

# **2023 Marine Mammal Monitoring Plan**

## **Chevron Richmond Refinery**

### **Long Wharf Maintenance and Efficiency Project**



#### **Chevron Richmond Refinery – Capital Projects**

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## LIST OF ACRONYMS AND ABBREVIATIONS

BA	biological assessment
CBC	California Building Code
CSLC	California State Lands Commission
dB	decibel
EFH	Essential Fish Habitat
EIR	Environmental Impact Report
ESA	Federal Endangered Species Act
IHA	Incidental Harassment Authorization
μPa	microPascal
MMPA	Marine Mammal Protection Act
MOTEMS	Marine Oil Terminal Engineering and Maintenance Standards
NMFS	National Marine Fisheries Service
PSO	Protected Species Observer
RMS	root mean square
SPL	sound pressure level
WMEP	Wharf Maintenance and Efficiency Project

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# Chapter 1

## Introduction

The Chevron Richmond Refinery Long Wharf (Long Wharf) is the largest marine oil terminal in California. The Long Wharf has six berths for receiving raw materials and shipping final products, and has existed in its current location since the early 1900s. Marine loading arms and gangways were installed in 1972. Since then it has become increasingly difficult to obtain spare parts for these features. Changes in the vessel fleet (e.g., larger and taller vessels) since the original installation necessitated changes in the configuration of the loading arms and gangways.

The Berth 2 fender system (timber pile and whaler) was designed and installed in 1940. Marine loading arms, gangways, and fender systems at Berths 1, 3 and 4 were installed in 1972. The marine loading arms were recently replaced between 2016 and 2018. The Berth 4 fender panels were replaced in 2011 and the Berth 1 fender panels were replaced in 2012. The existing configuration of these systems have limitations to accepting more modern, fuel efficient vessels with shorter parallel mid-body hulls and in some cases do not meet current MOTEMS requirements. The Long Wharf Maintenance and Efficiency Project (LWMEP, Project) was designed to upgrade the Wharf to bring it to current codes.

Construction of the Project began in 2018 and was initially expected to be completed in 2-3 years. Since 2018, a number of Project elements have been completed under previous IHAs, including installation of fendering systems and a seismic retrofit of Berth 4. The need for unanticipated and unscheduled dredging in 2019 prior to installing piles for the Berth 4 seismic retrofit caused a one-year delay in the Project. The 2020 COVID-19 pandemic, and associated work restrictions, have caused further schedule delays, pushing back the completion date of various project elements into 2023 and beyond. This Marine Mammal Monitoring Plan covers elements at Berth 1 to be conducted in 2023. The Project activities that require marine mammal monitoring include installation and extraction of piles using both vibratory and impact-driving methods.

### 1.1 Regulatory Requirements

Chevron is consulting with the National Marine Fisheries Service (NMFS) for an Incidental Harassment Authorization (IHA), pursuant to the Marine Mammal Protection Act (MMPA) of 1972. Under the MMPA, unauthorized take (harass, hunt, capture, kill or collect, or attempt to harass, hunt, capture, kill or collect) of any marine mammal is prohibited. In 1994, amendments to this act statutorily defined two levels of harassment. 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.

Level B harassment is defined as harassment having potential to *disturb* marine mammals by causing disruption of behavioral patterns such as breathing, nursing, breeding, feeding, and sheltering.

In 2010, NMFS established interim thresholds regarding the exposure of marine mammals to high-intensity noise that may be considered take under the MMPA. Updated NOAA guidance on assessing the effects of underwater noise on marine mammals for agency impact analysis was adopted in 2016 and revised in 2018 (NMFS 2018). The 2018 guidance includes sound thresholds for slight injury to an animal's hearing, or PTS (Level A Harassment). The underwater sound pressure threshold for slight injury or PTS (Level A harassment) is a dual metric criterion for impulse noise (e.g., impact pile-driving), including both a peak pressure and cSEL threshold, which is specific to the species hearing group (i.e., high-frequency cetaceans [i.e., harbor porpoise], mid-frequency cetaceans [i.e., bottlenose dolphin], low-frequency cetacean [i.e., gray whale], phocids [i.e., Pacific harbor seal and northern elephant seal], and otariids [i.e., California sea lion and northern fur seal]). For continuous noise (e.g., vibratory pile extraction or driving), the PTS threshold is based on cSEL for each species hearing group.

The 2010 thresholds for Level B behavioral harassment levels are still applicable: 160 dB RMS for impulse sounds and 120 dB for nonimpulsive or continuous sounds. Level B Behavioral harassment is considered to have occurred when marine mammals are exposed to noise of 160 dB RMS or greater for impulse noise and 120 dB RMS for continuous noise. Table 1-1 summarizes these various criteria for Level A and Level B harassment.

To comply with the MMPA, Chevron has received an IHA to authorize the potential Level B harassment of the following marine mammal species in San Francisco Bay: California sea lion (*Zalophus californianus*), Pacific harbor seal (*Phoca vitulina*), harbor porpoise (*Phocoena phocoena*), northern elephant seal (*Mirounga angustirostris*), northern fur seal (*Callorhinus ursinus*), bottlenose dolphin (*Tursiops truncatus*), and gray whales (*Eschrichtius robustus*).



<b>Hearing Group and species considered in this IHA</b>	<b>Underwater Continuous Noise Thresholds (e.g., Vibratory Pile-Driving)</b>		<b>Underwater Impulse Noise Thresholds (e.g., Impact Pile-Driving)</b>		
	<b>Level A cSEL Threshold</b>	<b>Level B RMS Threshold</b>	<b>Level A Peak Threshold<sup>2</sup></b>	<b>Level A cSEL Threshold<sup>2</sup></b>	<b>Level B RMS Threshold</b>
Phocids (Pacific harbor seals, northern elephant seals)	201 dB	120 dB	218 dB	185 dB	160 dB
Otariids (California sea lions, northern fur seals)	219 dB	120 dB	232 dB	203 dB	160 dB
Low-Frequency Cetaceans (gray whales)	199 dB	120 dB	219 dB	183 dB	160 dB
Mid-Frequency Cetaceans (bottlenose dolphins)	198 dB	120 dB	230 dB	185 dB	160 dB
High-Frequency Cetaceans (harbor porpoises)	173 dB	120 dB	202 dB	155 dB	160 dB

Notes:

<sup>1</sup> The airborne disturbance guideline applies to hauled-out pinnipeds.

