Request for an
INCIDENTAL HARRASSMENT AUTHORIZATION
Under the Marine Mammal Protection Act

Front Street Marine Transload Facility

Newport, Oregon
Yaquina Bay (6th Field HUC #171002040303)
(T11S, R11W, S8)

Harbor Seal (*Phoca vitulina*)

California Sea Lion (*Zalophus californianus*)

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PHS Project Number: 5605

TABLE OF CONTENTS

Page

1.0 DESCRIPTION OF THE ACTIVITY 1
1.1 Introduction 1
1.2 Project Purpose and Need 1
1.3 Project Description 3
1.3.1 Removal of the Existing Undersea Gardens 3
1.3.2 Construction of the New Transload Facility 4
1.3.3 Proposed Mitigation 5
1.4 Estimated Zone of Influence 7
1.4.1 Estimated Zone of Influence for Level B Harassment 7
1.4.2 Estimated Safety Zone for Level A Injury 8

2.0 DATES, DURATION, AND LOCATION OF ACTIVTY 8
2.1 Dates… 8
2.2 Duration 8
2.3 Project Location 11

3.0 MARINE MAMMAL SPECIES AND NUMBERS 11
3.1 Harbor Seal 11
3.2 California Sea Lion 12
3.3 Steller Sea Lion 12
3.4 Killer Whale 13

4.0 STATUS AND DISTRIBUTION OF AFFECTED SPECIES 14

5.0 TYPE OF INCIDENTAL TAKE AUTHORIZATION REQUESTED 14

6.0 NUMBER OF MARINE MAMMALS THAT MAY BE AFFECTED 14
6.1 Harbor Seal 15
6.2 Steller Sea Lion 16

7.0 ANTICIPATED IMPACTS ON MARINE MAMMAL SPECIES 17
7.1 Anticipated Impacts on Oregon/Washington Coast Harbor Seal Stock 17
7.2 Anticipated Impacts on U.S. California Sea Lion Stock 17

8.0 ANTICIPATED IMPACTS ON SUBSISTENCE USE 18

9.0 ANTICIPATED IMPACTS ON MARINE MAMMAL HABITAT 18

10.0 ANTICIPATED IMPACTS OF LOSS OR MODIFICATION OF HABITAT 18

11.0 MITIGATION MEASURES 18

12.0 ARTIC SUBSISTENCE PLAN OF COOPERATION 21

TABLE OF CONTENTS

Page

13.0 MONITORING AND REPORTING 21

13.1 Monitoring to Estimate Take 21
13.2 Minimum Qualifications of Marine Mammal Observers 21
13.3 Monitoring Report 22

14.0 SUGGESTED MEANS OF COORDINATION 22

15.0 REFERENCES 24

FIGURES

Figure 1 Project Location 2
Figure 2 Proposed Offsite Mitigation at River Bend Marine 6
Figure 3A Zone of Influence 9
Figure 3B Safety Zone 10

APPENDICES

APPENDIX A: Project Plan Sheets
APPENDIX B: Project Photographs
APPENDIX C: Pile Driving Data

1.0 DESCRIPTION OF THE ACTIVITY

1.1 Introduction

The proposed Front Street Marine Transload Facility (the project) will require piling installation within U.S. marine waters known to support marine mammal species protected under the Marine Mammal Protection Act (MMPA). The MMPA is administered by the National Marine Fisheries Service (NMFS) and prohibits the taking of marine mammals, which is defined as to "harass, hunt, capture or kill, or attempt to harass, hunt, capture or kill," except for specified activities, including piling installation. Specifically, Section 101 (a)(5)(D) of the MMPA allows, upon request, for the taking of marine mammals incidental to conducting such specified activities, provided the activity results in negligible impacts to marine mammals and does not adversely affect their habitats or subsistence use.

The timing and duration of piling installation activities associated with the proposed project may result in the incidental take of marine mammals due to acoustic harassment (i.e., Level B take). As such, this Incidental Harassment Authorization (IHA) request was prepared pursuant to Section 101 (a)(5)(D) of the MMPA by Pacific Habitat Services, Inc. (PHS) for NMFS on behalf of Bergerson Construction, Inc. (Bergerson), to facilitate compliance with the MMPA. This IHA is being requested for two species of marine mammals (harbor seal and California sea lion) that will likely occur within the vicinity of the proposed project action area.

