2021 Final Biological Monitoring and Mitigation Compliance Report

Chevron Long Wharf Maintenance and Efficiency Project

Chevron Products Company

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2021 Annual Biological Monitoring and Mitigation Compliance Report

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Acronyms and Abbreviations

BO	Biological Opinion
B2W	Berth 2 West
B2E	Berth 2 East
B4S	Berth 4 South
CASL	California sea lion
CDFW	California Department of Fish and Wildlife
dB	decibels
°F	degrees Fahrenheit
HAPO	Harbor porpoise
HASE	Pacific harbor seal
IHA	Incidental Harassment Authorization
ITP	Incidental Take Permit
m	meters
MMO	marine mammal observer
NMFS	National Marine Fisheries Service
Project	Chevron Long Wharf Maintenance and Efficiency Project
RMS	root mean square
SEL	sound exposure level

1. Introduction

This 2021 Final Biological Monitoring and Mitigation Compliance Report is being submitted to the California Department of Fish and Wildlife (CDFW) in accordance with Condition #6.8 in the Project Incidental Take Permit (ITP) No. 2081-2016-056-07, and to the National Marine Fisheries Service (NMFS) in accordance with the Project Biological Opinion (BO) issued April 4, 2017 (WCR-2015-1997) and Incidental Harassment Authorization (IHA) valid from June 1, 2021 through May 31, 2022.

The Chevron Long Wharf Maintenance and Efficiency Project (Project) includes multiple construction components within and above the water to bring the Long Wharf (Berths 1 through 4) into compliance with Marine Oil Terminal Engineering and Maintenance Standards and to improve the overall operational efficiency. Monitored Project construction activities (Covered Activities) for the 2021 monitoring year occurred between June 7 and November 16, 2021 at Berth 2 and Berth 4 (Table 1).

2. Project Area

The Project is located at the Chevron Products Company Richmond Refinery Long Wharf in the City of Richmond, Contra Costa County (Figure 1). The Project Area is approximately 0.75 mile south of the eastern side of the Richmond-San Rafael Bridge. Construction activities in 2021 occurred at both Berth 2 and Berth 4.

Sediments around the Long Wharf consist of a layer of recent Bay mud, approximately 5 to 12 meters in depth, overlying 9 to 18 meters of soft to medium stiff clay (Young Bay Mud), then older stiff clays to bedrock. Depth to bedrock in the area is generally 30 meters or more. The sediments are relatively uniform in the area surrounding the Wharf at locations where piles are being driven, so the description of the sediment stratigraphy would apply to all piles driven.

3. Methods

Marine mammal and fish monitoring efforts consisted of pre-Project baseline surveys, a worker education program, and visual monitoring during all work activities including impact and vibratory pile driving and extraction.

3.1 **Pre-Project Baseline Biological Survey**

3.1.1 Pre-Construction Nesting Bird Survey

A pre-construction nesting bird survey was conducted on June 7, 2021, in accordance with CDFW ITP No. 2081-2016-056-07, the NMFS BO, as well as a mitigation measure imposed in the Initial Study/ Mitigated Negative Declaration that was prepared by the California State Lands Commission for the Project to comply with the California Environmental Quality Act. There was a high level of bird activity on and around the Long Wharf, however, no active nests were observed during this survey. Incidental bird species observed during the baseline surveys included western gull, rock pigeon, common loon, and double-crested cormorant.

6/14/2021A total of two 24-inch-square concrete piles were installed with an impact hammer. The total driving time was approximately 20 minutes.6/15/2021A total of three 24-inch-square concrete piles were installed with an impact hammer. The total driving time was approximately 50 minutes.6/16/2021A total of our 24-inch-square concrete piles were installed with an impact hammer. The total driving time was approximately 50 minutes.10/13/2021A total of seven 14-inch steel H-piles were extracted with a vibratory pile driver. The total vibratory hammer operation was approximately 50 minutes.10/14/2021One 14-inch steel H-pile was extracted with a vibratory pile driver. The total vibratory hammer operation was approximately 31 minutes.10/14/2021A total of nine 14-inch steel H-piles were extracted with a vibratory hammer. The total vibratory hammer operation was approximately 31 minutes.10/21/2021A total of 10 14-inch steel H-piles were extracted with a vibratory hammer. The total vibratory hammer operation was approximately 21 minutes.10/22/2021A total of 10 14-inch steel H-piles were extracted with a vibratory hammer. The total vibratory hammer operation was approximately 21 minutes.10/26/2021A total of nine 14-inch steel H-piles were extracted with a vibratory hammer. The total vibratory hammer operation was approximately 21 minutes.10/27/2021A total of three 14-inch composite piles were installed. The piles were stabbed to proper depth without vibration.11/2021A total of two 14-inch composite piles were installed. The piles were stabbed to proper depth without vibration.11/2021A total of two 14-inch composite piles were installed. The piles were stabbed t	Date	Covered Activities					
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11/10/2021A total of eight 14-inch composite piles were installed. The piles were stabbed to proper depth without vibration.11/11/2021A total of three 14-inch composite piles were installed. The piles were stabbed to proper depth without vibration.11/15/2021A total of five 14-inch composite piles were installed. The piles were stabbed to proper depth without vibration.11/16/2021A total of six 14-inch composite piles were installed. The piles were stabbed to proper depth without vibration.	11/8/2021	A total of four 14-inch composite piles were installed. The piles were stabbed to proper depth without vibration.					
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11/15/2021 A total of five 14-inch composite piles were installed. The piles were stabbed to proper depth without vibration. 11/16/2021 A total of six 14-inch composite piles were installed. The piles were stabbed to proper depth without vibration.	11/11/2021	A total of three 14-inch composite piles were installed. The piles were stabbed to proper depth without vibration.					
11/16/2021 A total of six 14-inch composite piles were installed. The piles were stabbed to proper depth without vibration.	11/15/2021	A total of five 14-inch composite piles were installed. The piles were stabbed to proper depth without vibration.					
	11/16/2021	A total of six 14-inch composite piles were installed. The piles were stabbed to proper depth without vibration.					

