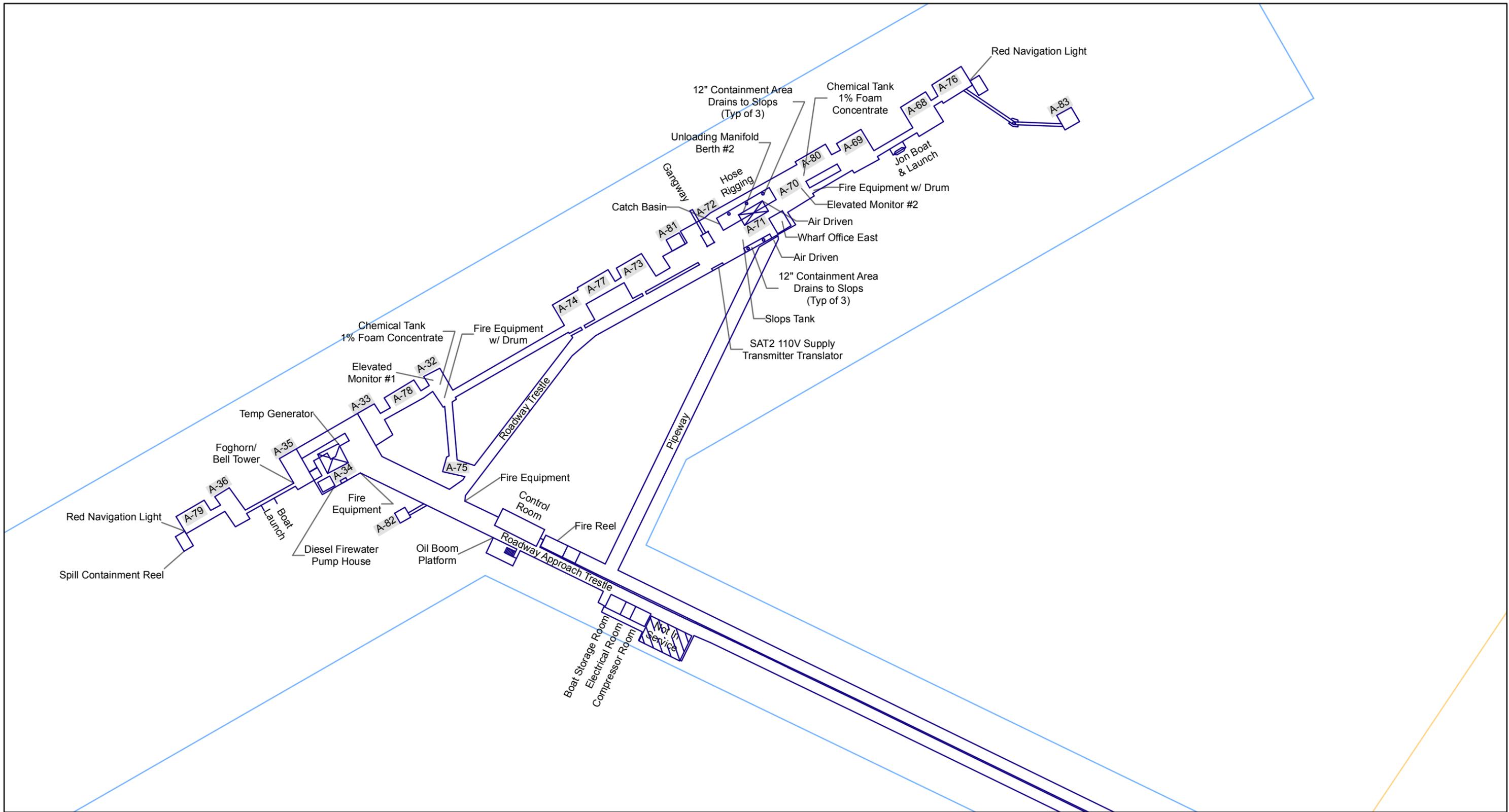
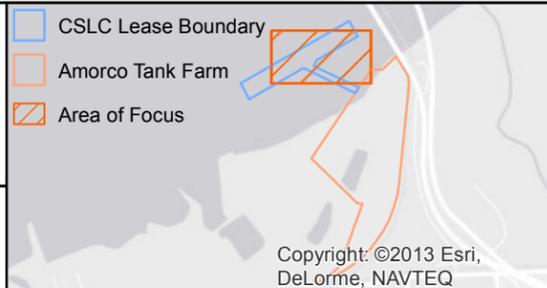


Figure 2-3
Amorco Marine Terminal
 California State Lands Commission
Amorco Marine Oil Terminal Lease



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- CSLC Lease Boundary
- Amorco Tank Farm
- Dolphins

1:1,200



1 inch = 100 feet



X:\CSLC\Amorco MOT102 Project Description\mxd\Figure 2-3 Amorco Marine Oil Terminal.mxd

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1 Approach Trestle

2 Access to the Amorco Terminal from the onshore Tank Farm is provided by a 28-foot-
3 wide by approximately 1,500-foot-long approach trestle. The approach trestle is
4 constructed of timber piles, pile caps, and other structural components such as cross-
5 bracing, handrails, and decking. Timber decking provides pedestrian and vehicle access
6 along the approach trestle. The approach trestle terminates at Dolphin A-34 on the west
7 end of the facility (refer to Figure 2-3). Approximately 160 feet from the approach trestle
8 termination point, another trestle branches off toward the northeast and provides
9 pedestrian and vehicle access to Dolphin A-71.

10 Dock Pipelines and Loading Hoses

11 The pipelines that serve the Amorco Terminal are supported on the east side of the
12 approach trestle. Amorco Terminal pipelines traverse above the water to approximately
13 1,100 feet from the shoreline. Approximately 350 feet before reaching the approach
14 trestle termination point, the pipelines turn northeast and are supported by a dedicated
15 400-foot pipeway that connects to Dolphin A-71. Dolphin A-71 supports the Amorco
16 Terminal manifolds and hoses. The manifolds service vessels that call on the northeast
17 side of the Amorco Terminal.

18 Crude oil is offloaded at the Amorco Terminal with two USCG-approved 10-inch off-
19 loading hoses. Product is transferred by the ship pumping system through the hoses,
20 block valves, and a 20-inch diameter pipeline to onshore tankage. Crude oil remaining in
21 the off-loading hoses is pumped back into the crude oil transfer line before hoses are
22 uncoupled from the ship. In addition to the 20-inch diameter crude oil pipeline, the Amorco
23 Terminal requires a 14-inch diameter firewater pipeline, a 4-inch diameter wastewater
24 and recovered oil pipeline, a 3-inch diameter fire foam pipeline, and a
25 3-inch diameter compressed air pipeline. All pipelines are located above water and are
26 accessible for inspection.

27 Additional Buildings

28 Four major buildings are located on the wharf. The first building, located on the west end
29 of the Amorco Terminal, houses a diesel-driven firewater pump. The second building,
30 located on the east end of the Amorco Terminal adjacent to the unloading manifold,
31 houses the Terminal Person-in-Charge (TPIC) during operations. This building contains
32 communication equipment, an operations panel for monitoring and operating tank and
33 pipeline valves (typically used during crude oil transfer and remote pipeline valve
34 operations), and a panel for monitoring wind and currents. The third building, located on
35 the approach trestle, is a personnel building containing a redundant tank- and pipeline-
36 monitoring panel, wind- and current-monitoring display, and employee lockers and lunch
37 facilities. The fourth building, located on the approach trestle, houses spill-response

1 equipment, electrical and instrumentation panels, and an air compressor. For a depiction
2 of building locations, refer to Figure 2-3.

3 **Mooring & Berthing Capacities**

4 As the Amorco Terminal has only one berth, it can only accommodate one vessel at a
5 time. Nine mooring points are available, providing single pelican hooks, double pelican
6 hooks, double quick-release hooks, and triple quick-release hooks.⁵ Movements of
7 product are accomplished using hoses, block valves, and associated steel pipelines.
8 Transfer pumps located on the berthing vessel assist with transferring product through
9 equipment.

10 The Amorco Terminal is currently authorized to accommodate up to 190,000 dead-weight
11 ton (DWT) vessels with displacements up to 200,000 long tons (although the water depth
12 at the berth limits vessel drafts to 38 to 40 ft. depending on vessel size).

13 **Stormwater Management, Drip, and Recovered Oil Collection**

14 A drip pan or catch basin provides stormwater and surface liquid containment at the
15 unloading manifold area of the Amorco Terminal (refer to Figure 2-3). Stormwater and
16 surface drips are collected and drained into a 500-gallon, dock-mounted steel recovery
17 tank, which is double-walled, internally coated, and protected from overflowing by level
18 control instrumentation. Recovered drip-pan stormwater and oil collections are typically
19 pumped onshore through the product transfer pipeline, but can also go via a 4-inch
20 diameter slops pipeline. Collections are treated onshore at the Refinery's Wastewater
21 Treatment Plant (WWTP).

22 In addition, the Amorco Terminal has the capability of receiving 'oily ballast water' (defined
23 in Section 2.3.3) or 'bilge water' (water that collects in the bilge, which is the lowest
24 compartment on a ship, below the waterline) for both emergency and non-emergency
25 situations. Oily ballast water and/or bilge water is pumped onshore to segregated tankage
26 at the Refinery for holding, treating, and isolation prior to treatment in the WWTP. Prior to
27 treatment in the WWTP, oily ballast water is transferred to the Golden Eagle Refinery
28 slops system, where water is pumped through the Refinery's oily water sewer and
29 separator. While this capability exists, ship operators and Tesoro typically cooperate to
30 minimize the amount of oily ballast and/or bilge water sent to the Refinery wastewater
31 treatment system. The segregated tank onshore holds a maximum of approximately
32 14,600 barrels.

⁵ Current mooring plans are on file with the CSLC Marine Facilities Division.