<sup>2</sup> Level A threshold for impulse noise is a dual criterion based on peak pressure and cSEL. Thresholds are based on the NMFS 2016 Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing.

cSEL = cumulative sound exposure level  
 dB = decibel  
 IHA = Incidental Harassment Authorization  
 N/A = Not applicable, no thresholds exist  
 NMFS = National Marine Fisheries Service  
 RMS = root mean square  
 sec = second

Underwater peak and RMS are re: 1 µPa; cSEL is re: 1 µPa<sup>2</sup>-sec; Airborne RMS is re: 20 µPa.

## 1.2 Purpose of the Monitoring Plan

The purpose of this Monitoring Plan is to establish procedures to ensure compliance with permit requirements, thereby avoiding serious injury (Level A harassment) of marine mammals and minimizing behavioral disturbance (Level B harassment) to the extent practicable. Lethal take of marine mammals is not expected to occur.

The objectives of the monitoring are to:

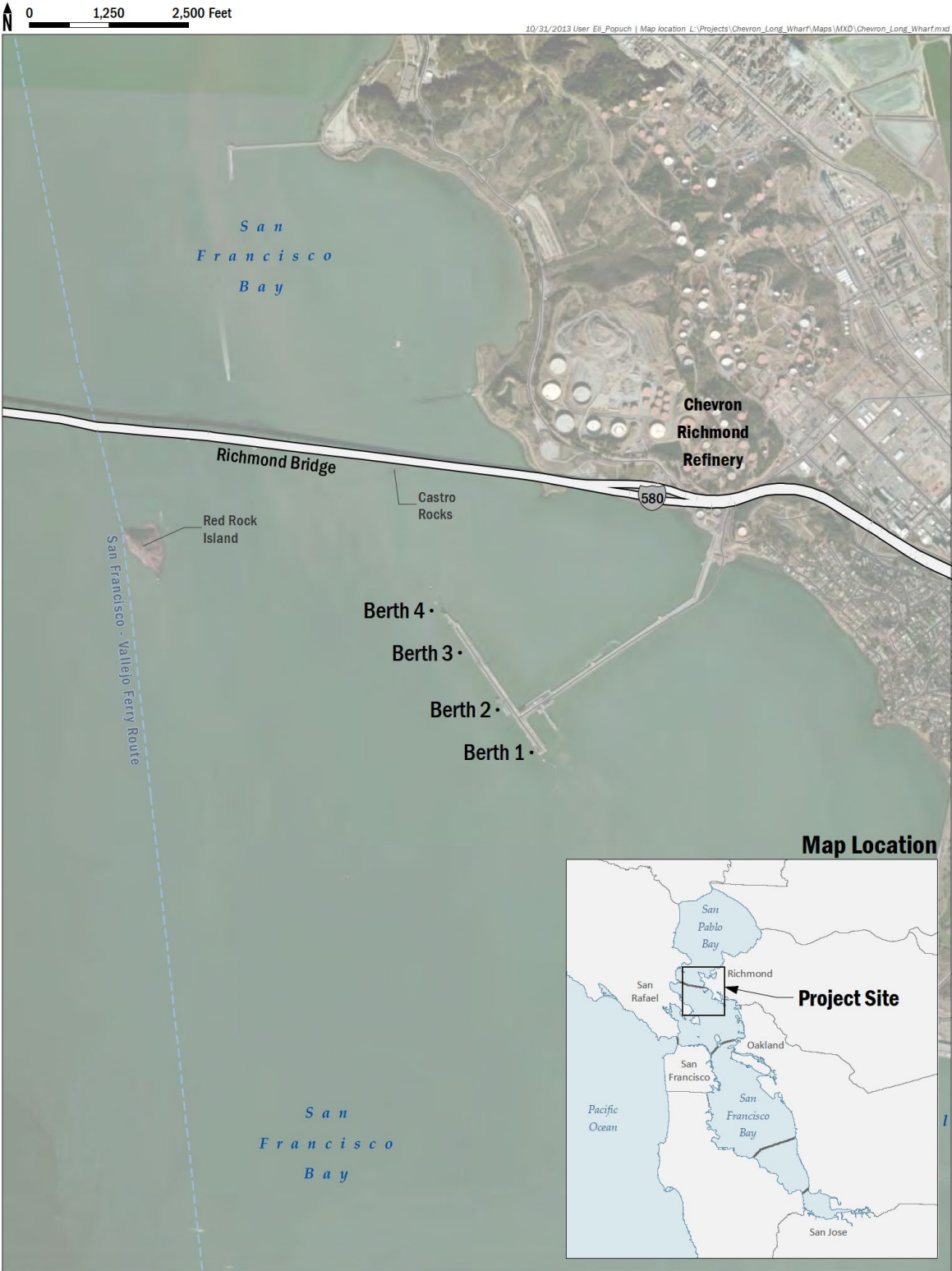
- Establish parameters to monitor site locations for the disturbance of marine mammals during the proposed Project, as described in Section 1.4.

- Avoid injury to marine mammals through visual monitoring of identified zones of influence (e.g., zones where Level A harassment criteria may be exceeded), and provide ancillary observations of marine mammals in adjacent work areas.
- Conduct field operations to obtain data as follows:
  - Make daily observations and record presence or absence of marine mammals.
  - Record marine mammal behavior observations.
  - Establish/confirm threshold distances delineated in the IHA request.

These objectives will be accomplished in accordance with the IHA and pertinent permit conditions for the LWMEP.