1.2 Project Purpose and Need

The purpose of the proposed project is to construct a new transload and fish buying facility at the current location of the Undersea Gardens (a local tourist attraction) located in Yaquina Bay along Bay Boulevard in Newport, Oregon (see Figure 1). The new transload facility will provide local fisherman with an alternative location for selling their fish and shellfish in Newport. The proposed facility will be constructed on property that is owned by Front Street Marine, and currently leased to the Undersea Gardens. The Undersea Gardens and all associated structures will be removed prior to construction of the new facility.

The proposed project location and design was evaluated to determine if it was feasible from an engineering, environmental, and economic standpoint, and that it was consistent with the underlying project purpose to provide local fisherman with an alternative location for selling seafood in Newport. It was first determined that the facility must be located on the Newport waterfront in order to be economically viable. The applicant initially looked at two potential locations, including the current proposed location, and another existing deteriorated dock, located approximately 1,500 feet downstream of this proposed facility. The owner of the existing dock was unwilling to sell. The current proposed location provides for unobstructed boat access and is located adjacent to another existing fish buying facility.

During project design, the project team considered ways to minimize in-water impacts by avoiding in-water excavation and/or dredging, limiting in-water work to the ODFW-preferred in-water work window (IWWW) for the Yaquina River estuary (November 1 – February 15), using a vibratory hammer for piling removal and the majority of piling installation, and by removing approximately 2,500 cubic yards of existing structural components from below the highest measured tide (HMT) of Yaquina Bay.

5605
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Project Location
Front Street Marine Transload Facility Project
Newport, OR (Google Earth 2015)

FIGURE
1

1.3 Project Description

As stated above, the proposed project will construct a new transload and fish buying facility at the current location of the Undersea Gardens in Yaquina Bay. The Undersea Gardens and all associated structures will be removed prior to construction of the new facility. The new transload facility will consist of a 132-foot wide by 141-foot deep wharf comprised of precast concrete panels supported on steel piles (see Appendix A: Project Plan Sheets). Up to 112 24-inch diameter steel support piles and 14 18-inch diameter steel fender piles will be installed. The new wharf will sit level with Bay Boulevard, approximately 10 feet above mean sea level (msl), and will support a 4,000 square foot cold storage building and 500 square foot ice machine (see Appendix B). Approximately 15,860 square feet of the new wharf will be suspended over water, resulting in approximately 9,160 square feet of *net new* overwater structure following removal of the existing Undersea Gardens and its associated structures (approximately 6,700 square feet). The proposed project will result in a *net removal* of approximately 2,000 cubic yards of existing structural components from below the HMT of Yaquina Bay.

Construction is scheduled to begin in November 2015, with completion of the wharf expected by September 2016. The associated cold storage building will be constructed after completion of the wharf. The proposed project will require approximately 12 weeks of in-water work. All work conducted below the HMT of Yaquina Bay will occur between November 1 and February 15 of the ODFW-preferred IWWW for the Yaquina River estuary (ODFW 2008). Construction crews and equipment will access the project site via existing roadways and two floating barges, including a crane barge (measuring 60 by 100 feet) secured with two spud piles, and a material barge (measuring 40 by 100 feet) moored to the crane barge. Piles will be installed using a vibratory hammer with some use of an impact hammer to seat the piles to their desired depth. The following is a general sequence of proposed project activities, further detailed discussion is provided in the sections below:

1. Conduct overall project mobilization and implement environmental controls.
2. Remove existing wooden breakwater and pier along south side of Undersea Gardens.
3. Remove Undersea Gardens (floating structure) and associated storage dock and access ramp.
4. Install up to 112 24-inch diameter steel support piles (10-foot on center), and 14 18-inch diameter steel fender piles.
5. Install precast concrete wharf panels.
6. Construct cold storage building and install ice machine and utilities.

1.3.1 Removal of the Existing Undersea Gardens

The existing Undersea Gardens and all associated structures (including a wooden breakwater, small storage dock, access ramp, small section of pier, and approximately 25 pilings) must be removed prior to construction of the new transload facility. The Undersea Gardens is a floating structure that houses an underwater aquarium and gift shop (see Appendix B: Project Photographs). The structure itself will be towed from its current location (via tugboat) approximately 10 miles upstream to Yaquina Boatyard, where it will then be dismantled. In order to access the Undersea Gardens with a tugboat, the existing wooden breakwater that protects the structure will have to be removed. The breakwater is comprised of vertical wooden boards

assembled in a line and supported by steel and wood piles. The boards will be removed by hand and the remaining support piles (including approximately five H-piles, five 12-inch diameter steel piles, and five 12-inch diameter wooden piles) will be removed with a vibratory hammer. Following removal of the breakwater, approximately eight 12-inch diameter wooden support piles and a small section of pier, and two 12-inch diameter spud piles that anchor the storage dock will also be removed.