1 **2.3.2 Ballast Water**

2 Water confined in any hold of a vessel for the purposes of trim and stability is known as
3 *ballast water*. A ship carrying little or no cargo rides high in the water, having less draft
4 than a loaded ship. Ballast water intake is used to adjust the ship's position relative to
5 surrounding water levels, thus increasing stability, making the vessel less vulnerable to
6 waves and winds, and reducing the potential for the propeller to rise out of the water or
7 for the bow to be slammed when riding over high waves. Ballast water normally enters a
8 ship through intakes located below the waterline. Depending on the level of the tank
9 relative to the water surface, water may be taken in or discharged, either by pumping or
10 by gravitational flow, to: adjust a ship's trim; improve maneuverability; increase propulsion
11 efficiency; reduce hull stress; raise the ship to pass over shallow areas (reduce draft);
12 and lower the ship to get under bridges or cranes (lower air draft). Crude oil tankers
13 typically have specially constructed segregated water tanks that hold ballast water. Ships
14 discharging ballast water from other areas may introduce nonindigenous species that can
15 invade and possibly harm ecosystems. For more detailed information, see Section 4.2,
16 Biological Resources.

17 **Ballast Water Regulations**

18 Vessels are required to comply with all federal and State ballast water laws, regulations,
19 and permits. Ballast water is regulated at the federal level by the USCG and U.S.
20 Environmental Protection Agency (USEPA).

21 U.S. Coast Guard

22 The USCG regulates ballast water through regulations found in 33 Code of Federal
23 Regulations (CFR) Part 151. USCG regulations, developed under authority of the
24 Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 and later revised
25 and reauthorized as the National Invasive Species Act of 1996, require the management
26 of ballast water. These regulations are specific to vessels entering United States waters
27 from outside the United States Exclusive Economic Zone.⁶ In 2012, the USCG amended
28 its regulations on ballast water management by establishing a standard for the allowable
29 concentration of living organisms in ballast water discharged from ships in waters of the
30 United States. The USCG also amended its regulations for engineering equipment by
31 establishing an approval process for ballast water management systems.

⁶ An Exclusive Economic Zone is a sea zone prescribed by the United Nations Convention on the Law of the Sea over which a state has special rights over the exploration and use of marine resources, including energy production from water and wind. It stretches from the seaward edge of the state's territorial sea out to 200 nautical miles (nm) from its coast.

1 Environmental Protection Agency

2 The USEPA regulates ballast water and other discharges incidental to normal vessel
3 operations through the Clean Water Act, specifically the National Pollutant Discharge
4 Elimination System (NPDES) Permit program. In December 2008, the USEPA released
5 the NPDES Vessel General Permit (VGP) for Discharges Incidental to the Normal
6 Operation of Commercial Vessels and Large Recreation Vessels. In March 2013, the
7 USEPA released the 2013 NPDES VGP, set to replace the 2008 VGP when it expires in
8 December, 2013. The 2013 final VGP will continue to regulate 26 specific discharge
9 categories that were contained in the 2008 VGP, and would provide coverage for fish hold
10 effluent in the event that a permitting moratorium currently in effect expires in December
11 2014. For the first time, the final VGP contains numeric ballast water discharge limits for
12 most vessels. The permit generally aligns with requirements contained within the 2012
13 U.S. Coast Guard ballast water rulemaking. Additionally, the VGP contains requirements
14 to ensure ballast water treatment systems are functioning correctly, more stringent
15 effluent limits for oil to sea interfaces and exhaust gas scrubber washwater, additional
16 administrative requirements, and numerous other additional environmental protections
17 and ballast water management provisions.

18 State Requirements

19 Amorco Terminal-bound vessels must comply with the California Ballast Water
20 Management for Control of Nonindigenous Species Act of 1999 (as amended by the
21 Marine Invasive Species Act of 2003) and Public Resources Code sections 71200-71217
22 that specify ballast water management practices. Several of these ballast water
23 management practices are permissible for vessels arriving from a California port; others
24 are allowable for vessels arriving from a port or place outside the Pacific Coastal Region.⁷
25 Ballast water management practices for vessels arriving from places outside the Pacific
26 Coastal Region (Pub. Resources Code § 71204.3) include:

- 27 • exchanging the vessel's ballast water in mid-ocean waters, before entering the
28 coastal waters of the State;
- 29 • retaining the ballast water onboard the vessel;
- 30 • discharging the ballast water at the same location where the ballast water
31 originated, provided that the master, operator, or person in charge of the vessel
32 can demonstrate that the ballast water to be discharged was not mixed with ballast
33 water taken on in an area other than mid-ocean waters;

⁷ The Pacific Coast Region refers to all coastal waters on the Pacific Coast of North America east of 154 degrees West longitude and north of 25 degrees North latitude, exclusive of the Gulf of California.

- 1 • using an alternative, environmentally sound method of ballast water management
- 2 that, before the vessel begins the voyage, has been approved by the CSLC in
- 3 consultation with the USCG as being at least as effective as exchange, using mid-
- 4 ocean waters, in removing or killing nonindigenous species;
- 5 • discharging ballast water to a CSLC-approved reception facility; and
- 6 • under extraordinary conditions, conducting a ballast water exchange within an area
- 7 agreed to by the CSLC in consultation with the USCG at the time of the request.

8 Ballast water management practices for vessels arriving from places within the Pacific
9 Coastal Region (Pub. Resources Code §§ 71201.7 and 71204.5; Cal. Code Regs., tit. 2,
10 § 2280 et seq.) include:

- 11 • exchanging the vessel's ballast water in near-coastal waters, before entering the
- 12 waters of the State, if that ballast water has been taken on in a port or place within
- 13 the Pacific Coastal Region;
- 14 • retaining the ballast water onboard the vessel;
- 15 • using an alternative, environmentally sound method of ballast water management
- 16 that has been approved by the CSLC before the vessel begins the voyage, and
- 17 that is at least as effective as ballast water exchange in removing or killing
- 18 nonindigenous species;
- 19 • discharging ballast water to a CSLC-approved reception facility; and
- 20 • under extraordinary conditions, conducting a ballast water exchange within an area
- 21 agreed to by the CSLC in consultation with the USCG at the time of the request.

22 In 2006, the CSLC was tasked with the preparation of regulations under Public Resources
23 Code section 71205.3 that require vessels operating in waters of the State to meet
24 performance standards for ballast water discharge. These regulations were adopted in
25 2007 (Cal. Code Regs., tit. 2, § 2291 et seq.) and will be applied to vessels in a phased
26 approach between 2010 and 2016. Through the interim, performance standards for
27 ballast water discharges are outlined in section 2293. Subject to the implementation
28 Schedule in section 2294, before discharging ballast water in waters subject to the
29 jurisdiction of California, the master, owner, operator, or person in charge of a vessel to
30 which this section applies shall conduct ballast water treatment so that ballast water
31 discharged will contain A final discharge standard of zero detectable living organisms for
32 all organism size classes in ballast water discharge shall be implemented on January 1,
33 2020, for all vessel size classes.

1 Vessels are also required to minimize the uptake and the release of nonindigenous
2 species as follows:

3 • avoid the discharge or uptake of ballast water in areas within, or that may directly
4 affect, marine sanctuaries, marine preserves, marine parks, or coral reefs;

5 • minimize or avoid uptake of ballast water in all of the following areas and
6 circumstances:

7 – areas known to have infestations or populations of harmful organisms and
8 pathogens;

9 – areas near a sewage outfall;

10 – areas near dredging operations;

11 – areas where tidal flushing is known to be poor, or times when a tidal stream is
12 known to be more turbid;

13 – in darkness when bottom-dwelling organisms may rise up in the water column;
14 and

15 – where propellers may stir up the sediment;

16 • remove vessel biofouling organisms from hull, piping, propellers, sea chests, and
17 other wetted portions of a vessel on a regular basis, and dispose of removed
18 substances in accordance with local, State, and federal laws, regulations, and
19 permits; prior to and until the date that the regulations described in Public
20 Resources Code section 71204.6 are adopted, “regular basis” means any of the
21 following:

22 – no longer than by the date of expiration on the vessel’s full-term Safety
23 Construction Certificate or an extension of that expiration date,

24 – no longer than by the date of expiration of the vessel’s full-term USCG
25 Certificate of Inspection or an extension of that expiration date by the USCG,
26 or

27 – no longer than 60 months since the time of the vessel’s last out-of-water dry
28 docking. The commission may approve a time extension to this period;

29 • in-water cleaning of submerged portions of a vessel shall be conducted using best
30 available technologies economically achievable, and designed to minimize the
31 release of coating and biological materials, cleaning agents, and byproducts of the
32 cleaning process into the surrounding waters. The cleaning shall be performed in
33 accordance with local, State, and federal laws, regulations, and permits, including
34 the California State Water Resources Control Board’s Section 401 Certification of
35 the USEPA Vessel General Permit.

1 Amorco Terminal Requirements

2 As outlined in Tesoro's Amorco Marine Oil Terminal Operations Manual (Operations
3 Manual), the Amorco Terminal has various requirements regarding the handling of ballast
4 wastes from tank ships and barges. These operation requirements are established upon
5 the following standards:

- 6 • USCG regulations (33 CFR 158) concerning the availability and adequacy of oily
7 water and residue and solid waste reception facilities at marine terminals. These
8 regulations are the basis for issuing Certificates of Adequacy to marine terminals.
9 These documents qualify a terminal as having adequate facilities to receive and
10 properly dispose of oily waste water from ocean-going ships' SLOP tanks without
11 causing undue delay to these ships.
- 12 • USEPA regulations concerning the storage, treatment, and disposal of hazardous
13 and non-hazardous wastes.
- 14 • Tesoro corporate and Martinez refinery policies and procedures regarding
15 wastewater treatment plant operations.

16 The Operations Manual describes ship ballast water and waste-handling facilities at the
17 Refinery and how these facilities are typically used. USCG regulations require vessels to
18 provide 24 hours' advance notice to a marine terminal regarding any potential needs for
19 discharging oily water. Notice, including a description of the material to be discharged,
20 must be provided to Tesoro for all potential oily ballast or nonsegregated waters. The
21 TPIC completes required sampling prior to and following the ship-to-WWTP ballast
22 transfer. The TPIC is responsible for taking custody of the samples for retention and
23 completing the required documentation forms.