Table 1 Summary of 2021 Monitored Covered Activities



FIGURE 1 Chevron Richmond Long Wharf Project Location

Chevron Chevron Long Wharf MAINTENANCE AND EFFICIENCY PROGRAM

3.1.2 Marine Mammal Baseline Observations

The use of pile driving hammers occurred first in June 2021 and then again in October 2021. A baseline marine mammal survey was initially conducted in June, before the start of in-water work. Because of the three month break in pile driving noise generating activities, a second marine mammal baseline survey was conducted prior to the start of in-water activities in October.

The first pre-Project baseline biological survey was conducted by two Project biologists on June 7, 2021, 7 days prior to the start of work at Berth 2 on June 14, 2021. The baseline survey was conducted in accordance with the IHA. The surveys consisted of a baseline marine mammal observation survey of the waters surrounding the Long Wharf, including but not limited to the Berth 2 area. This survey was conducted on foot from the Long Wharf, from 12:00 p.m. to 1:30 p.m. with a tide of 4.3 feet at 12:01 p.m. Weather conditions began with a slight haze at the start that transitioned to clear blue skies and a temperature of 64 degrees Fahrenheit (°F). The Beaufort scale report was between a 1 and 2 with a light breeze and small ripples on the surface of the water. The survey area had ships positioned at Berth 1, Berth 2 and Berth 3 which obstructed some of the view along the west side of the Long Wharf. Observers walked along the entire length of the Long Wharf. A distance of approximately 50 meters between each ship was not obstructed so that observers could see different angles around the width of the ships. Beyond the width of a ship (approximately 30 meters wide), the view of the water was not obstructed to the west. Views to Red Rock and Castro Ricks to the north were also not obstructed. Surrounding work activity at the neighboring berths and Long Wharf in general was minimal.

Two harbor seals (*Phoca vitulina*) were observed in the water near the Long Wharf during the baseline survey. The first individual was observed at 12:15 p.m. swimming at the surface east of Berth 2 before diving again at a distance of approximately 50 meters from the Wharf. A second individual was observed at 12:47 p.m. swimming at the surface for a few seconds before diving approximately 25 meters east of Berth 2. In addition to the harbor seals observed in the water, there were approximately 10 harbor seals hauled out at Castro Rocks, located approximately 700 meters north of the Project Area near the Richmond Bridge. No other marine mammals were observed during the survey.

The second baseline marine mammal survey was conducted by two Project biologists on October 8, 2021, 5 days prior to the start of work at Berth 4 on October 13, 2021. The survey area for marine mammals consisted of the waters surrounding the Long Wharf, including but not limited to the Berth 2 and 4 area. This survey was conducted on foot from the Long Wharf, from 10:20 a.m. to 01:15 p.m. with a baseline tide of 4.46 feet at 10:20 a.m. Weather conditions offered suitable visibility for marine mammal monitoring, involving low cloud cover at 0 to 5 percent, mostly sunny, clear skies and a temperature of 61°F. A mild breeze varied based on positioning along the Long Wharf, but the Beaufort scale report fell around 1 to 2 and never exceeded 4 during time of surveying. The survey area had ships positioned at Berth 1, Berth 2, and Berth 3 which obstructed some of the view along the west side of the Long Wharf. Observers walked along the entire length of the Long Wharf. A distance of approximately 50 meters between each ship was not obstructed so that observers could see different angles around the width of the ships. Beyond the width of a ship (approximately 30 meters wide), the view of the water was not obstructed to the west. Views to Red Rock and Castro Ricks to the north were also not obstructed. Surrounding work activity at the neighboring berths and Long Wharf in general was minimal.