It is anticipated that piling removal will require approximately 15 minutes of vibratory hammer use per pile. All items removed will be placed in a contained area on a service barge and hauled to an upland location for recycling or disposal. Removal of the existing piles will require approximately 6 hours of total vibratory hammer use over a period of two to four in-water work days. Removal of the existing Undersea Gardens and associated structures will result in the removal of approximately 2,500 cubic yards of existing *in-water* structures from below the HMT of Yaquina Bay, and 6,700 square feet of existing *overwater* structures. No dredging or in-water excavation will be required.

1.3.2 Construction of the New Transload Facility

Wharf

As discussed above, the new transload facility will consist of a 132-foot wide by 141-foot deep wharf comprised of precast concrete panels supported on up to 112 24-inch diameter steel support piles, and 14 18-inch diameter steel fender piles (see Appendix A). The precast panels will be approximately 4 feet wide by 20 feet long, requiring seven panels supported on eight rows of piles spaced 10-foot on center across each row. The bottom of each panel will be painted with white, light reflecting paint to increase natural lighting under the new wharf. The new wharf will sit level with Bay Boulevard, approximately 10 feet above msl, and will result in approximately 9,360 square feet of *net new* overwater structure.

Piling Installation

The steel support piles and fender piles will be installed using a vibratory hammer and an impact hammer (operating from a barge-mounted crane) to a depth of approximately 30 feet within the substrate. All new piles will also be treated with a white, light reflective coating. Each new pile will require approximately 15 to 30 minutes of vibratory hammer use for installation. It is likely that the vibratory hammer will not fully embed the piles to the required depth given the presence of siltstone below the sediment. As such, an impact hammer will be used to seat the piles to the required depth. It is anticipated that use of an impact hammer will be needed for up to 10 feet of siltstone penetration. The contractor will initiate daily "soft-start" procedures to provide a warning and/or give animals near pile driving and removal activities a chance to leave the area prior to a vibratory or impact driver operating at full capacity; thereby, exposing fewer animals to loud underwater and airborne sounds. In addition, a biologist qualified in marine mammal identification will be on site during all pile driving and will notify the operator to cease operations if a marine mammal enters the safety zone (see Section 1.4.2 below). Up to 102 piles will be located below the HMT, resulting in approximately 300 square feet (555 cubic yards) of fill.

Based on a review of pile driving logs from previous piling installation projects (pers. comm. with Greg Morrill, Bergerson Construction, February 24, 2015), it is anticipated that any piles that cannot be fully embedded with use of a vibratory hammer, may require an average of 10

minutes of impact hammer use, at an average rate of 40 strikes per minute. Given the amount of time it takes to set the crane barge, center each pile, and switch between the vibratory hammer and impact hammer, it is estimated that the average installation rate will be four piles per day. This equates to potentially 40 minutes of impact hammer use (1,600 pile strikes) per day. Pile driving will occur intermittently over the course of approximately 12 weeks. The contractor will be required to implement appropriate sound attenuation methods (e.g., a confined or unconfined bubble curtain) as detailed in the Mitigation Measures below. It is assumed that proper use of the bubble curtain will result in 10 decibel (dB) attenuation (NMFS 2011, ICF Jones & Stokes and Illingworth & Rodkin 2009). It is possible that proper use of a bubble curtain can result in up to 20 dB attenuation depending on site specific conditions (ICF Jones & Stokes and Illingworth & Rodkin 2009).

Cold Storage Building

As stated above, the new wharf will sit level with Bay Boulevard (approximately 10 feet above msl) and will support a 4,000 square foot cold storage building and 500 square foot ice machine (see Appendix A). The proposed building will be used to cold pack local fish and shellfish for distribution. There may be some limited fish fillet processing for local distribution only. Small forklifts will be used on the wharf for unloading and loading of boats and truck trailers. Operation of the new transload facility will not require pumping of water from Yaquina Bay. All water will be provided by local utilities. In addition, no excavation or maintenance dredging will be required to construct or operate the new facility. Furthermore, operation of the new transload facility will not increase local boat traffic within the vicinity of the action area. The new facility will service local fisherman already operating within Yaquina Bay and local Newport marinas.