24 **2.3.3 Marine Vapor Recovery System**

25 Bay Area Air Quality Management District (BAAQMD) regulations require a Marine Vapor
26 Recovery (MVR) system to capture hydrocarbon emissions from ships loading at a
27 terminal. Because the Amorco Terminal is presently precluded from ship loading, an MVR
28 system has not been included in current Amorco Terminal operations. Should Tesoro
29 decide at a later date to use the Amorco Terminal for loading purposes, an MVR system
30 would be developed and incorporated into current operations.

31 **2.3.4 Marine Oil Terminal Engineering and Maintenance Standards**

32 The Marine Oil Terminal Engineering and Maintenance Standards (MOTEMS) became
33 effective on February 6, 2006, and are codified in Chapter 31F of the California Building
34 Code – Marine Oil Terminals (Cal. Code Regs., tit. 24, § 3101F et seq.). The MOTEMS
35 are reviewed and updated at least every 3 years and all terminals are required to comply
36 with the most recent version. These minimum engineering, inspection, and maintenance
37 standards apply to all existing and new terminals in California, and include criteria for

1 audits; maintenance; inspection; structural and seismic analysis and design; mooring and
2 berthing; geotechnical considerations (including site-specific assessment); and analysis
3 and review of fire, piping, mechanical, and electrical systems.

4 Tesoro completed its initial MOTEMS Audit of the Amorc Terminal in November 2007,
5 including comprehensive inspections and evaluations of the existing structural and non-
6 structural facilities. Based on Tesoro's findings, seismic structural strengthening, fire
7 system upgrades and comprehensive structural and non-structural improvements were
8 initiated and completed at the Amorc Terminal between 2008 and 2013.

9 Tesoro also completed their first subsequent MOTEMS Audit of the Amorc facility in
10 March 2011, and is required to continue to perform routine Audits and inspections of the
11 Amorc Terminal in accordance with MOTEMS. Future actions to comply with MOTEMS
12 Audit and inspection findings may include physical changes to the Amorc Terminal and
13 associated lease area. Depending on the nature and extent of any such changes,
14 additional discretionary review by the CSLC Marine Facilities Division and/or Land
15 Management Division may be required. Such discretionary review may also trigger
16 California Environmental Quality Act review of future actions.

17 The following primary modifications, among several other minor changes, were
18 completed as a result of the 2007 and 2011 MOTEMS Audits.

- 19 • The Amorc Terminal firewater system was upgraded to include a new
20 Uninterruptable Power Supply system, fire detection and alarm system, and back-
21 up electrical generator.
- 22 • The seismic strengthening work was the largest undertaking, to address identified
23 vulnerabilities to earthquakes, and included seismic improvement of the concrete
24 breasting dolphins (Dolphins A-76, A-77 and A-80), timber loading platform (A-71),
25 and timber fire pump platform (A-34). This project was completed in June 2013.
- 26 • Additional repairs identified in MOTEMS Audits and inspections have been
27 completed, such as repair of sleeves on grout-filled fiberglass piles, installation of
28 structural reinforcement fiberglass cross-bracing between piles, and installation of
29 structural reinforcement of existing pile caps.

30 For more information regarding seismic upgrades, see Section 4.5, Geology, Sediments,
31 and Seismicity.

32 **2.4 OPERATIONS**

33 Present operations at the Amorc Terminal involve the transfer of crude oil from tanker
34 vessels to Tesoro's Tank Farm, from which the oil is eventually piped to Tesoro's
35 Refinery. Equipment throughout the facility is controlled by both manual operators and
36 automatic control systems. Marine terminal operations are dictated by vessel schedule,

1 as well as tide and current; therefore, unloading operations can occur at any time, day or
2 night. Although actual operation depends on shipping demands, the Amorco Terminal is
3 capable of operating 365 days per year, 24 hours per day. Crude oil transfer operations
4 are conducted in accordance with all applicable regulations and the Amorco Terminal
5 Operations Manual required by California Code of Regulations, Title 2, section 2385.

6 **2.4.1 Personnel and Communications**

7 A minimum of two personnel are required to be on duty during marine transfer operations,
8 the TPIC and a second crew member, and they typically work a 12-hour shift. Therefore,
9 a minimum of approximately four employees (two employees per 12-hour shift) make trips
10 to and from the facility each day. The TPIC supervises all vessel docking and transfer
11 operations from the transfer manifold location. The second crew member provides relief
12 for the TPIC and generally assists operations at other times. Both personnel have
13 responsibilities for observing operations and reporting security and emergency issues
14 such as oil spills. In addition, other personnel may be on the wharf for maintenance or
15 additional assistance with operations, as required.

16 Communications are maintained by various means, including:

- 17 • portable radios, carried by both the TPIC and the Vessel Person-In-Charge (VPIC),
18 provided by the Amorco Terminal to the vessel. The same radio can be used by
19 the TPIC to contact Refinery personnel on other channels;
- 20 • VHF radio, available for use by the TPIC;
- 21 • two direct telephone lines to the Refinery and outside lines; and
- 22 • a cell phone, carried by the TPIC, which is linked to the two land lines.

23 For information on communication practices during emergencies or unexpected
24 conditions, see Section 2.6, Emergency Response.

25 **2.4.2 Security and Lighting**

26 The Refinery is required to comply with State and federal security and lighting regulations.
27 This is accomplished by operating in compliance with the Refinery Facility Security Plan
28 (FSP), which includes the Amorco Terminal. The FSP is subject to approval at 5-year
29 intervals by the USCG. The current agency-approved FSP will expire in August 2014. The
30 USCG performs one annual deliberate inspection, as well as three to four random
31 inspections per year, to ensure FSP compliance. Current copies of the FSP are kept on-
32 site.

33 As described in the FSP, access to the Amorco Terminal is limited to authorized personnel
34 and vehicles. Unescorted personnel who have been granted access must have a valid
35 Tesoro access badge and must be enrolled in the Transportation Worker Identification

1 Credential Program, as administered by the U.S. Department of Homeland Security,
2 Transportation Security Administration. Third-party security system providers are
3 contracted to manage security personnel and vehicles at the Refinery. The main security
4 gate locations are manned and have automated lift gates. Upon entering the facility,
5 Tesoro personnel are required to check in at the Amorco Terminal security building.
6 Pedestrian access to the approach trestle is provided via an automated rotating gate that
7 requires a valid Tesoro access badge to operate. Vehicle access is provided via an
8 automated gate that is controlled by security staff. Over-water access ladders are
9 provided at the Amorco Terminal; all ladders are secured with locked metal gates that
10 must be manually unlocked for access.

11 Video camera surveillance is provided at various priority locations within the Amorco
12 Terminal and associated onshore facilities. Multiple security video cameras are mounted
13 and operated at the Amorco Terminal. Roaming security vehicles operate 24 hours a day,
14 365 days a year. Exterior lighting is provided along the approach trestle and at the wharf
15 to allow for night operations and provide safety for employees. The wharf cannot be
16 accessed from adjacent public shore areas.

17 **2.4.3 Preliminary Amorco Terminal Inspection and Testing**

18 The TPIC supervises all ship mooring and transfer operations, including inspection and
19 testing of the Amorco Terminal's condition prior to any ship's arrival. Information on
20 operating procedures is detailed in the Operations Manual. Items that are required to be
21 checked prior to the arrival of every vessel include the following:

- 22 • confirm low liquid level in slops tank;
- 23 • inspect the fire water supply pump and the condition of portable fire extinguishers
24 and water supply monitors;
- 25 • check that all equipment, including life vests, hard hats, tools, gaskets, gauging
26 equipment, and sampling equipment, are accessible and in good condition;
- 27 • check that the boom is in its proper location and in good condition;
- 28 • check to assure electrical power is in working order;
- 29 • test capstans and winches, and both check and test sump piping and controls;
- 30 • inspect all hoses, pumps, and valves for proper positioning, operation, and
31 damage;
- 32 • check to assure all required documents are accessible;
- 33 • shut down any hot work such as work involving cutting or burning;
- 34 • confirm with onshore technician(s) that tanks, pumps, and valves are aligned and
35 that the Amorco Terminal is ready to transfer cargo;

- 1 • select and verify set points of pressure switches and valves;
- 2 • assure that any other traffic at the wharf is stopped; and
- 3 • notify the ship that the Amorco Terminal is ready for docking.

4 **2.4.4 Berthing**

5 Ships are required to berth in compliance with applicable USCG and MOTEMS
6 requirements, including restrictions on size (both DWT and displacement) and draft of
7 ships. Specific berthing procedures for the Amorco Terminal are detailed in the *San*
8 *Francisco Bar Pilots Operations Guidelines for the Movement of Vessels on San*
9 *Francisco Bay and Tributaries, Addendum 3* (dated August 29, 2013) and the Amorco
10 Wharf Operations Manual. As indicated in these guidelines and the San Francisco Harbor
11 Safety Plan, all berthing vessels must maintain 3 feet of under-keel clearance (UKC)
12 when underway. Tesoro requires that vessels maintain 2 feet of UKC through any stage
13 of the tide while alongside the Amorco Terminal. All vessels must have 3 feet of UKC
14 when passing Pinole Shoal.

15 Additionally, the Amorco Terminal has the following tug boat requirements.

- 16 • Barges with 5,000 long tons of petroleum cargo on board must use a twin screw
17 Class C tug or better for docking and undocking to complement the barge's line
18 haul tug.
- 19 • Ships up to 50,000 DWT will require a minimum of two twin screw conventional
20 Class A tugs for docking and undocking.
- 21 • Ships between 50,000 DWT and 120,000 DWT will require a minimum of one
22 tractor and one twin screw conventional Class A tug for docking and undocking.
- 23 • Ships between 120,000 DWT and 188,500 DWT will require a minimum of two
24 tractors and one twin screw conventional Class A tug for docking and undocking.