### **1.3 Project Location**

The Long Wharf is located in central San Francisco Bay just south of the eastern terminus of the Richmond-San Rafael Bridge in Contra Costa County. Figure 1 illustrates the project vicinity and specific location. Project activities would occur at Berth 1 while the Long Wharf remains in operation. To the north of Berth 1 are Castro Rocks, an established haul-out site for Pacific harbor seals.



**Figure 1 Project Location**

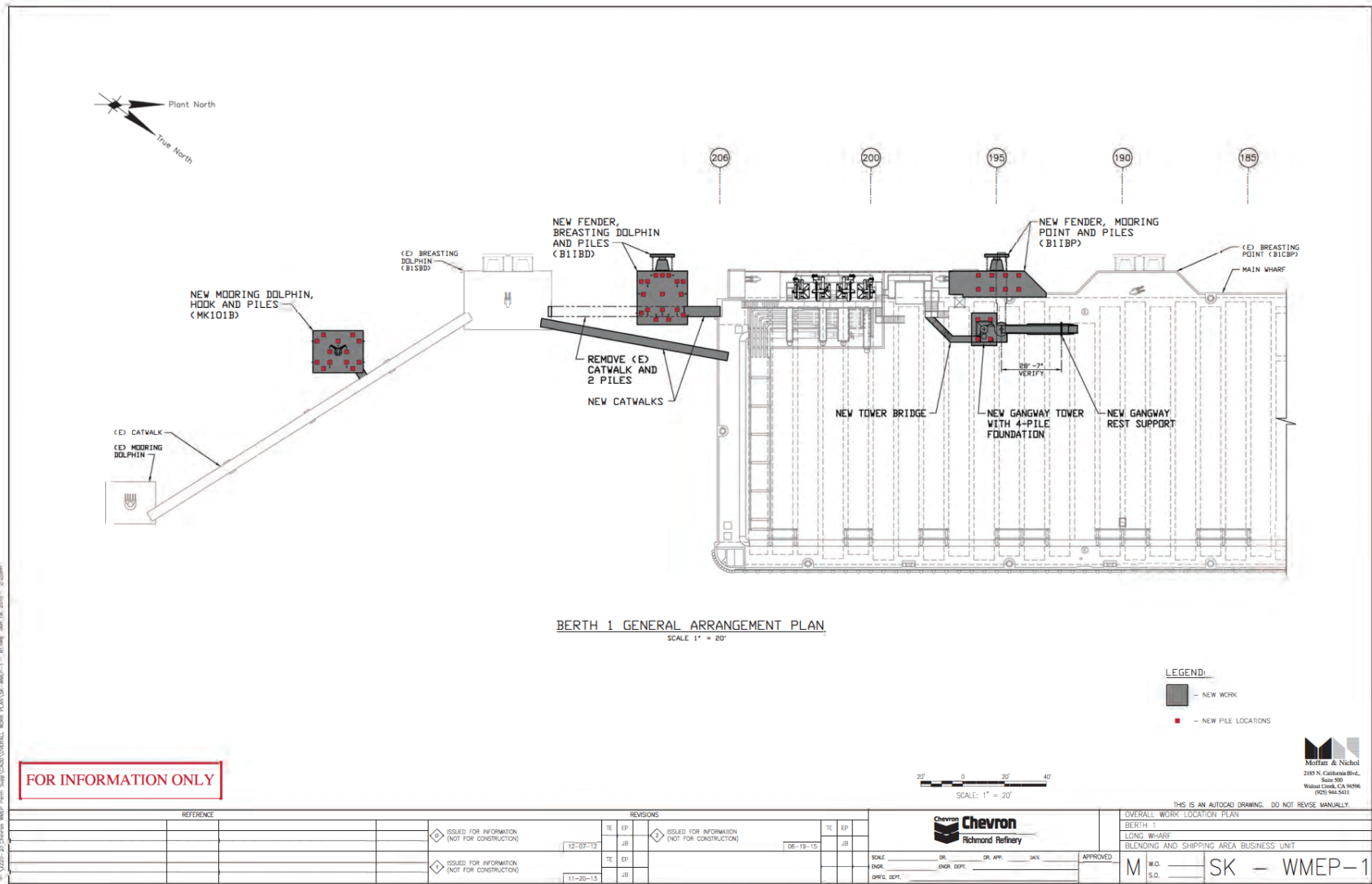
## 1.4 Project Description

The remaining modifications in 2023 involve modifications at Berth 1 (Figure 1). Modifications at this berth include the replacement of the Berth 1 gangway, mooring hook dolphin, and fenders to accommodate barges.

Modifications at Berth 1 include the following:

- Replace gangway to accommodate barges and add a new raised fire monitor (4 24-inch concrete piles).
- Construct a new 24' x 20' mooring dolphin and hook to accommodate barges (13 24-inch concrete piles).
- Construct a new 24' x 25' breasting dolphin (17 24-inch concrete piles) and 13' x 26' breasting point with standoff fenders (8 24-inch concrete piles) to accommodate barges. The new breasting dolphin will require removal of an existing catwalk and 2 18-inch concrete piles and replacing with a new catwalk at a slightly different location, and adding a short catwalk to provide access to the breasting dolphin.
- A portion of the existing gangway will be removed. The remaining portion is used for other existing services located on its structure.
- Construction of the new mooring and breasting dolphins will utilize temporary pile driving templates supported by a total of twelve 36-inch steel pipe piles. These piles would be removed following installation of the new mooring and breasting dolphins.

These modifications are shown on Figure 2.



**Figure 2 Berth 1 Project Features**

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## 1.5 Dates and Duration of Construction

Construction would be scheduled such that the Long Wharf remains operational during construction. Pile driving activities would occur within the San Francisco Bay NMFS work windows for listed fish species (June 1 through November 30). Pile driving and extraction planned during the 2023 work season, is provided in Table 1-2.