Stormwater

Stormwater runoff from potential pollutant generating surfaces of the new wharf deck will be sloped toward the shoreline to a catch basin where it will be process through an oil-water separator. The treated stormwater will then be piped to the City's existing stormwater system. The building will include an enamel-coated metal roof, a non-pollutant generating surface. As such, all roof runoff will be transported via gutters to Yaquina Bay.

1.3.3 Proposed Mitigation

As discussed above, the proposed new wharf will result in approximately 9,360 square feet of net new overwater structure suspended approximately 10 feet above msl. In addition, installation of new steel support pilings will result in approximately 300 square feet (555 cubic yards) of fill below the HMT of Yaquina Bay. To offset these impacts, the project will include the following mitigation measures:

- Removal of the existing Undersea Gardens and associated structures (including a wooden breakwater, storage dock, access ramp, section of pier, and approximately 25 pilings); resulting in a *net removal* of approximately 2,000 cubic yards of existing structures from below the HMT.
- The bottom of each precast wharf panel will be painted with white, light reflecting paint to improve natural light refraction under the new wharf. In addition, all new support piles will also be treated with a white, light reflective coating.
- Removal of an existing 4,800-square-foot rock jetty located approximately 4 miles upstream at River Bend Marine (see Figure 2).

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Proposed Offsite Mitigation at River Bend Marine
Front Street Marine Transload Facility Project
Newport, OR (Google Earth 2015)

FIGURE
2

Removal of Rock Jetty

The existing rock jetty at River Bend Marine measures approximately 120 feet long by 40 feet wide, covering an in-water area of approximately 4,800 square feet. Removal of the jetty will be conducted using a crane (equipped with a clamshell bucket) or an excavator, and will result in approximately 1,600 cubic yards of rock removal from below the HMT of Yaquina Bay. The crane will start at the far end of the breakwater and work back towards the shoreline, where the rock will then be transferred to a dump truck and stockpiled in an empty lot on the River Bend Marine property. Removal of the rock jetty will increase the available substrate area below the HMT, therefore providing intertidal mud-flat habitat over time.

1.4 Estimated Zone of Influence

For the proposed project, the Applicant proposes to install the steel piles using a vibratory hammer and then an impact hammer to seat the piles to the required depth. Sound pressure levels generated from pile driving activities at the project site have the potential to result in behavioral effects or even injury to marine mammals that occur in the project vicinity. As distance from the pile increases, sound attenuation from transmission loss reduces sound pressure levels and the potential harmful effects also decrease. NMFS is developing comprehensive guidance on sound characteristics that are likely to result in injury and behavioral disruption to marine mammals. Until formal guidance is finalized, NMFS uses conservative thresholds of received sound pressure levels that may cause behavioral disturbance and injury. Based on current interim guidance NMFS assumes a 160 dB root-mean-square pressure (RMS) threshold for behavioral responses from impulse sound (impact hammer) and 120 dB RMS threshold for behavioral responses from continuous sound (vibratory hammer) is appropriate for determining behavioral effects on marine mammals. NMFS assumes a 190 dB RMS threshold for injury effects on pinnipeds (NMFS 2015).

For the proposed project, the Applicant proposes to use a bubble curtain to attenuate underwater sound levels during the use of the impact hammer (bubble curtains are not proposed for use with vibratory hammers). Based on the use of a bubble curtain and pile sizes proposed for this project, the assessment of acoustic impacts presented in this assessment assumes an estimated reduction of 10 dB in sound pressure for impact pile driving (NMFS 2011, ICF Jones & Stokes and Illingworth & Rodkin 2009) (see Appendix C: Pile Driving Data) . Although reductions as high as 20 dB have been measured, as a general rule, sound reductions of greater than 10 dB with attenuation cannot be reliably predicted (ICF Jones & Stokes and Illingworth & Rodkin 2009).

The National Oceanographic and Atmospheric Administration (NOAA) practical spreading model was used to determine where underwater sound generated from pile driving activities would attenuate below the behavioral response and injury thresholds established by NMFS. The distances to the NMFS thresholds Level B harassment and Level A injury takes were calculated as described below.