Three harbor seals (*Phoca vitulina*) and one California sea lion (*Zalophus californianus*) were observed in the water near the Long Wharf during the baseline survey. At Berth 2, two harbor seal individuals were observed at 10:28 a.m. approximately 15 meters from the wharf and 11:03 a.m. approximately 30 meters from the wharf, respectively, each swimming at the surface east of Berth 2 before diving again. The California sea lion was observed at 10:20 a.m. at least 200 meters southwest of the wharf, hauled out and resting on an anchored metal buoy on the Bay Side. At Berth 4, a third harbor seal was observed at 12:41 p.m. approximately 135 meters south of the monitoring location and was observed swimming south before diving under wharf and remaining in general vicinity for about 30 minutes. During the second baseline survey, no pinnipeds were observed hauled out at Castro Rocks, approximately 700 meters north of the Project Area near the Richmond Bridge. No other marine mammals were observed during the survey.

3.2 Worker Education Program

In accordance with Permit conditions, an education program was given on June 2, 2021, before performing any work, to all persons employed or otherwise working in the Project Area. Due to COVID-19 shelter-in-place restrictions, materials prepared by the Designated Biologist describing the biology and general behavior of the Covered Species, the distribution and habitat needs of the Covered Species, sensitivity of the Covered Species to human activities, Covered Species legal protection, recovery efforts, and penalties for violations were provided to all site workers remotely. A brochure containing this information was provided to all site workers. All trained site workers signed a form stating they completed the training and understand all protection measures. The signature forms and training materials can be found in Appendices A and B.

3.3 Monitoring during Pile-Driving Activities

3.3.1 Marine Mammal Monitoring

Monitoring was conducted in accordance with the Project Marine Mammal Monitoring Plan.¹ Monitoring during each pile-driving event started at least 30 minutes prior to pile-driving (or removal) initiation and ended 30 minutes after such work was completed for the day, or when there was a pause in the work of 2 hours or more.

Two qualified, NMFS-approved marine mammal observers (MMOs)/fish monitors were on-site daily during in-water work, for a total of 20 days in 2021. Work took place at both Berth 2 and Berth 4, exclusively, for all covered work activities.

The MMOs were stationed at monitoring locations that afforded the best view of the Project Area and adjacent waters and adjusted these locations during barge positioning to ensure the most unobstructed views. Monitoring locations for work at Berth 2 always included one on the west side of the work area (referred to as Berth 2 West) and one on the east side of the work area (referred to as Berth 2 East) as noted on the figures below to view different angles and minimize any potential blind spots. Monitoring locations for work at Berth 4 always included one on the south side of the work area (referred to as Berth 4 always included one on the south side of the work area (referred to as Berth 4 South) and one on the north side of the work area (referred to as Berth 4 North) to view different angles and minimize any potential blind spots. Monitoring locations for work at Berth 4 always included one on the south side of the work area (referred to as Berth 4 South) and one on the north side of the work area (referred to as Berth 4 North) to view different angles and minimize any potential blind spots. The MMO stationed at the Berth 4 mooring dolphin catwalk had an unobstructed view of Castro Rocks and recorded daily observations of hauled out marine mammals. Cell phones were used to communicate among the MMOs, construction team, and hydroacoustic monitoring team. MMOs used binoculars to continuously scan the monitoring zone for marine mammals. Field data sheets summarizing environmental conditions, pile-driving activities, and observations of marine mammals were prepared daily by both MMOs (Appendix C).

Initial work at Berth 2 included impact driving a total of nine 24-inch-square concrete piles with associated shutdown zones of 10 meters for bottlenose dolphin, California sea lion and northern fur seal; 20 meters for Pacific harbor seal and northern elephant seal; 40 meters for harbor porpoise and gray whale; and 74 meters for all species in the Level B zone (Figure 2). Additionally, Steel H-piles were removed via vibratory extraction with a 10 meter shutdown zone for all species (Figure 3).

Work at Berth 4 began with an attempt to remove 36-inch steel pipe piles via vibratory extraction. However, the vibratory hammer was ineffective in loosening the piles and piles were cut at the mudline by divers instead. The shutdown zones for this work included 10 meters for bottlenose dolphin, California sea lion, northern fur seal, harbor seal, and northern elephant seal, and 20 meters for gray whale and harbor porpoise (Figure 4).

Lastly, although MMOs were present in November during installation of the 14-inch composite piles, these piles did not require vibratory driving. MMOs were on-site in case the work crew needed to use the vibratory hammer at any point (Figure 5). Because the vibratory hammer was never used, no monitoring

¹ AECOM (2021). Marine Mammal Monitoring Plan, Chevron Richmond Refinery Long Wharf Maintenance and Efficiency Project. June 2021. 45 pp.