**Table 1-2: Berth 1 Pile Driving Summary for 2023 Work Season**

<b>Pile Type</b>	<b>Driver Type</b>	<b>Number of Piles</b>	<b>Number of Driving Days</b>
<b>Pile Driving:</b>			
36-inch steel pipe piles for temporary template	Vibratory	12	4
24-inch square concrete piles*	Impact	42	21
<b>Pile Extraction:</b>			
36-inch steel pipe piles for temporary template	Vibratory	12	4
18-inch square concrete piles	Vibratory	2	1

\*A bubble curtain attenuation system will be used for all impact driving.

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## **Chapter 2**

### **Species to be Monitored and Overview of Effects of Noise**

#### **2.1 Species Affected**

Although at least 35 species of marine mammals can be found off the coast of California, very few species venture into San Francisco Bay, and only Pacific harbor seals, California sea lions, and harbor porpoises make the Bay a permanent home. In recent years there have been increasingly common observations of harbor porpoises within San Francisco Bay. Small numbers of bottlenose dolphins, humpback whales, and gray whales are regularly sighted in the Bay during their yearly migration, though most sightings tend to occur in the Central Bay near the Golden Gate Bridge.

Pacific harbor seals are expected to be the most common marine mammal in the project vicinity, due to the proximity of a haul-out site for the species located approximately 2,500 feet north of Berth 4 (Figure 1). Castro Rocks is the largest harbor seal haul out site in the northern part of San Francisco Bay and is the second largest pupping site in the Bay (Green et al., 2002). During the molting season (typically June and July, and coinciding with the period when piles will be driven) as many as approximately 130 harbor seals have been observed using Castro Rocks as a haul out, as described in Section 3.1. Harbor seals are more likely to be hauled out in the late afternoon and evening, and are more likely to be in the water during the morning and early afternoon (Green et al., 2002). However, during the molting season, harbor seals spend more time hauled out and tend to enter the water later in the evening. Tidal stage is a major controlling factor of haul out usage at Castro Rocks with more seals present during low tides than high tide periods (Green et al., 2002). Therefore, the number of harbor seals in the vicinity of Castro Rocks will vary throughout the work period. Small numbers of California sea lion and harbor porpoise have also been sighted in the project vicinity.

#### **2.2 Overview of Effects of Noise on Marine Mammals**

Marine mammals use hearing and sound transmission to perform vital life functions. The introduction of noise (defined as unwanted or harmful sound) into their environment could disrupt these behaviors. Sound (hearing and vocalization/echolocation) serves the following four primary functions for marine mammals: 1) providing information about the environment; 2) communication; 3) prey detection; and 4) predator location. The distances at which project construction noises are audible depend on source levels, frequency, ambient noise levels, the propagation characteristics of the environment, and the sensitivity of the receptor (Richardson et al., 1995). The effects of underwater noise from pile extraction and driving on marine

mammals may include one or more of the following: masking of natural sounds, behavioral disturbance, temporary or permanent hearing impairment, or non-auditory physical effects (Richardson et al., 1995).

Marine mammals that occur in the project area would be exposed to airborne noise associated with pile extraction and driving that has the potential to cause harassment, depending on their distance from pile extraction and driving activities. Although airborne pile extraction and driving noise may be audible at the Castro Rocks haul-out location, noise levels would be below the NMFS harassment threshold. Pacific harbor seals and California sea lions may be exposed to airborne noise if they surface in proximity to pile extraction and driving work. Airborne noise would likely cause behavioral responses similar to those discussed above in relation to underwater noise. For instance, the noise generated could cause pinnipeds to exhibit changes in their normal behavior, such as causing them to move farther from the noise source.

Noises or disturbances that would typically flush animals in areas of low disturbance may not elicit a response at Castro Rocks, which is proximal to shipping lanes and the San Rafael Bridge. The seals at Castro Rocks have habituated to a degree to some sources of human disturbance such as large tanker traffic and the noise from vehicle traffic on the bridge, but often flush into the water when small boats maneuver close by (Kopec and Harvey, 1995).

The area of effect of a particular noise in the natural environment is also dependent on the background noise levels. Project related-noise that is masked by ambient noise is unlikely to have an effect on marine mammals. Typical underwater ambient noise levels for embayments with commercial and industrial boat traffic may exceed 140 dB RMS, with 133 dB RMS being recorded from Oakland Harbor (Caltrans, 2009). Noise levels would be higher when large vessels are operating in the vicinity. The San Francisco Bay commuter ferries that pass near the Long Wharf and between Red Rock Island and Castro Rocks, for instance, produce underwater noise levels of 152 to 177 dB peak (EIP Associates, 2006). Tanker ships, like those that operate out of the Long Wharf, typically produce underwater noise levels around 180 dB (McKenna et al., 2012).

## Chapter 3 Monitoring Methodology

This chapter discusses the measures that will be used to ensure marine mammals are not present in the zone of hearing loss, discomfort, or injury (Level A harassment) when pile driving activities are occurring. Specific measures include visual monitoring of the shutdown zone and visual monitoring for changes in the behavior of marine mammals in the surrounding areas visible to the monitor.

### 3.1 Monitoring Areas

The primary sources of noise produced during construction would be pile extraction and pile driving. This includes the installation of 24 -square- inch concrete piles and 36-inch temporary steel piles, and extraction of 18-inch concrete and the 36-inch temporary steel piles as described in Section 1.4. The Level B harassment zone will be monitored, to the extent practicable, to observe and record any behavioral responses that marine mammals have to pile driving activity and to record incidents of potential Level B harassment. Table 3--1 and 3-2 provides a summary of the harassment zones that are presented in the IHA.