1.4.1 Estimated Zone of Influence for Level B Harassment

Hydroacoustics

Using an average vibratory hammer sound level of 157 dB RMS measured at 10 meters for installation of a 24-inch steel pile (Minor 2010; ICF Jones & Stokes and Illingworth & Rodkin 2009), and a standard transmission loss constant of 15, the distance at which the sound pressure levels fall below the 120 dB RMS behavioral threshold for vibratory hammering is

approximately 1.8 miles (see Figure 3A). Daytime background sound levels were measured at 140 dB during hydroacoustic monitoring for the NOAA MOC-P Test Pile Program (Miner 2010). Because harbor seals and California sea lions are common in Yaquina Bay, it is presumed that the animals are accustomed to the background noise levels and sound levels greater than 120 dB RMS and below the 140 dB RMS background noise level are unlikely to elicit a behavioral response. The calculated distance at which the sound pressure levels fall below the 140 dB RMS threshold is 436 feet. These conservative (1.8 miles) and practical (436 feet) disturbance distances do not account for land forms and existing structures that may further reduce the limits of sound transmission.

Using 190 dB RMS at 10 meters for installation of a 24-inch steel pile with an impact hammer (ICF Jones & Stokes and Illingworth & Rodkin 2009; Minor 2010), and a standard transmission loss constant of 15, the distance at which the sound pressure levels fall below the 160 dB RMS behavioral threshold for impact hammering is approximately 0.62 miles. With a bubble curtain and an estimated 10 dB reduction in sound levels, the distance at which the sound pressure levels fall below the 160 dB RMS behavioral threshold for impact hammering is approximately 707 feet.

Airborne Noise

Illingworth and Rodkin (2012) reported unweighted in-air (i.e., airborne noise) measurements of impact driving of a 24-inch steel pile of 89 dB re 20 μPa (rms) at 50 feet. Laughlin reported unweighted in-air measurements of vibratory driving 18-inch steel piles averaging 87.5 dB re 20 μPa (rms) at 50 feet. Because the proposed project uses the same size pilings and similar construction methods, we can use the same distance (50 feet) as the ZOI for Level B harassment from airborne noise, which falls within the more conservative 1.8 mile disturbance distance for hydroacoustics.

1.4.2 Estimated Safety Zone for Level A Injury

The distance to the 190 dB RMS injury threshold for installation of a 24-inch steel pile with an impact hammer and no bubble curtain is 10 meters (32.8 feet). With a bubble curtain (estimated 10 dB reduction in sound levels) and a standard transmission loss constant of 15, the injury distance from impact hammering is reduced to approximately 7 feet (see Figure 3B).

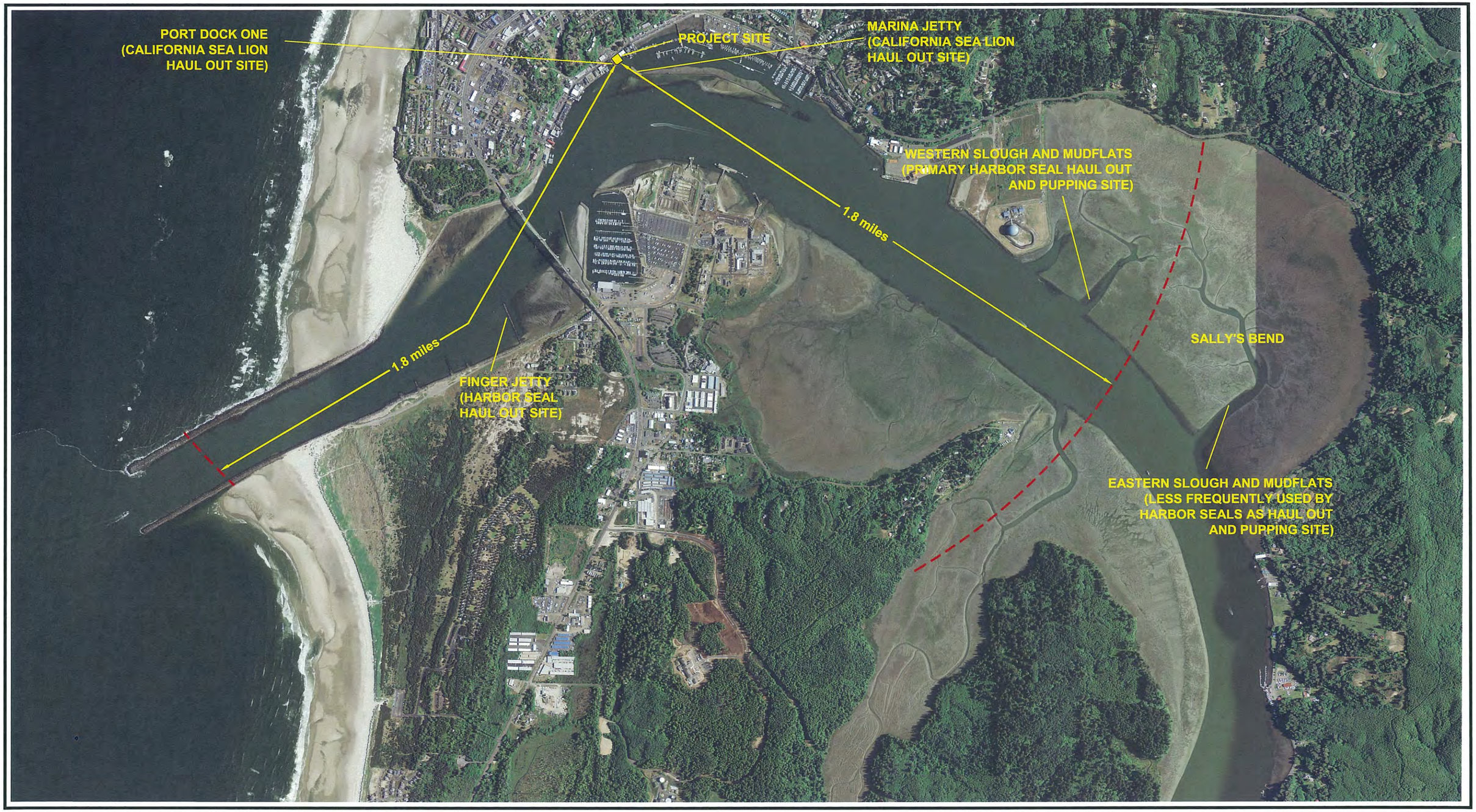
2.0 DATES, DURATION, AND LOCATION OF ACTIVITY