25 **2.4.5 Mooring**

26 Tesoro is required to maintain mooring configurations in accordance with MOTEMS.
27 Ships are moored to minimize drift, with the center of a ship's manifold directly opposite
28 the cargo hoses. In general, a minimum of 10 mooring lines are used for all vessel
29 classes. Mooring limits also provides operational restrictions based on wind, current, and
30 passing ship conditions. Ship crews are responsible for positioning the vessel, tensioning
31 mooring lines, and maintaining proper tension; however, Amorco Terminal staff are
32 responsible for ensuring that the Amorco Terminal Operating Limits (TOLs) are enforced.
33 Due to high currents and passing vessel effects at the Amorco Terminal, vessels are
34 required to be tightly moored against the breasting dolphins. Tensioning is monitored by
35 both vessel and wharf personnel throughout the time the vessel is moored.

1 Even though the ship is required to be moored to minimize drift, the wharf hoses can
2 tolerate up to 10-foot drifts from the base centerline of the hose/manifold in either direction
3 or parallel to the wharf. Once moored, a portable radio is provided to the ship's VPIC and
4 tested to assure it is in working order. The TPIC tests and verifies operation of the
5 shutdown system, as needed. Next, a pre-transfer conference with the ship's VPIC, often
6 the vessel's Captain or First Officer, is held and the Declaration of Inspection is completed
7 per California Code of Regulations, Title 2, sections 2330 and 2335. The TPIC reviews
8 the cargo transfer orders, including quantity and product type, and transfer rates, to obtain
9 a clear understanding of the cargo transfer. Pumping rates to the wharf range from
10 approximately 3,500 to 30,000 barrels per hour (bph).

11 Once the loading-hose connections are on the ship, vessel personnel are required to pull
12 the plastic bag and blind flange off (used to block off the loading-hose connections when
13 not in use). This is completed only over an approved secondary containment or drip pan.
14 Vessel personnel then bolt the hose flange to the ship's manifold, using a new gasket for
15 each connection.

16 **2.4.6 Transfers**

17 Crude oil is transferred to the Amorc Terminal by pumps onboard the calling vessels.
18 Once the TPIC and the onshore operator have confirmed that the pipelines, valves,
19 pumps, and tanks are properly aligned, the transfer procedure can commence. The TPIC
20 and VPIC agree when to start transfers via the portable radios.

21 Pumping begins at a low rate, and once proper operations are confirmed, the loading
22 rates are gradually increased. The TPIC is required to observe pump discharge
23 pressures. Uninterrupted radio communication between the TPIC, VPIC, and the onshore
24 operator is required to be maintained during the entire crude oil transfer. The TPIC closely
25 observes the equipment for any unanticipated changes in pressure that could result from
26 leaks or improper valve or pump operation. If unanticipated changes are observed, the
27 TPIC would shut down the transfer. In addition, the TPIC is required to check for drips,
28 leaks, and spills at least once per hour; check office controls and circuit breakers for any
29 abnormal conditions; and check mooring conditions. As the transfer nears completion,
30 the loading rate is reduced. At completion, the pumps are shut down, and the VPIC
31 secures the pumps with a remote shutdown switch. Finally, the dock valves are closed
32 and secured by the TPIC.

33 Next, the cargo hose vent valve is opened and allowed to drain to the ship. The onboard
34 end of the hoses are emptied to the slops system or pumped to the crude transfer line.
35 Vessel personnel disconnect the transfer hoses, install a blind flange on the end of the
36 hose, and install a plastic bag over the end while it is still on the vessel and over the
37 vessel's drip pan. The blind is bolted and the VPIC confirms that the gasket and plastic
38 bag are in place. Confirmation between the TPIC and landside operator is conducted to

1 assure that all shore valves and tanks are correctly positioned. The hoses are returned
2 to stored positions on the dock and secured.

3 Final paperwork and copies of the Declaration of Inspection are completed per California
4 Code of Regulations, Title 2, section 2335. The radio is retrieved from the vessel and the
5 vessel can be unmoored. Final duties of the TPIC include: Checking to assure that the
6 sump is properly pumped out; putting away tools; taking samples to the sample storage
7 building in the Amorco Terminal; and delivering completed logs, forms, and paperwork to
8 the main office.

9 Should an emergency occur while a vessel is discharging, transfer operations at the
10 Amorco Terminal are immediately suspended, including the suspension of transfer pumps
11 and the closing of valves onboard the vessel. For more information regarding emergency
12 response during product transfer, see Section 2.6.1, Emergency Shutdown.

13 **2.4.7 Vessel Calls and Throughput Volumes**

14 Table 2-2 shows the annual vessel calls and throughput for the Amorco Terminal for the
15 years 2008 through 2012 in barrels per year (bpy). (For more information regarding vessel
16 calls and throughput volumes, see Section 4.1, Operational Safety/Risk of Accidents.) As
17 presented, over the last 5 years, Amorco Terminal crude oil receipts have ranged from
18 16.9 to 26.8 million bpy. Averaging 69 tankers per year (between 2008 and 2012), the
19 Amorco Terminal has previously averaged less than two calls per week. Mooring time
20 varies with vessel volume and type of cargo; however, ships are generally off-loaded at
21 a rate of 17,000 to 18,000 bph. Typically, ships with a cargo between 360,000 and
22 530,000 barrels of product dock for approximately 20 to 30 hours.

23 The level of shipment activity and throughput is not expected to change substantially
24 during the proposed 30-year lease agreement period. The development of new inland
25 crude sources within California, such as Bakersfield, or the trans-shipment of crude oil
26 from other domestic sources outside of California (e.g., via rail), which would replace
27 marine shipments, is not anticipated. Marine shipments of crude oil and demands for
28 refinery products are expected to continue at a similar or slightly increased rate as seen
29 in previous years.

30 Anticipated Terminal use for operations in the immediate future ranges from
31 approximately 20 million bpy (55,000 bpd) to approximately 30 million bpy (82,000 bpd)
32 of imported crude oil. This corresponds to annual ship and barge traffic of approximately
33 60 to 90 vessels (anticipated maximum). This number of vessel calls serves as the basis
34 for the impact analysis in Section 4.0, Environmental Impact Analysis.

1 **Table 2-2: Amorc Terminal Vessel Calls and Terminal Receipts**

Year	Total Vessels	Amorc Terminal Receipts (barrels per year)
2008	85	26,859,593
2009	76	22,540,607
2010	53	16,900,791
2011	64	22,634,330
2012	67	23,941,608

2 The maximum amount of throughput that the Refinery is currently permitted to process
 3 by the BAAQMD is 183,000 bpd annual average, or 63,875,000 bpy. The Amorc
 4 Terminal is limited by the BAAQMD to 70,080,000 barrels per 12 consecutive months.

5 **2.4.8 Terminal Operating Limits**

6 MOTEMS requires terminals to establish Terminal Operating Limits (TOLs), berthing-
 7 system operating limits that are primarily based on mooring and berthing assessments.
 8 These TOLs are terminal-specific restrictions, addressing vessel size, environmental,
 9 berthing, mooring, gravity-loading, and other operating limitations. TOLs for the Amorc
 10 Terminal are included in the Operations Manual, per California Code of Regulations, Title
 11 2, section 2385.

12 As mentioned in Section 2.3.1, the Amorc Terminal is currently authorized to
 13 accommodate up to 190,000 DWT. However, TOLs resulting from the draft of a ship's hull
 14 (the vertical distance between the waterline and the bottom of the hull [keel], with the
 15 thickness of the hull included) and the arrival mass of the vessel typically limit vessel
 16 sizes. The maximum overall length of vessels permitted to call at the Terminal is 941 feet.
 17 The minimum UKC of vessels ranges between 4 and 6 feet, depending upon vessel size.

18 Additional limiting factors for vessels calling at the Amorc Terminal involve water depth
 19 and bridge clearance. The maximum current draft of vessels transiting to the Terminal is
 20 restricted by the Pinole Shoals Channel, whose calculated maximum depth is
 21 approximately 34.5 feet Mean Lower Low Water (MLLW),⁸ plus or minus the tide height
 22 at the transiting time, with allowance of at least 3 feet for under-keel clearance.⁹ The
 23 maximum vertical bridge clearance (i.e., distance from the waterline to the lowest point

⁸ Tides in the San Francisco Bay Area are mixed. Usually two cycles of high and low tides, each cycle characterized by varying height, occur daily. Occasionally, the tidal cycle will become diurnal (only one cycle of tide in a day). Depths in the san Francisco Bay are based on MLLW, which is the average daily low tide whereby the lowest low tide is averaged.

⁹ Federal, State, and local agencies and shipping interests have considered deepening the Pinole Shoals.

1 along the bridge) for the Carquinez Bridge is approximately 134 feet Mean Higher High
2 Water (MHHW) and for the Benicia-Martinez Bridge is approximately 135 feet MHHW.¹⁰

3 **2.4.9 Shipping Routes**

4 In 1992, the Western States Petroleum Association, in agreement with the California
5 Department of Fish and Wildlife (CDFW, formerly the California Department of Fish and
6 Game) and 10 oil shipping companies, adopted a voluntary agreement to maintain a
7 minimum distance of 50 nm offshore from mainland for loaded crude oil tankers transiting
8 between Alaska and California, except when approaching from offshore into the main
9 (west) directed-traffic area south of the Farallon Islands. Vessel traffic lanes are
10 established for north, south, and west approaches to San Francisco Bay. Each approach
11 consists of a 1-mile-wide inbound lane, a 1-mile-wide outbound lane, and a 1-mile-wide
12 separation zone. Approximately 16 miles west of the Golden Gate, these lanes enter a
13 "Precautionary Area" where traffic is merged with eastbound traffic lanes through the Bar
14 Channel toward San Francisco Bay (see Figure 2-4).

15 Once inside the Precautionary Area, vessels use the USCG Vessel Traffic Service on
16 Yerba Buena Island. Vessels pass through Regulated Navigational Areas (RNA) on their
17 way to the Terminal (see Figure 2-5). RNAs organize traffic-flow patterns to reduce vessel
18 congestion where maneuvering room is limited; reduce meeting, crossing, and overtaking
19 situations between large vessels in constricted channels; and limit vessel speed. Vessels
20 proceed through the San Francisco Bay and San Pablo Bay up through the Carquinez
21 Strait and enter Bulls Head Channel along the south side of Suisun Bay (see Figure 2-6).
22 Vessels calling at the Terminal typically pass through the San Francisco Bay RNA, North
23 Ship Channel RNA, San Pablo Strait Channel RNA, and Pinole Shoal Channel RNA
24 before entering Carquinez Strait and the Southern Pacific Railroad RNA in Carquinez
25 Strait.