Chevron Long Wharf Marine Mammal Monitoring

Berth 2 Shutdown Zones for Concrete Pile Driving



AECOM Chevron Chevron Long Wharf

Berth 2 Shutdown Zones -Vibratory Extraction of Steel H-Piles



AECOM Chevron

Chevron Long Wharf

Berth 4 Shutdown Zones for Vibratory Extraction of 36-Inch Steel Piles



AECOM Chevron Chevron Long Wharf **FIGURE** 5 Berth 4 Shutdown Zones for Installation of 14-inch Composite Piles (note: vibratory hammer was ultimately not needed for these piles)

3.3.2 Monitoring for Listed Fish Species

Monitoring was conducted for the following three Covered Species subject to take authorization: Sacramento River winter-run chinook salmon (*Oncorhynchus tshawytscha*), Central Valley spring-run chinook salmon (*Oncorhynchus tshawytscha*), and longfin smelt (*Spirinchus thaleichthys*). Monitoring consist of visual observations during pile driving activities to note any distressed or injured fish. Listed fish species covered under the CDFW ITP observed during the 2021 monitoring activities are discussed in Section 4.3.

3.4 Hydroacoustic Monitoring

The majority of pile types to be installed or removed were monitored in prior years of the Project. The 2021 Hydroacoustic Monitoring Plan called for conducting hydroacoustic measurements on two of the 14-inch composite barrier piles that were to be driven with a vibratory hammer and for the removal of two timber piles via vibratory extraction.

During installation of the composite barrier pules, the piles sunk to the appropriate depths without the need for vibratory driving. These piles were not load bearing and since the piles sunk to appropriate depths, they did not need to be driven to be seated. The contractor chose to use a direct-pull method for the timber pile extractions and no vibratory hammer was used as was originally planned.

Because no vibratory hammering was conducted for either of these piles types, no planned hydroacoustic monitoring was conducted.

4. Monitoring Results

4.1 Hydroacoustic Monitoring

As described in Section 3, no hydroacoustic monitoring was conducted in 2021 because the piles that were to be monitored ultimately did not require installation or extraction with a pile driving hammer.

4.2 Marine Mammal Monitoring

4.2.1 Monitoring Conditions and Monitored Activities

Conditions during observation periods were variable but generally favorable for marine mammal observations. There were a few days in November that MMOs encountered fog, wind and precipitation conditions, however, pile driving or use of the vibratory hammer did not take place and monitoring relative to shutdown or Level B zones was not necessary. Overall, MMOs were reliably able to observe the waters within 450 meters of all active pile driving activities. For a summary of daily work activities, see Table 1.

In June 2021, nine 24-inch concrete piles were driven with an impact hammer west of Berth 2 (Figure 2). A bubble curtain attenuation system was in operation during all impact pile driving.

In October 2021, 36 14-inch steel H-piles (Berth 2 temporary fender piles) were extracted with a vibratory hammer. Additionally, eight temporary 36-inch steel pipe piles that were driven last year were attempted to be removed using a vibratory hammer, however, this method proved to be ineffective in loosening the piles. The tops of piles became damaged when the holes drilled through the steel to secure rigging to pull and lift the piles tore through. Because the use of the vibratory hammer on the 36-inch piles was unsuccessful in sufficiently loosening the attempted piles, all eight piles were instead cut below the mudline. Further, a total of 11 14-inch composite piles were installed as barriers to protect the Berth 4 Seismic Retrofit. These piles sunk to the appropriate depth under their own weight, plus the weight of the vibratory hammer, which was never activated.

In November, 2021 the remaining 41 14-inch composite piles at Berth 4 also sunk to appropriate depths without the need for the active driving, thus no vibratory hammering took place in November.

Movement and repositioning of barges throughout Project activities would sometimes partially and temporarily obstruct small portions of the Project Area. MMOs moved along the Berth 4 dolphin walkways, staircases, and used elevated platforms to optimize views. MMOs also used cell phones to communicate blind spots and to confirm that at least one MMO could see around obstructions. Continuous communication and movement around Berth 2 and 4 ensured that MMOs observations could continue reliably.

4.2.2 Marine Mammal Observations and Take

<u>Marine Mammal Observations</u> – The marine mammal Monitoring Period during construction activities was defined as 30 minutes prior to pile-driving (or removal) initiation and ended 30 minutes after such work was completed for the day, or when there was a pause in the work of 2 hours or more. After October 26, 2021, pile driving did not take place, therefore, MMOs were on standby in case there was a need to use the vibratory hammer but no specific monitoring relative to shut-down or Level B distances was conducted. Data sheets with routine observations are included in Appendix C for completeness, but were not used in calculations of take.

Harbor seals (*Phoca vitulina*) and California sea lions (*Zalophus californianus*) were the only marine mammal species commonly observed during the construction season, with a few harbor porpoise (*Phocoena phocoena*) observations along the west side of the wharf on a few occasions.