2.1 Dates

As discussed above, construction is scheduled to begin in November 2015, with completion of the wharf expected by September 2016. The associated cold storage building will be constructed after completion of the wharf. All work conducted below the HMT of Yaquina Bay will occur between November 1 and February 15 of the ODFW-preferred IWWW for the Yaquina River estuary (ODFW 2008).

2.2 Duration

The proposed project will require approximately 12 weeks of in-water work. It is anticipated that piling removal will require approximately 15 minutes of vibratory hammer use per pile. Removal of the existing piles will require approximately 6 hours of total vibratory hammer use over a



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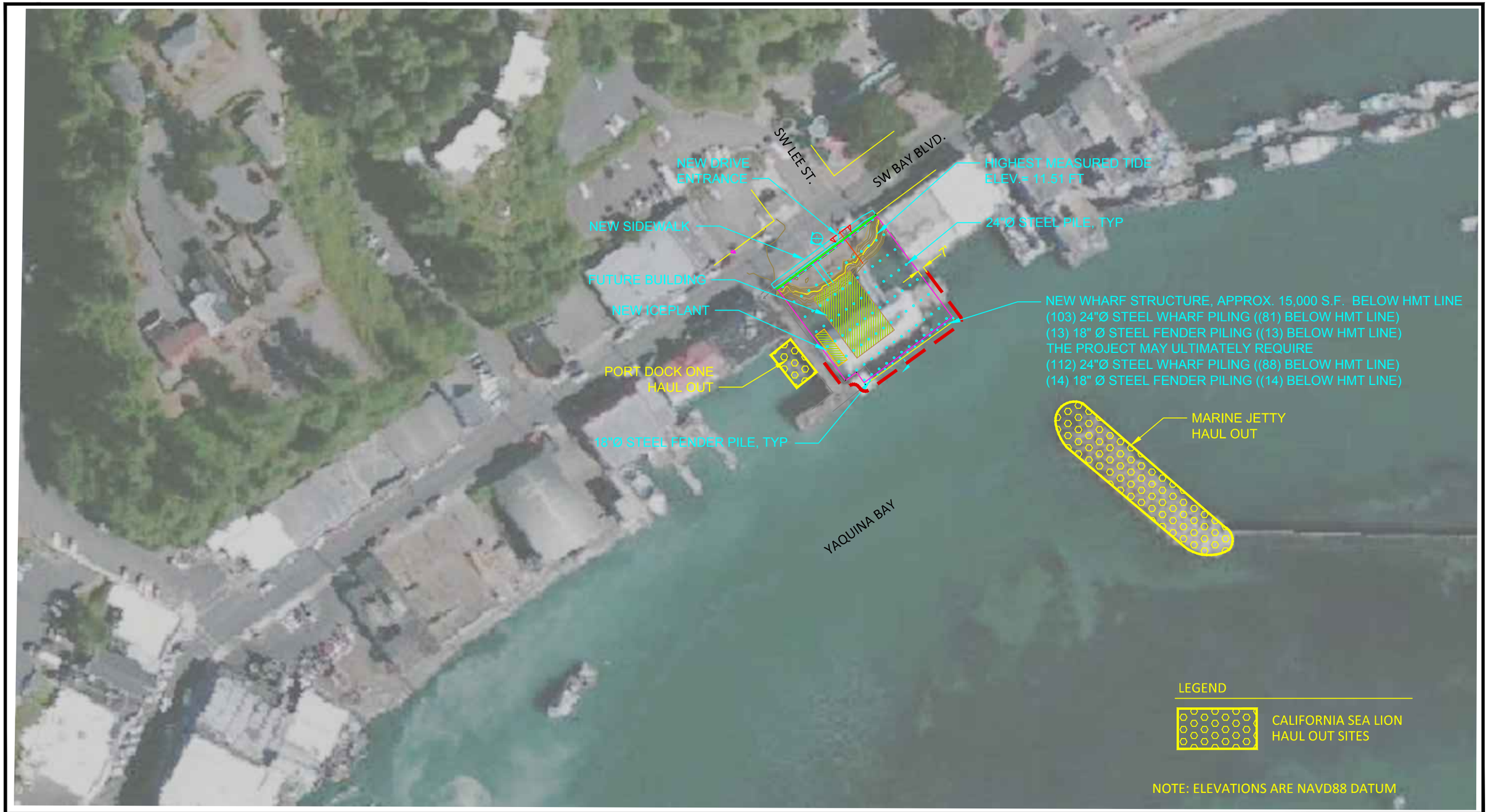
Zone of Influence
Front Street Marine Transload Facility Project

Newport, Oregon

FIGURE
3A

4-10-2015



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Safety Zone
Front Street Marine Transload Facility Project

Newport, Oregon

FIGURE 3B

4-10-2015

period of two to four in-water work days. Each *new* pile will require approximately 15 to 30 minutes of vibratory hammer use for installation. It is anticipated that any piles that cannot be fully embedded with a vibratory hammer, may require an average of 10 minutes of impact hammer use, at an average rate of 40 strikes per minute. Given the amount of time it takes to set the crane barge, center each pile, and switch between the vibratory hammer and impact hammer, it is estimated that the average installation rate will be four piles per day. This equates to potentially 40 minutes of impact hammer use (1,600 pile strikes) per day. Pile driving will occur intermittently over the course of the 12-week IWWW.