<b>Table 3-1: Radial Distances to Level A Isopleths During Impact and Vibratory Driving</b>					
<b>Project Element Requiring Pile Installation</b>	<b>Distance to Level A Threshold [meters (feet)]</b>				
	<b>Low-Frequency Cetaceans</b>	<b>Mid-Frequency Cetaceans</b>	<b>High-Frequency Cetaceans</b>	<b>Phocid Pinnipeds</b>	<b>Otariid Pinnipeds</b>
<b>Impact Driving (with bubble curtain)</b>					
24-inch square concrete (2 per day)	31 (102)	1 (3)	37 (121)	17 (56)	1 (3)
<b>Vibratory Driving/Extraction</b>					
36-inch steel pipe pile installation and extraction (3 per day)	16 (52)	3 (10)	21 (69)	11 (36)	2 (7)
18-inch concrete pile extraction (2 per day)	6 (20)	1 (3)	9 (30)	4 (13)	<1 (3)

<b>Pile Type</b>	<b>Distance to Threshold 160/120 dB RMS (Level B)* meters (feet)</b>
<b>Impact Driving (with bubble curtain)</b>	
24-inch square concrete (2 per day)	74 (241)
<b>Vibratory Driving/Extraction</b>	
36-inch steel pipe pile installation and extraction (3 per day)	2,727 (8,945)
18-inch concrete pile extraction (2 per day)	7,356 (24,129)

In order to monitor the Level A harassment zone, shutdown zones are defined as an area within which shutdown of activity would occur upon sighting of a marine mammal (or in anticipation of an animal entering the defined area). A shutdown zone will be established which will include all of the area where underwater SPLs are expected to reach or exceed the cumulative SEL thresholds for Level A harassment as provided in 3-2. The shutdown zone includes all areas where underwater sound pressure levels are expected to reach or exceed the Level A harassment thresholds for marine mammals, rounded up to the next 10-meter interval.

During the impact and vibratory driving, the initial shutdown zones would be set to the distances provided for each hearing group in Table 3-3.

<b>Project Element Requiring Pile Installation</b>	<b>Low-Frequency Cetaceans</b>	<b>Mid-Frequency Cetaceans</b>	<b>High-Frequency Cetaceans</b>	<b>Phocid Pinnipeds</b>	<b>Otariid Pinnipeds</b>
<b>Impact Driving (with bubble curtain)</b>					
24-inch square concrete	40	10	40	20	10
<b>Vibratory Driving/Extraction</b>					
36-inch steel pipe pile installation and extraction	20	10	30	20	10
18-inch concrete pile extraction	10	10	10	10	10

### **3.2 Visual Marine Mammal Monitoring**

Monitoring of the cetacean shutdown zone and behavioral disturbance (Level B harassment) zone will be conducted by qualified NMFS approved protected species observers (PSOs). During pile driving, two PSOs will be present to monitor the applicable shutdown zones (Table 3-3) around each pile driving location as well as the portions of the Level B zone observable from the

Long Wharf. Pile driving work would be stopped whenever the PSOs are unable to observe the entirety of the shutdown zones

### **3.2.1 Baseline Monitoring**

The PSO(s) will conduct a one-day survey of the potential Level A and B harassment zones—no earlier than 7 days before the first day of construction—to establish baseline observations. Monitoring will be timed to occur during various tides (preferably low and high tides) during daylight hours. The information collected from baseline monitoring will be used for comparison with results of monitoring during pile driving activities.