Across all monitoring dates, most of the harbor seals observed at Berth 2 and 4 were observed on the mainland side of the wharf (east side), approximately 40 to 300 meters from the Long Wharf. Seals were rarely seen on the open Bay side, west of the Wharf surrounding the crane and materials barges. In contrast, most sea lion sightings occurred on the Bay side of the wharf, west of the Long Wharf and typically less than 100 meters from the construction activities and monitoring locations. Based on documented behavior and direction of travel, sea lions generally appeared to move through the Project Area at a faster travel speed than harbor seals. Harbor seals were the only species of marine mammal observed hauled out at Castro Rocks.

Harbor porpoises were observed swimming past the Bay side of the Long Wharf on four monitoring dates between October and November 2021. On each of these dates, the observations were made outside of construction activities and the Monitoring Period associated with pile driving and/or extraction. On October 26, 2021, two adults were observed porpoising and traveling northwest about 200 meters from the barge and away from the work area. On November 3, 2021, three individual porpoises were observed milling and circling about 200 meters west of the barge at separate sighting times. On November 4, 2021, a pair surfaced a total of six times during the day as they traveled east in the direction of San Francisco and Oakland. On November 8, 2021, two individuals were documented milling about 100 meters together on the Bay side and slowly meandering northwest.

No other species of marine mammals were observed during the construction season.

Behavioral Changes Observed in Swimming Marine Mammals – Table 2 lists the instances when harbor seals and sea lions were observed in the water surrounding the Project Area and how they reacted to active vibratory or impact pile driving/extraction in the work area around Berth 2 and 4.

Behavioral Changes Observed in Marine Mammals at Castro Rocks – Table 3 summarizes instances when harbor seals that were observed hauled-out at Castro Rocks, reacted to active vibratory pile driving. No behavioral changes were observed at Castro Rocks during impact pile driving. All Castro Rock observations were recorded by the MMO positioned at BERTH 2 EAST and one monitoring date at BERTH 4 NORTH. The haul out is located approximately 700 meters north of the Project Area.

Date/Time	Species	MMO Position	Distance from Pile (meters)	Bearing from MMO	Behavior	
6/14/21	HASE	B2E	50 m	32	Surfaced, looked around for 30 seconds and dove.	
6/16/21	HASE	B2E	80 m		Stationary at surface, looked around, then dove.	
10/18/21	HASE	B4S	50 m	15	Floated at surface facing west before diving, resurfaced and swam with another HASE individual observed earlier in the monitoring day.	
10/18/21	HASE	B4S	500 to 700 m	0	Swam toward the west.	
10/18/21	HASE	B4S	10 to 50 m (issued stop work due to proximity at 10 m)	320	Floated at surface toward the piles immediately adjacent to barge, swa toward the piles and dove down.	
10/18/21	HASE	B4S	40 m	30	Swam in the direction of the piles/ barge before diving.	
10/21/21	CASL	B2W	45 m	294	Emerged from the water and swam seemingly curious about ongoing work, then quickly left.	
10/21/21	HASE	B2E	120 m		Emerged from the water and inspected surroundings before diving.	
10/21/21	HASE	B2E	180 m	_	Emerged from the water with a fish in its mouth and swam in circles trying to eat it.	
10/25/21	HASE	B2E	120 m	_	Periscoped at the surface for 30 seconds, then dove.	

Table 2 In-Water Marine Mammal Behavioral Changes During Active Pile Driving

Notes:

B2E = Berth 2 East B2W = Berth 2 West B4S = Berth 4 South CASL = California sea lion HASE = Pacific harbor seal m = meters MMO = marine mammal observer

Table 3 Castro Rocks Marine Mammal Behavioral Changes During Active Pile Driving

Date	Behavior
10/26/2021	One individual jumped off Castro Rocks and began transiting 1 minute after active vibratory pile driving finished.

Estimated Take – Each individual animal observed within the estimated B zones (as reported in the IHA) during active driving was treated as a take event. Multiple sightings of an individual animal were recorded as one observation, provided the animal could be tracked or otherwise individually identified. Table 4 provides a summary of the estimated distances of Level B threshold exceedance, as presented in the IHA.

Table 4	Predicted Underwater Pile Driving Noise Levels and Distances of Threshold
	Exceedance

	Sourc 10 m	e Levels at eters (dB)	Distance to Threshold 160/120 dB RMS (Level B)* meters	
Pile Type	Peak	RMS/SEL		
Impact Driving				
24-inch-square concrete	191	161	74	
Vibratory Driving/Extraction				
14-inch Composite Barrier Pile	178	168	15,849	
36-inch steel pipe pile extraction	196	167**	3,358	
14-inch steel H-pile extraction	165	150	316	
Timber pile extraction	No Data	152	1,359	

Notes:

* 160 dB RMS applied to impulse noise such as impact driving and 120 dB RMS applies for continuous noise such as vibratory driving.
 ** Source value as reported at 15 meters

dB = decibels

RMS = root mean square

SEL = sound exposure level

For all pile driving, Level B takes were recorded for animals observed only during active pile driving. A summary of take recorded by the MMOs during the Monitoring Period is provided in Table 5. There were no indicators of marine mammal injuries observed during the Monitoring Period. A total of 11 instances of Level B harassment for harbor seal, and one instance of Level B harassment for California sea lion were recorded in the observable portion of the Level B zone.