2.3 Project Location

As stated above, the proposed project is located at the site of the existing Undersea Gardens located in Yaquina Bay along Bay Boulevard in Newport, Oregon (see Figure 1).

3.0 MARINE MAMMAL SPECIES AND NUMBERS

This section has been combined with Section 4.0, Status and Distribution of Affected Species for ease of discussion. This combined section discusses the species and numbers of each species expected to occur within the action area at the time of construction as well as the status, distribution, and seasonal occurrence of each species or stocks of marine mammals likely to be affected by the proposed activity.

Two species of marine mammal are known to occur regularly within the project action area, including the harbor seal (*Phoca vitulina*) and California sea lion (*Zalophus californianus*). Two additional species, Steller sea lion (*Eumetopias jubatus*) and killer whale (*Orcinus orca*), occur in Yaquina Bay on rare occasions, but are not expected to be present within the project action area at the time of proposed in-water work, as discussed below.

3.1 Harbor Seal

Harbor seals are found in coastal and estuarine water of the North Pacific Ocean from Baja California through the Aleutian Islands and northward into the Bering Sea to the Pribilof Islands. They haul out on rocks, reefs, beaches, and ice. Harbor seals feed primarily in coastal marine and estuarine waters and occasionally fresh waters (Caretta et al 2014). In Oregon harbor seals commonly haul out on estuarine mudflats, sandy beaches, rocky shores, and offshore rocks and islands (ODFW 2015). The harbor seal is not listed as threatened or endangered under the Federal Endangered Species Act (ESA).