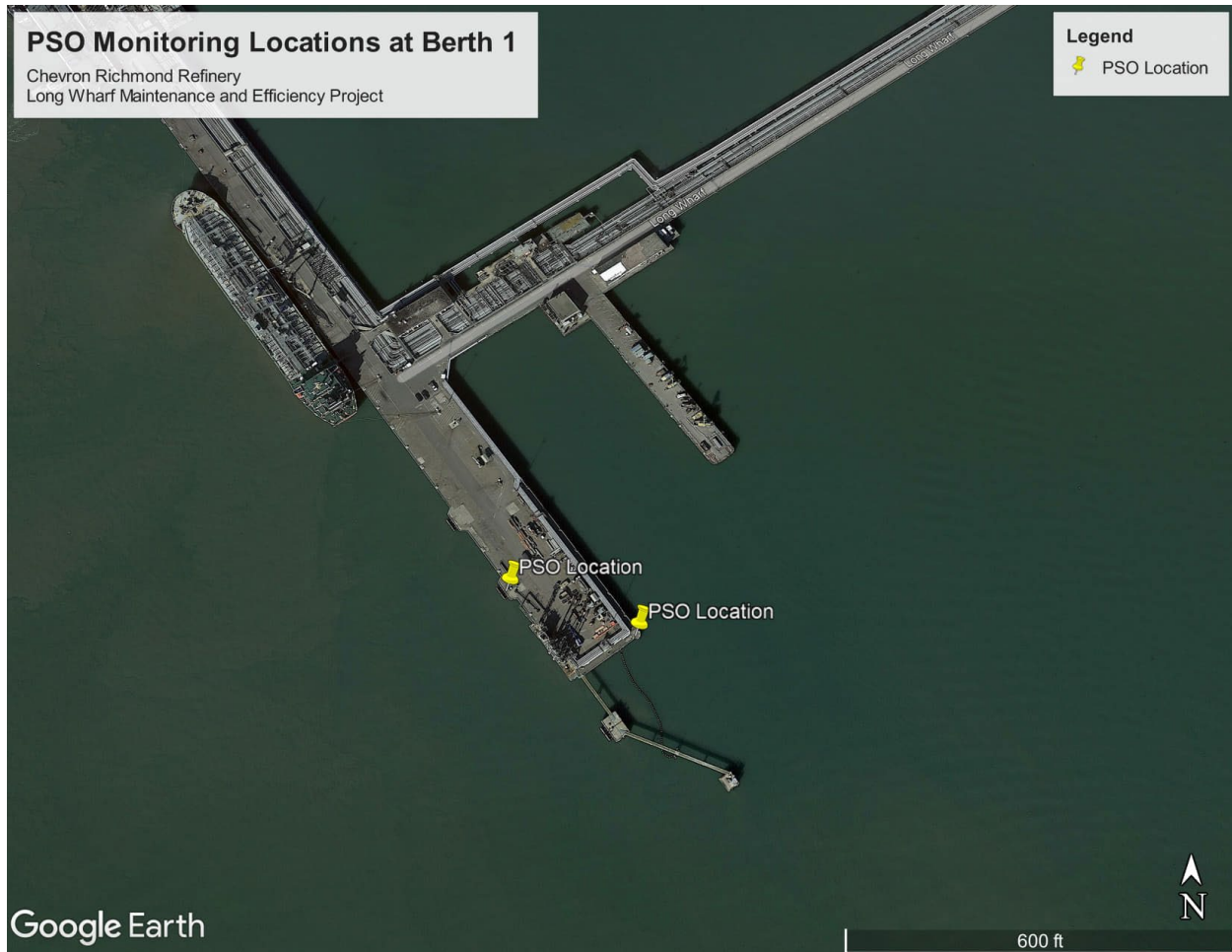
### **3.2.2 Construction Monitoring**

All pile driving activities and vibratory pile extraction require two PSOs to be present.

The shutdown zones will be monitored for 30 minutes before any pile driving activities to obtain visual confirmation that the area is clear of any marine mammals. Visual monitoring will occur from clear vantage points along the Long Wharf. Pile extraction or driving will not commence until marine mammals have not been sighted within the shutdown zone for a 30 minute period. If marine mammals are sighted in the shutdown zone, the start of pile driving activities will be delayed to allow them to move out of the area. If a marine mammal is seen above water and then dives below, the contractor will wait 15 minutes; and if the animal is not re-detected in that time, it will be assumed that the animal has moved beyond the shutdown zone. Pile driving activities include the time to install or remove a single pile or series of piles, as long as the time elapsed between uses of the pile driving equipment is no more than thirty minutes.

Monitoring will be conducted by qualified observers familiar with marine mammal species and their behavior. The observers will monitor the shutdown zones from the most practicable vantage point possible on the Long Wharf itself) to determine whether marine mammals enter the shutdown zone.

During work at Berth 1, PSOs will be stationed on the east and west edges of the Long Wharf, on elevated viewpoints if possible. See Figure 3 for representative monitoring locations. The PSO on the east has 180 degree views from the Long Wharf, north, south and east toward the shore and would have distant views of Castro Rocks. The PSO on the west would have 180 degree views, north to south, with views of San Francisco Bay to the west.



**Figure 3** PSO Monitoring Locations

Although airborne pile-driving RMS noise levels above the NMFS airborne noise thresholds will not extend to the Castro Rocks haul-out site, peak noise levels will be higher and may be audible over greater distances. It is expected that some pile-driving noise would be audible to harbor seals hauled out at Castro Rocks. However, the Castro Rocks haul out is subject to high levels of background noise from the Richmond Bridge, ongoing vessel activity at the Long Wharf, ferry traffic, and other general boat traffic. As a result, pile extraction and driving noise is not expected to regularly incite a reaction from hauled out harbor seals at Castro Rocks and would not cause incidental harassment. Intensive monitoring of the Castro Rocks site would likely cause more disturbance than the proposed Project.

### 3.2.3 Post-Construction Monitoring

The PSO will continue to observe the shutdown zone and surrounding areas for 30 minutes after pile driving stops.

### 3.2.4 Monitoring Data

Observations will be recorded, and will include the following, to the extent available:

- Name of PSO who sighted the animal(s) and PSO location and activity at time of sighting;
- Time of sighting;
- Identification of the animal (e.g., genus/species, lowest possible taxonomic level, or unidentified), PSO confidence in identification, and the composition of the group if there is a mix of species;
- Distance and bearing of each marine mammal observed relative to the pile being driven for each sighting (if pile driving was occurring at time of sighting);
- Estimated number of animals (min/max/best);
- Estimated number of animals by cohort (adults, juveniles, neonates, group composition, etc.);
- Animal's closest point of approach and estimated time spent within the harassment zone;
- Description of any marine mammal behavioral observations (e.g., observed behaviors such as feeding or traveling), including an assessment of behavioral responses thought to have resulted from the activity (e.g., no response or changes in behavioral state such as ceasing feeding, changing direction, flushing, or breaching);
- Number of marine mammals detected within the harassment zones, by species; and
- Detailed information about implementation of any mitigation (e.g., shutdowns and delays), a description of specific actions that ensued, and resulting changes in behavior of the animal(s), if any.
- Other acoustic or visual disturbances.

The reactions of pinnipeds will be recorded based on the following classifications: 1) no response; 2) head alert (e.g., looks towards the source of disturbance); 3) approaches in water (but does not leave); and 4) retreat or flush (e.g., leaves the area or flushes from the haul-out site). For cetaceans, any apparent change to heading, speed, or surfacing frequency would be recorded. Appendix A provides the Monitoring Data Sheets to be used for recording observations.

If an injured or dead marine mammal is found in the area, the event would be reported to NMFS within 24 hours. If accessible to the PSO, the carcass would be tagged; and if possible, the PSO would determine and record the species, age, and sex for reporting to NMFS.

### **3.2.5 Monitoring Equipment**

The following equipment will be used by the PSOs:

- A rangefinder capable of achieving an accuracy of  $\pm 5$  feet at a range of 100 feet;
- Binoculars;
- Radio or cell phone; and
- Monitoring Data Sheets.

The PSOs will use high-quality binoculars to monitor marine mammals at distant locations or along the jetty. A radio or cell phone will be used to coordinate with the construction contractor and other PSOs. To the extent practicable, digital video or 35-millimeter still cameras will be used to document the behavior and response of marine mammals to construction activities or other disturbances.



## **Chapter 4**

### **Coordination, PSO Qualifications, and Responsibilities**

Implementation of the monitoring program will involve close coordination among Chevron, the construction contractor(s), PSOs, and other field personnel. Chevron will hire appropriately trained field inspectors and PSOs and will be responsible for the timely review and reporting of monitoring data to pertinent regulatory agencies.