Table 5Observed Level B Takes

Date	Species	Total Observed During Monitoring Period	Level B Takes Observed During Active Pile Driving	Distance During Active Driving (meters)	Pile Type and Amount Installed During Monitoring Period	Hammer Type
6/14/21	HASE	3	1	50	Two 24-inch-square concrete piles	Impact
6/16/21	HASE	4	1	80	Four 24-inch-square Ir concrete piles	
10/18/21	HASE	8	3	10-700	Two 36-inch steel pipe piles	Vibratory
10/21/21	CASL	1	1	45	Nine 14-inch steel H-piles were extracted	Vibratory
10/21/21	HASE	4	2	120-180	Nine 14-inch steel H-piles were extracted	Vibratory
10/25/21	HASE	2	1	120	Ten 14-inch steel H-piles were extracted	Vibratory
10/26/21	HASE	11	1	700 (at Castro Rocks Haul-out)	Nine 14-inch steel H-piles were extracted	Vibratory
Total Leve HASE: 11 CASL: 1	el B Takes					

Notes:

• The count presented in the "Total Observed During Monitoring Period" column is inclusive of the animals observed during active pile driving.

* Days that piles were installed without the use of impact and vibratory hammer equipment are not included within this table since no takes occurred and therefore is not applicable. See Table 1 for a list of all monitoring dates and activities that took place.

CASL = California sea lion

HASE = Harbor seal

As required by the IHA, potential takes of marine mammals that occurred outside of the reliably observable portion of the Level B zone (a radius of 450 meters) were extrapolated. This was done by taking the daily observed take (animals sighted within the observable Level B zone during active pile driving) multiplied by the unobservable portion of the Level B zone. The daily observed take density was developed by summing the total number of takes observed on each day divided by the observable area of the Level B zone.

October 18, 2021 was the only day of activity where take needed to be extrapolated since the entire Level B zone was reliably observed for installation of the 24-inch-square concrete piles and removal of the 14-inch steel H-piles. Other 2021 work activities that would have required extrapolation included vibratory extraction of timber piles and vibratory driving of the composite barrier piles. However, as noted in previous sections, these activities did not ultimately require the use of pile driving hammers, so no take occurred.

On October 18, 2021, during extraction of 36-inch steel piles, the observed daily take density for harbor seals is as follows:

(3 harbor seal takes observed / $(\pi \times 0.4 \text{ km}^2)) = 2.39$ harbor seal/km² takes.

To extrapolate daily take, the observed daily take density was multiplied by the area of the unobservable portion of the predicted Level B zone for that pile driving activity. This value is 25.27 square kilometers for vibratory extraction of the 36-inch steel shell piles, as calculated from the distance of threshold exceedance predicted for the 2019 IHA (Table 4). The extrapolated daily take for October 18, 2021, is therefore:

2.39 harbor seal/km² takes x 25.27 square kilometers = 60.4 extrapolated takes.

The entirety of the Level B zone was observable for all other pile extraction activities that happened in 2021, or as mentioned, impact or vibratory hammers were not used as initially planned and therefore no takes occurred and no monitoring relative to Level B exceedance zones was necessary.

Note that land areas and the observable area of water are excluded from the area of the unobservable Level B zone. Table 6 provides a summary of the observed and extrapolated takes for 2021. Extrapolation was only needed for species where take was observed during active pile extraction of the 36-inch steel shell piles. In this case, harbor seal was the only species that required extrapolation. Take was not observed for any other species of marine mammals on October 18, so take extrapolation is only applied for harbor seal.

Table 6 Summary of 2021 Level B Take Events

Species	Level B – 2021 Authorized Take	Level B – Recorded	Level B -Extrapolated
НАРО	327	0	NA
Total HAPO Takes 2021		0 Le	vel B
CASL	12	1 (Vibratory Driving) 0 (Impact driving)	NA
Total CASL Takes 2021		1 Le	vel B
HASE	8,532	9 (Vibratory Driving) 2 (Impact driving)	61 (Vibratory Driving) 0 (Impact driving)
Total HASE Takes 2021		72 Le	evel B

Notes:

CASL = California sea lion HAPO = Harbor porpoise HASE = Pacific harbor seal NA = not applicable

4.2.3 Pile-Driving Shutdowns

On one occasion, Project work was temporarily delayed for purposes of take avoidance. On October 18, 2021 during the initial 30 minute monitoring time, the MMOs notified Chevron at 1:29 p.m. that a harbor seal was seen inside the 10-meter shutdown zone, prior to the initiation of pile-extraction activities. At this time, the vibratory hammer was still being positioned for work and was not yet in use. Crew members did not use the vibratory hammer while the harbor seal was inside the shutdown zone. The seal was observed again outside of the shutdown zone, 6 minutes after the initial sighting. MMOs notified Chevron at 1:35 p.m. that pile extraction could begin.