26 Vessels transit San Francisco Bay along one of several traffic lanes depending on draft.
27 These include the Deep Water Traffic Lane north of Harding Rock or the
28 westbound/eastbound traffic lanes north/south of Alcatraz.

29 Some vessels must "lighter" cargo (transfer crude oil from a large ship to a smaller vessel)
30 to reduce draft prior to traveling through the shallower shipping channels that reach the
31 Amorco Terminal. Lightering of crude oil is restricted to the Anchorage 9 area that is
32 located south of the San Francisco Bay Bridge (see Figure 2-7). Circumstances that
33 require lightering operations are varied and not necessarily related to specific vessels or
34 cargo. Lightering operations are conducted using vapor recovery to meet emission limits
35 specified under the BAAQMD Regulation 8, Rule 46, Marine Tank Vessel to Marine Tank
36 Vessel Loading. Tesoro has no control over, ownership of, or authority to direct vessels

¹⁰ Ordinary circumstances do not require a tanker to go under the Benicia-Martinez Bridge for turning movements or shipments.

1 on alternative methods that would be implemented to partially load and unload or lighter
2 cargos prior to berthing at the Terminal dock. Over the past approximately 6 years, Tesoro
3 has had approximately six vessels lighter at Anchorage 9. None of these events occurred
4 in 2012. In summary, during the proposed lease period, Amorco Terminal-bound vessels
5 may lighter.

6 The distance from the Golden Gate Bridge to the Amorco Terminal is approximately 31
7 miles. Vessels stop to pick up a San Francisco Bay pilot at the sea buoy, which is 11
8 miles outside the Golden Gate Bridge. This local pilot assists the ships in maintaining safe
9 maneuvering upstream. At an average speed of 10 nm per hour (knots), it takes
10 approximately 3 hours to reach the Terminal.

11 **2.4.10 Waste Management**

12 Waste generated during operations is minimal and of a household/commercial nature.
13 Containerization and removal of solid municipal waste is currently accommodated by
14 Golden Gate Disposal and Recycling Company.

15 **2.5 INSPECTION AND MAINTENANCE**

16 Tesoro performs routine inspection and maintenance on the wharf to ensure proper
17 operation and to meet regulatory obligations. These inspection and maintenance activities
18 include the following.

- 19 • The Terminal is staffed 24 hours per day and visual inspections to confirm pipeline
20 integrity are performed at least once per 12-hour shift.
- 21 • CSLC-mandated deadweight hydrotests are performed every 3 years per
22 California Code of Regulations, Title 2, section 2564.
- 23 • External ultrasonic thickness surveys are performed every 3 years per California
24 Code of Regulations, Title 2, section 2570.
- 25 • USCG-mandated hydrotests are performed as required.
- 26 • MOTEMS audits and inspections and MOTEMS-required maintenance are
27 performed as described in Section 2.3.5.
- 28 • Visual inspections of piping are performed at least once per year by Tesoro's
29 American Society for Testing and Materials-certified inspectors.
- 30 • New hoses are visually inspected and hydrotested upon installation, and annually
31 thereafter, in accordance with California Code of Regulations, Title 2, section 2380
32 incorporating by reference standard IP-11-4 Oil Suction and Discharge Hose:
33 Manual for Maintenance, Testing and Inspection issued by the Rubber
34 Manufacturers Association.

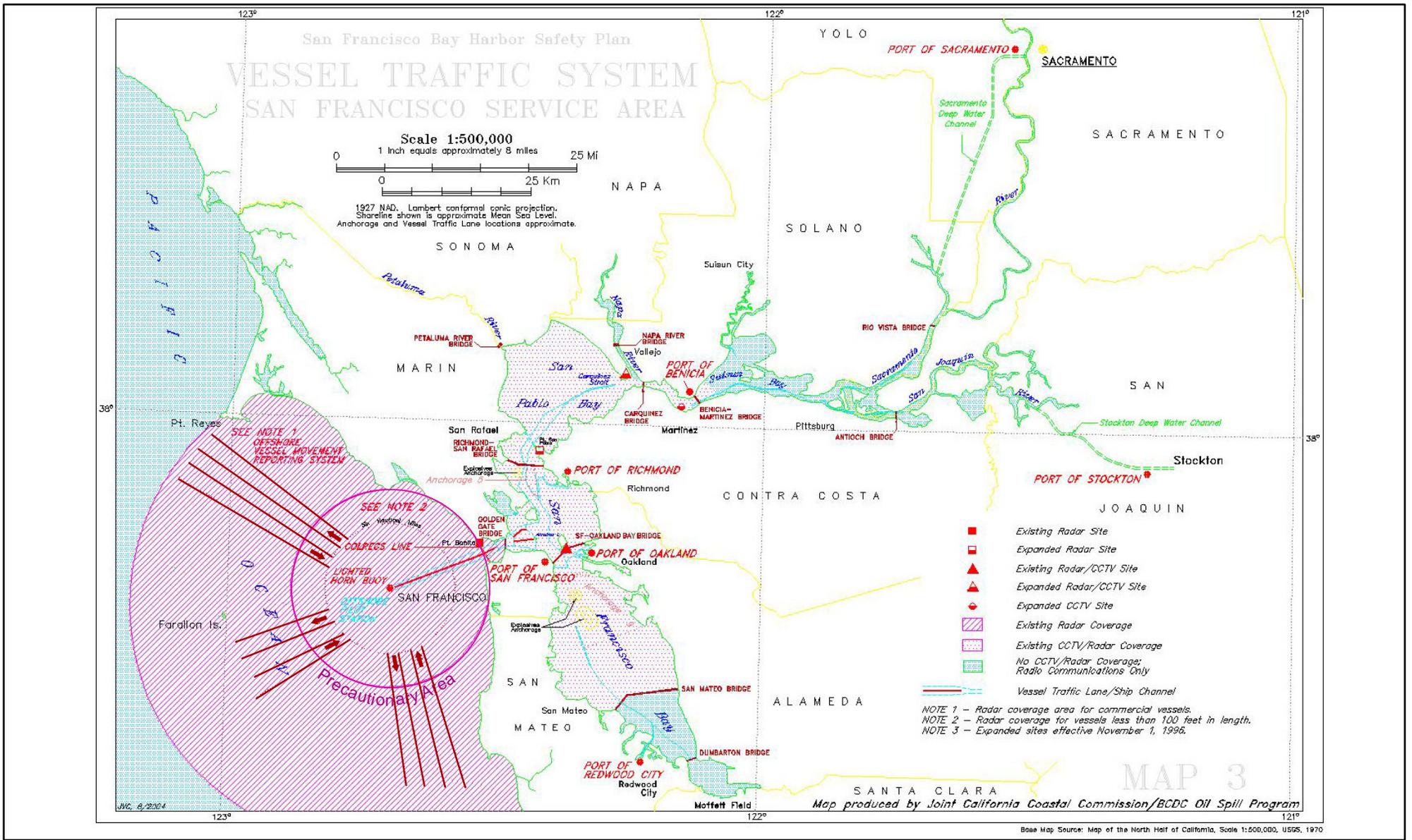


Figure 2-4
Vessel Traffic System
 California State Lands Commission
 Amorcó Marine Oil Terminal Lease Consideration Project



2/14/2013



Source: Marine Exchange of the
 San Francisco Bay Region

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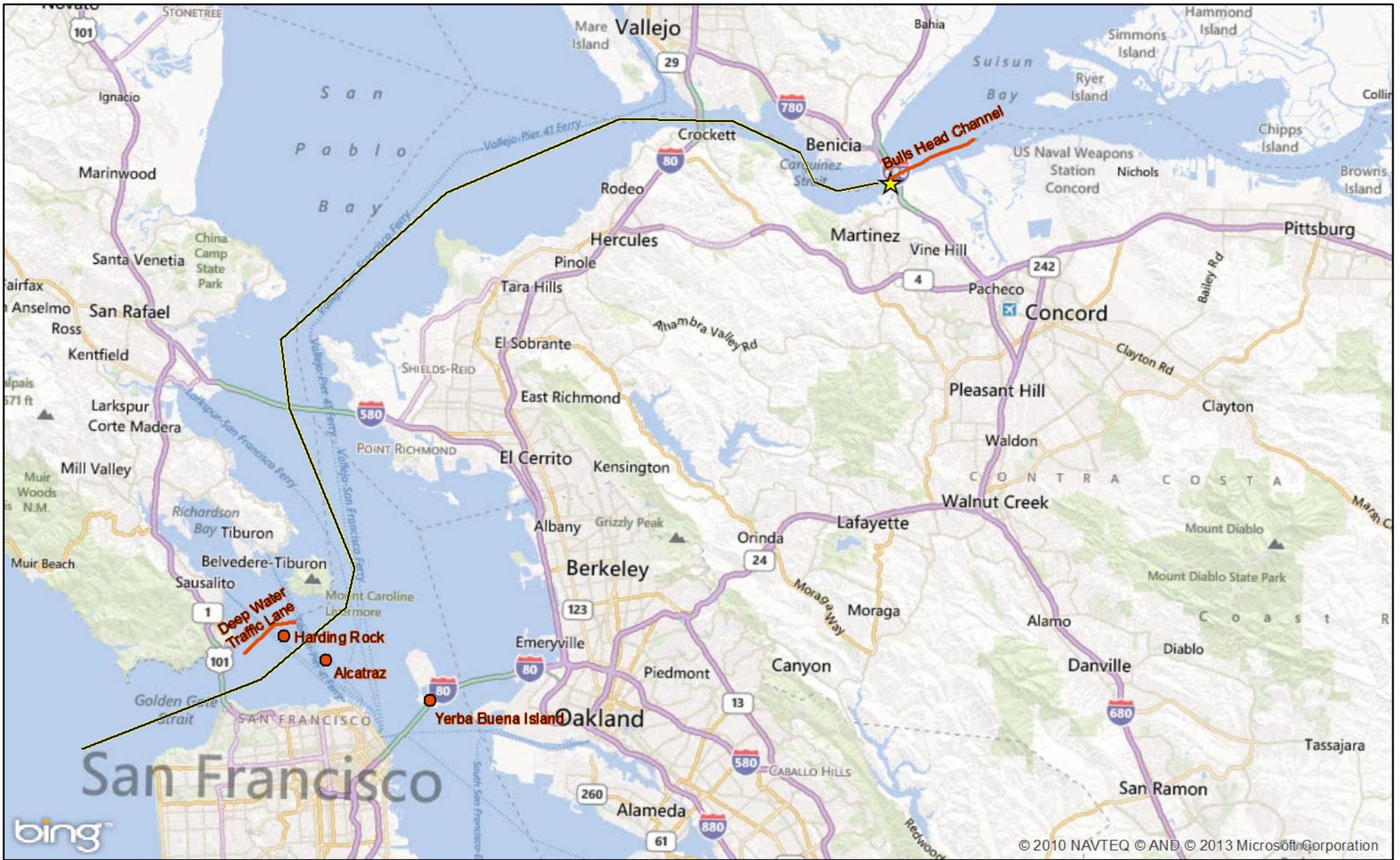
X:\CSLC\Amorco MOT\02 Project Description\mxd\Figure 2-5 Regulated Navigation Areas.mxd