#### **4.1 Coordination Meeting**

Prior to the start of any pile driving activity, a coordination meeting will be held between the construction supervisors and crews, the marine mammal monitoring team, and Chevron staff. The purpose of the briefing will be to establish responsibilities, define the chains of command, discuss communication procedures, and review operational procedures. The Chevron construction manager will have the authority to stop or delay any construction activity, if deemed necessary by the PSOs. New personnel will be briefed before they join the work in progress.

#### **4.2 PSO Qualifications**

Monitoring of pile driving shall be conducted by qualified PSOs, who shall have no other assigned tasks during monitoring periods. Chevron shall adhere to the following conditions when selecting observers:

- Independent PSOs shall be used (i.e., not construction personnel) and have no other assigned tasks during monitoring periods;
- At least one PSO must have prior experience performing the duties of a PSO during construction activity pursuant to a NMFS-issued incidental take authorization;
- Other PSOs may substitute education (degree in biological science or related field) or training for prior experience performing the duties of a PSO during construction activity pursuant to a NMFS-issued incidental take authorization; and
- PSOs must be approved by NMFS prior to beginning any activity subject to this IHA.

To be considered qualified to record observations of marine mammals for the proposed Project, observers must meet the following criteria:

- Visual acuity in both eyes (correction is permissible) sufficient for discernment of moving targets at the water’s surface, with ability to estimate target size and distance; use of binoculars may be necessary to identify marine mammals.
- Experience and ability to conduct field observations and collect data according to assigned protocols (this may include academic experience).
- Experience or training in the identification of marine mammal species and behaviors.
- Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations.
- Writing skills sufficient to prepare a report of marine mammal observations, including marine mammal species observed within the shutdown and behavioral disturbance zones.
- Ability to communicate orally, by radio, and in person with project personnel to provide real-time information on marine mammals observed in the area, as necessary.

All monitoring personnel will be provided a copy of this monitoring plan and the IHA. Monitoring personnel must read and understand the contents of this plan—as well as the IHA—as they relate to coordination, communication, and identification and reporting of incidental harassment of marine mammals.

### **4.3 PSO Responsibilities**

PSO tasks associated with monitoring and reporting requirements for each of the ongoing project activities are summarized below:

- Establish shutdown zone distances from pile to be extracted/installed.
- Monitor shutdown zone 30 minutes before pile driving is initiated to ensure marine mammals are not present.
- Monitoring will be continuous unless the contractor takes a break longer than 2 hours from active pile driving, in which case, monitoring will be required 30 minutes prior to restarting pile installation.
- If a marine mammal approaches or enters the shutdown zone during activities or pre-activity monitoring, all pile driving activities at that location shall be halted or delayed, respectively. If pile driving is halted or delayed due to the presence of a marine mammal,

the activity may not resume or commence until either the animal has voluntarily left and been visually confirmed beyond the shutdown zone or 15 minutes have passed without re-detection of the animal. Pile driving activities include the time to install or remove a single pile or series of piles, as long as the time elapsed between uses of the pile driving equipment is no more than thirty minutes.

- Monitor shutdown zone for a minimum of 30 minutes after pile driving stops.
- Monitor any marine mammal activity in the vicinity of the pile driving activity, including harbor seal use of the Castro Rocks haul-out.
- Observe marine mammal behavior and record observations, as described in Chapter 3.
- If a marine mammal is observed within the behavioral disturbance zone, record a Level B take and document behaviors.
- Coordinate with Chevron, construction contractor(s), and other monitors on site.
- Prepare Monitoring Data Sheet.
- Prepare post-construction report.

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## **Chapter 5 Reporting**

### **5.1 Reporting**

The following sections detail the NMFS reporting requirements pursuant to the IHA.

#### **5.1.1 Monitoring Data Sheets**

Monitoring Data Sheets that summarize the monitoring results, construction activities, and environmental conditions would be compiled and submitted with the post-construction monitoring report. The Monitoring Data Sheets would provide the following information:

- Date and location;
- PSO locations during marine mammal monitoring;
- Activity being monitored, including:
  - Pile type and size
  - Type of driving (e.g., vibratory or impact)
  - Attenuation device
  - Duration of or drive and time that pile driving begins and ends
  - Distances to thresholds;
- Count of all marine mammals observed by species, sex, and age class;
- Marine mammal location in the shutdown zone;
- Estimated amount of time that individual animals spent in the Level A or Level B zones
- Marine mammal reaction (if any) to activities, including head alerts, flushing, direction of movement, and type of activity that is occurring;
- Description of any observable marine mammal behavior patterns
- Other human activity in the area;
- Environmental conditions (e.g., tide, wind speed, wind direction, visibility, temperature) at the beginning and end of PSO shift, and whenever conditions change significantly; and
- Mitigation implemented.

### **5.1.2 Post-Construction Monitoring Report**

A draft report would be submitted to NMFS within 90 days after completion of the proposed Project (or annual pile driving work), in accordance with the requirements of the IHA. The draft report would include a description of the materials and methods used in monitoring, an overall summary of the project results, a discussion of the compliance record over the course of the entire program, and a discussion of the effectiveness of monitoring methods, and a total number and daily average (differentiated by month as appropriate) of individuals of each species detected within the Level A and Level B Zones.

A final report would be prepared and submitted to the services within 30 days following receipt of any comments on the draft report. Copies of the final report would be issued to pertinent regulatory agencies by Chevron.

The marine mammal monitoring report would provide useful information that would allow design of future projects to reduce incidental take of marine mammals. Chevron would share field data and behavioral observations on marine mammals that occur in the project area. This information could be made available to federal, state, and local resource agencies, scientists, and other interested parties upon written request.