4.3 Listed Fish Observations and Take

During Covered Activities, monitoring for fish was conducted for the following three Covered Species subject to take authorization: Sacramento River winter-run chinook salmon (*Oncorhynchus tshawytscha*), Central Valley spring-run chinook salmon (*Oncorhynchus tshawytscha*), and longfin smelt (*Spirinchus thaleichthys*). During construction activities on June 14, 15 and 16, 2021, no Covered Species of fishes covered under the CDFW ITP were observed. On October 14, 2021, a California sea lion was observed eating a large silvery fish that may have been a salmonid, but due to the distance from the observers, the fish could not be reliably identified. This predation event was also observed before any pile driving had occurred for the day, and there is nothing to indicate that the predation event was influenced by construction activities at the Long Wharf. During construction activities from October 13 through November 16, 2021 no other Covered Species of fishes covered under the CDFW ITP were observed during the 2021 construction season.

5. Discussion

As presented in the IHA application, harbor seals are the most likely species to occur in the vicinity of the Long Wharf and were the most common species observed during all pile driving and work activities in 2021. No Level A take of marine mammal species occurred. Level B take of marine mammal species (including extrapolated take) were within the limits of the 2021-2022 IHA issued by NMFS.

No incapacitated or injured fish were observed within the monitoring area during any Covered Activities. Hydroacoustic monitoring conducted in prior years found that the distances over which underwater noise levels were exceeded were consistently lower than the modeled results for fish presented in the Biological Assessment provided to NMFS and in accordance with the ITP.

The current avoidance and minimization measures, as required in permit conditions, have been demonstrated to effectively minimize take of marine mammals and fish.

Appendix A Worker Environmental Awareness Training Program

Biological Resources



Biological resources training is required for all persons working in the Project Area before performing work.



Regulatory Requirements



- Federal Endangered Species Act (ESA)
 - Prohibits the "take" of any listed species. "Take" is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."
- California Endangered Species Act (CESA)
- Marine Mammal Protection Act protects all marine mammals.
 - Prohibits the "take" (injury or harassment) of marine mammals unless under incidental harassment permit.
 - Illegal to intentionally harass marine mammals
- California Fish and Game Code §3511 prohibits take of fully protected birds.

Violation of federal and/or state environmental laws may result in fines and/or jail.

Biological Issues and Protected Species



- Acoustic Sensitivity
 - Marine mammals and fish are sensitive to underwater sounds
 - Pile driving
 - Vibratory hammer (continuous noise)
 - Impact hammer (impulse noise, high peaks)
 - Sound produced during work can
 - Confuse and disorient animals
 - Cause physical harm damage to fish tissues and hearing loss in mammals
 - Discourage natural behaviors like feeding and resting
 - Work window between June 1 and November 30 when fewer species are present

Covered Species: Fish



Chinook salmon

Longfin smelt









Covered Species: Marine Mammals - Pinnipeds



- Pacific harbor seal and California sea lion
 - Sensitive to underwater noise
 - Exclusions zones will be monitored before and during driving



Covered Species: Marine Mammals - Cetaceans



- Harbor porpoise and gray whale
 - Very sensitive to underwater noise
 - Larger exclusion zones than seals and sea lions
 - Less likely to be seen in the vicinity of the Long Wharf



Harbor Porpoise



Gray Whale

Exclusion Zones



SENSITIVE SPECIES

NESTING AND PROTECTED BIRDS

Most nesting birds are protected under the Migratory Bird Treaty Act except rock dove, European starling and house sparrows. If you see a nest, contact a biologist.

MARINE MAMMALS

 All marine mammals are protected under the Marine Mammal Protection Act.

Pacific Harbor Seal



- Most common marine mammal species in the Project area.
- Has spotted coat in a variety of shades from white or silver-gray to dark brown or black. They are true seals, having no external ear flaps. Has small flippers and move on land by flopping along on their bellies.



 Second most common marine mammal species in the Project area. Color ranges from chocolate brown in males to a lighter golden brown in females. Known for noisy barking. They are not "true" seals, having external ear flaps and large flippers that they use to "walk" on land.



 Small, relative to most dolphins. Backs are very dark gray or dark brown. They have a low triangular dorsal fin located slightly after the center of the body.



Can grow to about 50 feet long, with mottled gray body, small eyes above the corners of the mouth, and broad, paddle-shaped, pointed pectoral fins (flippers). Has a dorsal hump instead of a fin, and a series of small bumps between the hump and tail flukes.