Figure 2-5 Regulated Navigation Areas

California State Lands Commission
 Amorco Marine Oil Terminal Lease
 Consideration Project



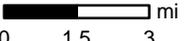
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© 2010 NAVTEQ © AND © 2013 Microsoft Corporation
 X:\CSLC\Amorco MOT102 Project Description\mxd\Figure 2-6 Transit Route of Vessels.mxd

Figure 2-6
Transit Route of Vessels
 California State Lands Commission
 Amorco Marine Oil Terminal Lease Consideration Project

 Amorco Terminal Location
 Typical Transit Route


 1:250,000
 1 inch = 4 miles
 mi
 0 1.5 3

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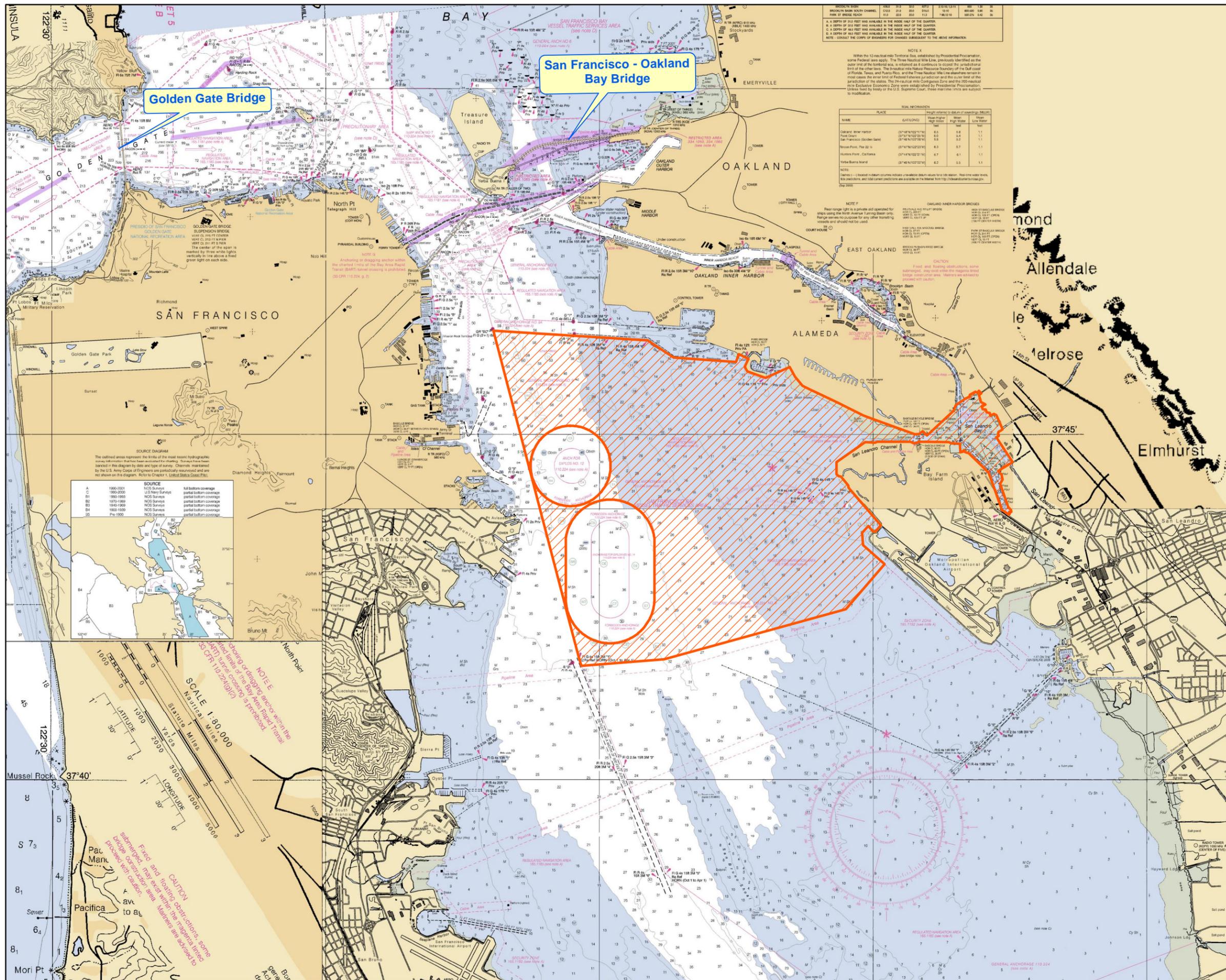


Figure 2-7 Lightering Area
 California State Lands Commission
 Amorcio Marine Oil Terminal Lease
 Consideration Project

Anchorage 9

2/13/2013

1 inch = 2 mile

1:125,000 mi



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- 1 • Pressure relief valves are inspected, serviced, tested to confirm the set pressure,
2 and retagged on an interval that is determined for each relief valve. The typical
3 interval for inspection and maintenance is 1 year.
- 4 • The fabrication and inspection requirements of American Society of Mechanical
5 Engineers B31.3 are met for process piping. After installation of new piping, all butt
6 welds are inspected using a combination of visual, radiographic, and hydrostatic
7 testing techniques. All socket welds are inspected using a combination of visual,
8 radiographic, dye penetrant, magnetic particle, and hydrostatic inspection
9 techniques. Baseline ultrasonic thickness measurements are taken upon
10 installation.
- 11 • Routine maintenance of lighting, bollards, life rings, etc. occurs as needed.

12 **2.5.1 Inspection Programs**

13 Facility inspections are performed by the USCG, BAAQMD, and CSLC. The BAAQMD
14 has the authority to issue Notices of Violation as well as take more severe enforcement,
15 if warranted. The USCG and CSLC have jurisdiction over wharf operations. The CSLC
16 Marine Facilities Division conducts quarterly and annual facility inspections and verifies
17 instrument charts and gauge readings that must meet State and federal standards. In
18 addition to agency inspections, the Refinery self-certifies its own maintenance and
19 inspections of the facility. The Terminal equipment inspection program consists of annual
20 component inspections and structural inspections of the wharf, approach trestle, and
21 associated pipelines. Structural and pipeline inspections are routine components of
22 facility operation. The Refinery also contracts third-party inspectors, as needed, to
23 complete additional inspections for operational safety, facility integrity, and regulatory
24 compliance purposes.

25 Comprehensive inspections of all Amorco Terminal mechanical, instrumental, electrical,
26 and structural systems are performed in accordance with MOTEMS requirements.
27 Inspection reports are transmitted to the CSLC Marine Facilities Division upon
28 completion. MOTEMS audits are completed and transmitted to the CSLC Marine Facilities
29 Division on a triennial basis. Audit results can result in additional rehabilitation,
30 maintenance, or monitoring, as needed. In accordance with MOTEMS, post-event
31 inspections are also performed after significant, potentially damage-causing events.

32 **2.5.2 Maintenance Dredging**

33 The ship berthing area north of the Terminal is dredged periodically to maintain a depth
34 of approximately 48 feet below MLLW, although the Terminal's operating limits indicate
35 that a minimum water depth of 44 feet must be maintained. Bathymetric surveys are
36 conducted quarterly and maintenance dredging is only conducted as required to maintain
37 minimum required depths. The last Amorco dredging event, conducted in 2005, entailed
38 removal of 500 cubic yards of spoils. Spoils removed in 2005 were disposed at the

1 Hanson Aggregate site, located north of Waterfront Road just west of Pacheco Creek, in
2 accordance with Amorco Terminal Water Quality Certification requirements of the San
3 Francisco Bay Regional Water Quality Control Board (RWQCB). Scheduled maintenance
4 dredging is known sufficiently in advance and Tesoro would continue to comply with
5 applicable permits to ensure appropriate assessments are conducted prior to conducting
6 maintenance-related dredging. Dredged spoils are tested and managed according to
7 permits issued by jurisdictional agencies, including the CSLC, U. S. Army Corps of
8 Engineers, San Francisco Bay Conservation and Development Commission, and San
9 Francisco Bay RWQCB.

10 **2.6 EMERGENCY RESPONSE**

11 **2.6.1 Emergency Shutdown**

12 Transfer operations at the Amorco Terminal may be suspended when any of the following
13 conditions has occurred:

- 14 • breakdown or loss of communication between operator and vessel;
- 15 • oil spillage on deck or to surrounding waters;
- 16 • fire/explosion (on vessels or on Terminal);
- 17 • excessive wind, current, or passing vessel conditions that compromise safe
18 mooring management of vessels;
- 19 • marine incidents such as collision or impending collision, close-passing vessels
20 that create surge off the dock, and/or personnel incidents on board that threaten
21 the safe transfer of oil;
- 22 • slack in mooring lines;
- 23 • significant earthquake or other natural events (e.g., tsunami) that may compromise
24 the safe transfer of oil; or
- 25 • vessel drifting off-spot, affecting safe use and operation of the transfer hoses.