### **5.1.3 Reporting Injured or Dead Marine Mammals**

In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner prohibited by the IHA (if issued), such as an injury, serious injury or mortality, Chevron would immediately cease the specified activities and report the incident to the Office of Protected Resources at [PR.ITP.MonitoringReports@noaa.gov](mailto:PR.ITP.MonitoringReports@noaa.gov), and the West Coast regional stranding network (866-767-6114). The report must include the information as described in the IHA.

In the event that an injured or dead animal is discovered, and the lead PSO determines that the cause is unknown and relatively recent, Chevron would immediately report the incident as described above. Activities would be able to continue while NMFS reviews the circumstances of the incident. In the event that Chevron discovers an injured or dead marine mammal and the lead PSO determines that the injury or death is not associated with or related to the activities authorized in the IHA, Chevron would provide a report, as described above, within 24 hours of the discovery. See the IHA for more detailed instruction.

## Chapter 6 References

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- National Marine Fisheries Service (NMFS). 2018. 2018 Revisions to: Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0): Underwater Thresholds for Onset of Permanent and Temporary Threshold Shifts. U.S. Dept. of Commer., NOAA. NOAA Technical Memorandum NMFS-OPR-59, 167 p.
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**Appendix A**  
**Daily Marine Mammal Monitoring Logs**

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Date: \_\_\_\_\_

Page \_\_\_ of \_\_\_

**Daily Marine Mammal Monitoring Summary Log**  
**Richmond Refinery Long Wharf Maintenance and Efficiency Project**

**Monitor(s):**

\_\_\_\_\_

**Weather/visibility observations and sea state, using Beaufort Scale on next page):**

\_\_\_\_\_

**Tidal Level (start work/end work):**

\_\_\_\_\_

**General Human Activity in the Area:**

\_\_\_\_\_

**Monitoring Location (s):**

\_\_\_\_\_

**Pile Type (s):**

\_\_\_\_\_

**Total Pile Count for the Day** \_\_\_\_\_ **Equipment:** Impact  Vibratory

**Total Minutes of Pile Driving/Total Blows of Impact Driving:**

\_\_\_\_\_

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Date: \_\_\_\_\_

Page \_\_\_ of \_\_\_

The Beaufort scale

<b>No.</b>	<b>Knots</b>	<b>Mph</b>	<b>Description</b>	<b>Effects at sea</b>	<b>Effects on land</b>
0	0	0	Calm	Sea like a mirror	Smoke rises vertically
1	1-3	1-3	Light air	Ripples but no foam crests	Smoke drifts in wind
2	4-6	4-7	Light breeze	Small wavelets	Leaves rustle; wind felt on face
3	7-10	8-12	Gentle breeze	Large wavelets; Crests not breaking	Small twigs in constant motion; Light flags extended
4	11-16	13-18	Moderate wind	Numerous whitecaps Waves 1-4ft high	Dust, leaves and loose paper raised. Small branches move.
5	17-21	19-24	Fresh wind	Many whitecaps, some spray; Waves 4-8 ft high	Small trees sway
6	22-27	25-31	Strong wind	Whitecaps everywhere; Larger waves 8-13 ft high	Large branches move; Difficult to use umbrellas
7	28-33	32-38	V. strong wind	White foam from waves is blown in streaks; waves 13-20ft high	Whole trees in motion
8	34-40	39-46	Gale	Edges of wave crests break into spindrift	Twigs break off trees; Difficult to walk
9	41-47	47-54	Severe gale	High waves; sea begins to roll Spray reduce visibility; 20ft waves	Chimney pots and slates removed
10	48-55	55-63	Storm	V. high waves 20-30 ft; blowing foam gives sea white appearance	Trees uprooted Structural damage
11	56-63	64-72	Severe storm	Exceptionally high waves; 30-45 ft high	Widespread damage
12	63	73	Hurricane	Air filled with foam; visibility reduced White sea; waves over 45ft high	Widespread damage; rare

## Daily Marine Mammal Monitoring Data Sheet - Richmond Refinery Long Wharf Maintenance and Efficiency Project

Time of Observation	Piling Activity <sup>1</sup>	Species <sup>2</sup>	Age Class <sup>3</sup>	Identifying Marks	Distance from Pile <sup>4</sup>	Direction of Travel	Behavior <sup>5</sup>
First: Last:							
First: Last:							
First: Last:							
First: Last:							
First: Last:							
First: Last:							
First: Last:							
First: Last:							
First: Last:							
First: Last:							
First: Last:							
First: Last:							
First: Last:							
<b><sup>1</sup>Activity:</b> Indicate if observation is: before (B); during (D); or after (A) pile driving.	<b><sup>2</sup>Species Abbreviations:</b> California Sea Lion = CASL Pacific Harbor Seal = HASE Northern Elephant Seal = NOES Harbor Porpoise = HAPO	<b><sup>3</sup>Species Age Classes:</b> CASL = juvenile, subadult male, adult male HASE = juvenile, adult HAPO = calf, adult	<b><sup>4</sup>Distance:</b> Provide an approximate distance from location of pile being driven, just driven, or about to be driven. Indicate unit of measurement (meters).	<b><sup>5</sup>Behavior examples:</b> Stationary at surface, swimming (slow or fast), transiting, foraging, resting, looking around. Note if mammal appears to be attentive to project activities, or displays any behavior changes related to project activities, and describe the project activity. Note any human-caused disturbances such as recreational boating or helicopters.  Add a reference number if comments are provided on a separate sheet.			

**Daily Marine Mammal Monitoring Data Sheet**  
**Richmond Refinery Long Wharf Maintenance and Efficiency Project**

**PHOTO LOG**

<b>Comment Reference Number</b>	<b>Photo Number</b>	<b>Photo Taken Before (B), During (D), or After (A) Pile Driving</b>	<b>Description</b>

**Daily Marine Mammal Monitoring Data Sheet**  
**Richmond Refinery Long Wharf Maintenance and Efficiency Project**

**Diagram**

**Biological Monitor:** \_\_\_\_\_ **Print Name** \_\_\_\_\_

**Signature:** \_\_\_\_\_