Marin	e Mamn	nal Exclusion	Zones to	be Enford	ed.				
	Shutdown Distance from Pile (meters)								
Project Element Requiring Pile Installation	Gray whale	Bottlenose dolphin	Harbor	Harbor seal, Northern elephant seal	California sen lion, Northern fur seal				
Impact Drivin	g (with l	bubble curta	in)						
24-inch square concrete	20	10	50	15	10				
Impact Pile Pi	roofing (no bubble cu	irtain)	_					
36-inch steel pipe pile	60	10	80	30	10				
Vibratory Dri	ving/Ext	raction							
36-inch steel pipe pile	15	10	50	15	10				
20-inch steel pipe pile	10	10	50	10	10				
Wood and concrete pile extraction	10	10	50	15	10				

FISH



General Protective Measures



- Time Restrictions: For pile driving activities, Chevron shall operate only during daylight hours; conduct pile installation, removal, and related in-water work between June 1 and November 30
- Permittee shall use a bubble curtain during all pile installation of 60" diameter piles using an impact hammer.
- Permittee shall install piles with a vibratory pile driver to the maximum extent feasible. Maximum pile diameter to be installed shall be 60 inches.
- Sound pressure levels should not exceed any of the calculated distances to the peak pressure or accumulated sound exposure level.
- All piles shall be removed by direct pull or by vibratory methods. Should a pile break or cannot be removed, the pile shall be cut off, at a minimum, 2 feet below the mudline.

Measures to Protect Marine Mammals

Chevron

Use of Ramp Up/ Soft Start:

- <u>Diesel hammer</u>: Initial strike then 30 second waiting period. Repeat 2 additional times.
- Vibratory hammer: turn on for 15 seconds then wait for 30 seconds. Repeat 2 additional times.
- Establishment of Shutdown Zones: For all pile driving activities, NMFS will specify shutdown zones for marine mammals. Monitors will observe zones for 30 min prior to the start of driving and will give the all-clear to start. If animals approach too close a temporary shutdown of driving may be needed.
- Pile caps or cushions shall be used during all impact pile-driving activities.
- For in-water heavy machinery work other than pile driving (*e.g.*, standard barges, tug boats, barge-mounted excavators, or clamshell equipment), if a marine mammal comes within 10 meters, operations shall cease and vessels shall reduce speed to the minimum level required to maintain steerage and safe working conditions.
- Visual marine mammal monitoring, observation, data collection, and reporting.
- 2020 monitoring effort: abundant harbor seal observations nearby.

Nesting Birds



- Refinery has implemented a Bird Conservation Plan (BOP)
- Addresses conflicts with birds
- Nesting bird survey is required prior to the start of the nesting season April 1 – August 31
- Workers should be observant of possible nests throughout the year and during all construction activities
- Nests must be removed by a qualified biologist

Western gull



California least tern (Endangered)

Brown pelican (CFGC Fully Protected)





Double-crested cormorant

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Responsibilities



- All workers should always keep an eye open for these species.
- If dead or injured fish or marine mammals are observed, immediately notify the Project Compliance Specialist
- If a bird nest is observed, notify the Project Compliance Specialist
- Remember: it is illegal to intentionally harm or harass marine mammals



Questions?



Environmental Contact	Phone number
Mandi McElroy (Designated Biologist)	706-254-8717
Bill Martin (Compliance Specialist)	925-640-4806
Maureen Dunn (Refinery HES Water Specialist)	510-242-6912 (work) 510-210-2483 (cell)

Appendix B Training Attendance Record

Refinery Long Wharf Maintenance & Efficiency Project Education and Training Meeting Attendee Sign-In Sheet Date: 622021

The person completing and signing this Sign-in Sheet acknowledges that they have attend and successfully completed the required training session and understand all protection measures imposed by the LWMEP regulatory conditions of approval and mitigation measures required by the ITP issued by CDFW.

Name	Company	Phone	Email
Rue BROOKS	EICHLEAY (CHEVRON CONSTR	UCTION REP)	
Maghing	POWER ENGINEE CONSTRUCTION	Co.	
Pessee Condout	PEC		
Altono Ramirez	PEC		
ALBERT APORACA	PEC		
Camilo Ortiz	PEC		
Eloy Vake M	PEC		
DaveTronport	PEC		
Joe Apodaca	PEC		
Jostuz Polone	PEC		
Diego Rodrigues	PEC		
EVON HATUDING	PEC		
Sharen Shares	PEC		

Roberto Aljander PEC Rafael Otero PEC Rubert Teremin PEC é. PEC VILSNIE CORRAL Too Jus Corous PEC SPENCER HOLMOLIST PEC Richard Foster PEC Stephen Proctor PEC Rays Young PEC Adam/autent PEC Ogt Kleme PEC Almater PEC JANEN SOAMES PEC Jason Pleasants PEC laver forguer PEC Ton Elis PEC Bennett Cless PEC InDet PEC Grott Dilliams PEC

Appendix C Marine Mammal Monitoring Daily Field Datasheets

Under Separate Cover