26 Should an emergency occur while a vessel is discharging, the TPIC will use radio, voice
27 communication, or air horn to notify the tank vessel to immediately shut down transfer
28 operations, per California Code of Regulations, Title 2, section 2340, including the
29 shutdown of pumps and closing of valves on board the vessel. Shut-off valves, both
30 manual and motor operated, are located on the wharf to close off the transfer hoses and
31 the crude lines connected to the shore pumps and tankage. Isolation valves for all transfer
32 lines are located onshore at the end of the approach trestle. If the ship loading-hose
33 connection breaks loose while pumping oil offshore, block valves, located on the wharf,
34 stop flow of oil from the shore facility into the water.

1 The TPIC will notify on-site security staff immediately, and if needed, Tesoro's Emergency
2 Medical Technicians would be dispatched from the Refinery and the city of Martinez Fire
3 Department would be notified. Subsequently, the USCG and the ship's agent would be
4 notified. In the event of an oil spillage, agencies would be notified in accordance with
5 Tesoro's Operations Manual and the Oil Spill Contingency Plan.

6 **2.6.2 MOTEMS Tsunami Considerations**

7 The National Oceanic and Atmospheric Administration (NOAA) operates two tsunami
8 warning centers in the United States: The West Coast/Alaska Tsunami Warning Center
9 (WCATWC) and the Pacific Tsunami Warning Center. The two tsunami warning centers
10 collaborate to provide tsunami warning service and mutual backup to coastal regions in
11 the United States and in other countries worldwide. The WCATWC Area of Responsibility
12 includes the United States West Coast where the Amorco Terminal is located. The
13 WCATWC operates 24 hours every day and records data from approximately 600 seismic
14 stations that are funded and operated by different agencies, including the U.S. Geological
15 Survey, Global Seismic Network, and NOAA. An earthquake that activates an alarm
16 initiates an earthquake and tsunami investigation that includes automatic locating and
17 characterization of the earthquake, earthquake analysis and review, sea-level data
18 analysis and tsunami forecasting, and dissemination of information to the appropriate
19 emergency management officials and systems. Notifications issued by the WCATWC are
20 communicated directly via cell phone to Tesoro personnel responsible for marine
21 operations. Tesoro personnel take appropriate action as required to insure personnel
22 safety and to minimize potential impact to the environment and equipment. These actions
23 may include stopping oil transfer, disconnecting hoses, and calling for tugs to hold the
24 vessel securely to the Amorco Terminal or assist in setting sail.

25 Per MOTEMS, Tesoro maintains a Tsunami Response Plan that considers the possible
26 effect of tsunamis on the Amorco Terminal.

27 **2.6.3 MOTEMS Sea-level Rise Considerations**

28 MOTEMS (Cal. Code Regs., tit. 24, § 3103F.5.3.4) requires that each terminal consider
29 the predicted sea-level rise over the remaining life of a terminal. Tesoro has and will
30 continue to consider sea-level rise in Amorco Terminal assessments.

31 Tesoro conducts hydrographic surveys at the Amorco Terminal on a quarterly basis and
32 conducts underwater and above water structural MOTEMS inspections. These surveys
33 and inspections would over time detect increased water depth and potential corrosion at
34 higher-elevation splash zones. The Amorco Terminal Operating Limit diagrams will be re-
35 evaluated when subsequent MOTEMS audits deem the sea-level rise to be significant
36 enough to impact operations.

1 **2.6.4 Amorco Terminal Oil Spill Response Capability**

2 Table 2-3 lists available oil spill response equipment, as identified in Tesoro's Amorco
3 Marine Oil Terminal Oil Spill Response Plan (2008). Should an oil spill occur, equipment
4 listed in the table would be used during an initial response to the spill.

5 Tesoro has contracted with Bay Area Ship Services to assist with initial oil spill response
6 services, including the immediate execution of approximately 600 feet of harbor boom in
7 approximately 30 minutes. In addition, Tesoro contracts with Marine Spill Response
8 Corporation (MSRC) to serve as the primary Oil Spill Response Organization contractor
9 in its Oil Spill Response Plan for offshore, onshore, and shallow-water response services.

10 MSRC maintains an extensive inventory of privately owned spill response equipment.
11 This equipment is solely dedicated to spill response, and is stored and maintained at
12 MSRC's 51 equipment pre-position sites across the United States. MSRC's capabilities
13 are augmented by a network of over 90 participants in the Spill Team Area Responders
14 program, an affiliation of environmental response contractors located throughout the
15 country.

16 The CDFW's Office of Spill Prevention and Response and the USCG issue the Area
17 Contingency Plan, which provides guidance on sensitive sites; initial response
18 techniques; and response requirements for the type of boom, skimmers, and number of
19 personnel. Should a spill occur, Tesoro would comply with all federal and State response
20 plans.

21 Tesoro's Amorco Marine Oil Terminal Oil Spill Response Plan specifies that the following
22 response equipment and testing procedures must be implemented.

- 23 • Containment Boom: During semi-annual boom deployment exercises, boom shall
24 be inspected for signs of wear or structural deficiencies. If tears in fabric or rotting
25 of fabric are observed, the boom shall be repaired or replaced. In addition, end
26 connectors shall be inspected for evidence of corrosion. If severe corrosion is
27 detected, equipment shall be repaired or replaced.
- 28 • Response Boats: Response boats shall be put in the water and engines shall be
29 started at least quarterly. If any mechanical problems are detected, they shall be
30 addressed or repaired in a timely manner.
- 31 • Other Equipment: Other response equipment shall be inventoried and inspected
32 to ensure that the stated quantities are in inventory and in proper working order.
33 Documentation of equipment inspection and deployment exercises are maintained
34 at the facility.

1

Table 2-3: Amorco Terminal Oil Spill Response Equipment

Type/Model	Quantity	Size ¹	Deployment Time (hours)	Location
Boom trailer	1	7 ft by 15 ft	1	Boat house
Containment boom with universal connectors	1,000 ft	8 ft by 24 ft	1	Boat house
Miscellaneous hand tools	Various	Various	1	Boat house
Personal Protective Equipment (PPE) Trailer (Model No. C122)	1	8 ft by 12 ft	1	Boat house
Portable generator (Model No. EX-1000)	1	1000 W, 4 cycles, 3600 rpm	1	Boat house
Jon boat (Vessel No. CF 4344 JY)	1	12 ft	1	Boat house
Johnson outboard motor with gas tank	1	15 hp	1	Boat house
	1	9.9 hp	1	Boat house
Miscellaneous PPE	Various	Various	1	Boat house
Miscellaneous equipment and absorbents	Various	Various	Various	Various
Miscellaneous hand tools	Various	Various	1 to 4	Boat house
Boat, V-hull with trailer	2	12 ft	1 to 4	Boat house
Jon boat	3	10 ft, 12 ft	1 to 4	Boat house
Boat motors	4	15 hp	1 to 4	Boat house
	1	9.9 hp	1 to 4	Boat house
	1	20 hp	1 to 4	Boat house
Containment boom with universal connections	1,200 ft	8 by 24	2 to 4	Avon wharf
	1,000 ft	9 by 9		
	2,400 ft	8 by 24	--	Amorco wharf
	1,000 ft	4 by 8	1 to 4	Boat house
PetroMesh with oil snares (cases) "pom-poms"	10	3 ft	1 to 4	Boat house
Type 270 sorbent sausage	105	8 in by 40 ft bag	1 to 4	Boat house
	16	8 in by 40 ft bag	1 to 4	Avon wharf
	13	8 in by 40 ft bag	--	Amorco wharf
Type 151 sorbent sheets	100	100 per package	1 to 4	Boat house
	46	100 per package	1 to 4	Avon wharf
	14	100 per package	--	Amorco wharf
Type 126 sorbent sweeps	80	100 ft per package	1 to 4	Boat house
	48	100 ft per package	1 to 4	Avon wharf
	25	100 ft per package	--	Amorco wharf
Type 100 absorbent rolls	35	100 ft per package	1 to 4	Boat house
	5	100 ft per package	--	Avon wharf
	5	100 ft per package	--	Amorco wharf

2.0 Project Description

Type/Model	Quantity	Size ¹	Deployment Time (hours)	Location
Vessels "Avon I" Munson Hammerhead Serial No. ALF with Volvo/Penta AQAD 42/290 single prop motors. <ul style="list-style-type: none"> • Motor Serial Nos. 2204132960, Stern Drive Serial Nos. 3102051898 • Motor Serial Nos. 2204132936, Stern Drive Serial Nos. 3102051897 	1	30 ft 200 hp 200 hp	1	Martinez Marina
Avon II, Make: Kvichak work boat	1	24 ft	1	Martinez Marina
Pacific Trailer, Serial No. 40R1A2LJ49A028795. License No. 4KR3764	1	6 ft by 24 ft	1	Boat house
Yamaha 150 TXRX, Serial Nos. 6G4X-050267 & 6 KOX-297780 Motor Serial Nos. G03110184 & G03110162 (1999)	2	150 hp	1	Martinez Marina
Whaler III, Make: Boston Whaler (1979), Model: BWCC 7220. Vessel No. C9091 GK. Work Order No. 88482. (Back-up for Avon I, II or IV when out for service)	1	17 ft	2	Boat house
Brough Trailer. Model No. 72, Serial No. 251198	1	12 ft	2	Boat house
Pacific Trailer. Model No. 72, Serial No. 251198	1	12 ft	2	Boat house
Johnson 50 (1990)	2	50 hp	2	Avon wharf
SV I, Make: Avon (1992), Model S4. 65 RIBS, Vessel No. CF4908 JZ. Work Order No. 86649	1	13 ft	2	Boat house
Calkins Trailer, License No. 1DW9210	1	13 ft	2	Boat house
SV II, Make: Avon (1992), Model S4. 65 RIBS, Vessel No. CF5089 ND. Work Order No. 86647	1	13 ft	2	Boat house
E-Z Loader Trailer, Model EZ14-16, License No. 1DX5714	1	13 ft	2	Boat house

Source: Tesoro's Amorco Marine Oil Terminal Oil Spill Response Plan 2008

¹ Units of Size: ft = feet; hp = horsepower; rpm = revolutions per minute; W = watts; in = inch

² Discontinued, remaining inventory on hand

1 **2.6.5 Process Safety Controls**

2 The objective of the Amorco Terminal control systems is to provide controls to transfer
3 crude oil from a ship docked at the Amorco Terminal to onshore tankage both reliably and
4 safely while minimizing environmental concerns. The controls to meet these objectives
5 consist of the following systems and subsystems:

- 6 • isolation valve monitoring and control system,
- 7 • crude metering system,
- 8 • mooring line tension monitors,
- 9 • process safety equipment, and
- 10 • fire protection system.

11 Descriptions of these systems are provided below.

12 **Isolation Valve Monitoring and Control System**

13 Amorco Terminal isolation valves are motor-operated valves (MOV) equipped with
14 Limitorque actuators, push-button controls, and status lights. Valves are controlled via
15 Local Control Panels located in offshore buildings (refer to Section 2.3.1). Remote
16 switches are also located at each MOV so that valves can be manually opened or closed
17 if required. MOVs located at the unloading manifold can close within 30 seconds, per
18 CSLC requirements.

19 As discussed in Section 2.4.7, crude oil is pumped from the Amorco Terminal to onshore
20 tankage via pumps located on the vessels. Pump and over-pressurization protection for
21 the vessel and associated discharge lines are provided by the vessel. Thermal relief to
22 the slops system is provided via relief valves located on each of two 10-inch discharge
23 lines. Pressure transmitters on the crude line display pressure in the control room and
24 alert operators to abnormal conditions. Under emergency conditions, Amorco Terminal
25 operators would alert the ship and shut down the transfer.

26 Two 10-inch hoses used for unloading crude from the vessel connect to the two 10-inch
27 discharge lines, each equipped with its own MOV. The purpose of the two 10-inch
28 manifold MOVs is to isolate the wharf from the tank fill lines in the event of a leak or a fire.
29 As the valves are located within the zone of a potential wharf fire, they are fireproofed.
30 These are high-performance valves, specially designed for fast closure (under 30
31 seconds). In addition to the two 10-inch isolation valves, another isolation valve is
32 provided on the 20-inch line at the Y on the wharf approach, and another 20-inch MOV is
33 located onshore.

34 The Local Control Panels can open and close the MOVs on the wharf and can close the
35 20-inch MOV onshore. In addition to these Local Control Panels, offshore control panels

1 receive status information from all isolation valves and can be used to open or close the
2 MOVs, as needed.

3 **Crude Metering Skid System**

4 A new system to meter the amount of crude being discharged from a vessel was installed
5 in 2007. This crude metering skid, which is located just downstream from the onshore
6 Jurisdictional Valve, also analyzes the crude for water. There are two Instrument Analyzer
7 overview screens available to assist the TPIC in monitoring the process of safely
8 discharging crude oil feedstock. In addition to the metering skid display, the screen also
9 shows the status of the on-wharf fire pump, high-pressure alarm settings, and sump level.

10 **Mooring Line Tension Monitors**

11 This system is designed to continuously monitor the tension of vessel's mooring lines
12 while moored at the Amorco Terminal. Low and high settings are manually set at each
13 hook (current settings are 1 ton and 25 tons). An alarm at the mooring hook will sound if
14 either one of the parameters are exceeded.

15 A foghorn is also provided that activates manually using an on/off switch. Sensors for
16 wind direction and speed, as well as water current direction and speed, are displayed, as
17 required by the USCG and CSLC.

18 **Process Safety Equipment**

19 Process safety equipment is provided as a function of the process design. Relief valves
20 protect vessels and pipelines from over-pressuring. Fail-safe valves assume their
21 designed positions (closed/open) in case of incorrect pressure or loss of electrical power,
22 or instrument air. These features provide protection against over-pressuring of vessels or
23 lines and potential loss of containment.

24 Alarms are installed at specific points in the process to monitor parameters critical to the
25 proper operation of the unit. Exceeding a set point, altering a particular process, or
26 shutting down equipment can cause an alarm. These alarms also provide the operator
27 with a forewarning of the conditions that, if left uncorrected, may activate specific
28 automatic process responses such as relief valve opening, automatic shutdowns
29 (interlocks), etc. Some alarms are connected to an interlock as part of the safety design.
30 When activated, these interlocks perform specific automatic actions such as closing or
31 opening valves, de-energizing pumps or other equipment, or preventing start-up of
32 equipment.

33 Equipment and vessels are protected from over-pressuring by Pressure Safety Valves
34 (PSVs) and by locking open valves to insure an open relief path. At the Amorco Wharf
35 PSVs relieve into low-pressure piping systems that have an open path back to tankage.

1 Over-pressure conditions are avoided when PSVs automatically open in response to
2 process pressures reaching the PSVs set points. The PSVs automatically close when
3 process pressures drop back below the PSVs set points. PSVs associated with pipelines
4 and the Amorco wharf are replaced yearly per CSLC and USCG regulations to ensure
5 correct operation.

6 **Fire Protection System**

7 The Amorco Terminal is equipped with firewater and foam systems that can be activated
8 in the event of a fire. Firewater is currently supplied by the Shell Refinery. Fire protection
9 at the Amorco Terminal is provided by the following equipment:

- 10 • onshore firewater pump that takes suction from land-based tankage;
- 11 • offshore firewater pump that takes suction from the Suisun Bay;
- 12 • two fireboat connections that extend over water and tie into the Amorco Terminal
13 firewater header;
- 14 • multiple hose reels, monitors (portable and fixed), hydrants, and foam tanks
15 located at the Amorco Terminal;
- 16 • hydrants and monitors located along the approach trestle, spaced at a maximum
17 of 150-foot intervals;
- 18 • two elevated monitors with foam supply tanks that can be controlled both manually
19 and automatically from remote locations (back-up foam supply line that can be
20 supplied from onshore pumper trucks);
- 21 • offshore subdeck sprinkler systems, located underneath the firewater pump; and
- 22 • multiple portable and wheeled dry chemical extinguishers at the Amorco Terminal.

23 The offshore and onshore firewater protection systems are interconnected and work in
24 conjunction to maintain firewater pressure. San Francisco Bay water from the vertical
25 firewater pump located on the wharf is used as the primary source of water. If a low-
26 pressure situation occurs, the wharf pump will start automatically. If the low-pressure
27 situation were to continue, the secondary onshore firewater pump would start and provide
28 fresh water from the two firewater tanks onshore.

29 A 14-inch line supplies firewater from the onshore firewater tanks to the Amorco Terminal
30 (refer to Figure 2-3). The line runs the length of the approach trestle to the extreme
31 eastern end of the wharf, ending with a valve and fireboat connection for hook up to the
32 firewater system. A 12-inch line splits off of the 14-inch line and supplies firewater to the
33 western end of the wharf. This line also has a valve and fireboat connection. There is also
34 a 6-inch line that comes off the 14-inch line near the eastern end of the wharf. Monitors
35 and hose reels are installed at reasonable intervals. Additional dry hydro-chem carts are
36 placed along the wharf near the elevated monitors.

1 Two 30-foot-tall monitors located on each side of the unloading manifold have automatic
2 and remote start-up capabilities. These monitors are capable of vertical and horizontal
3 sweeps with foam water mixers and adjustable-nozzle water patterns. A 1,000-gallon tank
4 containing 1 percent foam is located near each monitor. There is enough foam to fight a
5 fire for 1 hour. If a fire lasts more than 1 hour, emergency equipment can be hooked up
6 to a 3-inch dry line, and 3 percent foam can be pumped onto the wharf. Portable trailers
7 filled with 3 percent foam are stationed at the shore end of the wharf. Solenoid valves are
8 used to open the separate 1 percent and 3 percent foam lines. Flow of water/foam is rated
9 at 1,500 gallons per minute and 100 pounds per square inch. Two control panels allow
10 crews to remotely fight fires. A manual control unit is also located at the monitors.

11 In addition, a sprinkler system has been installed at the berth, under the containment pan,
12 on the eastern end of the wharf. This is necessary because foam and water sprayed on
13 top of the wharf will not flow under the wharf due to the (intentional) sealing that the pan
14 creates. At appropriate spacing along the wharf approach and berth, holes have been cut
15 in the wooden wharf deck planking (covered by metal plates) to allow personnel to lower
16 cellar nozzles to fight fires below deck. Part of the under-deck sprinkler system also
17 protects the firewater pump shelter that houses the pump, motor, gearbox, and support
18 structures in case of a fire.

19 Fire protection equipment and procedures, including fire equipment function, features,
20 operation, and arrangement, are compiled in the *Amorco Marine Oil Terminal Fire*
21 *Protection Plan (2011)*. This plan includes photos and maps documenting the locations
22 of fire-protection equipment for Amorco Terminal personnel. Fire response is performed
23 by Tesoro's Emergency Response Team (ERT) on-site at the Golden Eagle Refinery.
24 Back-up support may be provided under mutual aid from other nearby refineries. ERT
25 firefighters receive an initial 40-hour basic fire-response training taught at the Golden
26 Eagle Refinery, as well as annual 32-hour live-fire training at an off-site fire school.
27 Monthly refresher and enhancement trainings are provided for ERT day workers and
28 twice per quarter for ERT shift workers.

29 Tesoro's personnel and ERT is not responsible for shipboard fire management, as that is
30 the responsibility of the vessel's crew. In the event of a shipboard fire, Tesoro would
31 provide shore-side assistance from the Amorco wharf, in accordance with Tesoro's
32 Operations Manual and Fire Response Plan. All other onshore or offshore fires at the
33 Amorco Terminal would be managed by Amorco Terminal personnel and the ERT, in
34 accordance with Tesoro's Operations Manual and Fire Response Plan.