Harbor seals are known to regularly haul out at three sites in Yaquina Bay: the finger jetty west of the Highway 101 bridge, the western slough and mudflats in Sally's Bend, and the eastern slough and mudflats in Sally's Bend. Harbor seals also haul out at the Oyster Dock, which is on the Yaquina River, approximately four miles upstream from the project site. The finger jetty is approximately 4,300 feet (0.8 miles) southwest of the project site, and the western slough and mudflats haul out is approximately 8,700 feet (1.6 miles) southeast of the project site (Figure 3A).

Counts of harbor seals at the finger jetty and the Oyster Docks were made between October 15, 2010 and February 25, 2011 as part of the marine mammal monitoring done at the time of pile

driving associated with construction of the new dock facility for NOAA's Pacific fleet. Numbers recorded during this time period fluctuated greatly (e.g., zero on the finger jetty on November 10, but 116 [the largest number observed during the study] on November 11). Numbers of harbor seals recorded during this study peaked in mid-November, with a general steady decline through the end of the study period. However, because there are no historical data on the numbers and distribution of harbor seals in Yaquina Bay, it is not possible to know if these numbers are typical for Yaquina Bay.

The mean count of harbor seals along the Oregon coast and Columbia River from aerial surveys of harbor seals conducted during the 1999 pupping season was 5,735 animals (including pups). However, no recent data is available to determine a minimum population estimate for the Oregon coast (Caretta et al 2014).

3.2 California Sea Lion

California sea lions range along the Pacific coast from central Mexico to British Columbia but breed only on islands in southern California, western Baja California, and the Gulf of California (Caretta et al. 2011). California sea lions inhabit coastal and estuarine waters and haul out on beaches, docks, jetties and buoys. The California sea lion is not listed as threatened or endangered under the ESA.

The occurrence of California sea lions in Yaquina Bay, as well as along the entire Oregon coast, is seasonal. California sea lions generally arrive in Yaquina Bay in late summer, with numbers growing into the fall and decreasing again through the spring. California sea lions are generally absent from Yaquina Bay June through mid- to late-August. Primary haul out sites for California sea lions within Yaquina Bay include Port Dock One and the nearby Marina Jetty. Port Dock One is immediately adjacent to the project site.

Historical counts of California sea lions at Port Dock One and the Marina Jetty conducted between 2003 and 2008 show that sea lion numbers in Yaquina Bay are highest in fall and decline substantially in early to mid-winter in most years; however, the number of California sea lions in Yaquina Bay fluctuate greatly from year to year. During that period, a maximum count of 354 sea lions was made on December 2, 2003. That winter, the number of sea lions remained relatively high through the winter and did not drop below 100 until late February 2004. During the marine mammal monitoring conducted as part of the construction of the new dock facility for NOAA's Pacific fleet, a peak of 629 sea lions was counted on October 27, 2010 (just prior to the proposed project IWWW) with a smaller peak of 425 on November 3. The number of sea lions in Yaquina Bay declined and fluctuated until December 3 when 169 sea lions were counted. After that date, the number of sea lions recorded during the monitoring declined again and remained below 17 sea lions through the end of February 2011. A minimum of two California sea lions were observed at the haul outs on several dates within the period.

3.3 Steller Sea Lion

Steller sea lions range around the northern Pacific Rim from northern Japan to southern California. Within the U.S., the species has been divided into two populations: the Western Distinct Population Segment (DPS) and the Eastern DPS, which includes Steller sea lions found

in Oregon waters. The eastern DPS was listed as threatened until 2013, when it was formally delisted (NMFS 2013).

Oregon has the largest population of breeding Steller sea lions south of Alaska. In Oregon, Steller sea lions occupy three rookery sites (located at Rogue Reef, Orford Reef, and Three Arch Rocks) and eight haul out sites. Steller sea lions forage at sea off the entire Oregon coast as well as in the lower Columbia River and the mouth of the Rogue River. A 2006 survey conducted by the Washington Department of Fish and Wildlife (WDFW) estimated up to 1,000 Steller sea lions and 1,200 California sea lions in the lower Columbia River (WDFW 2015). However, marine biologists with the Oregon Department of Fish and Wildlife note that Steller sea lions, are rarely seen in Yaquina Bay (PHS 2010). Because they rarely occur within Yaquina Bay, Steller sea lions are not expected to be present within the project area at the time of in-water construction.

3.4 Killer Whale

Killer whales occur in all oceans, but are most common in coastal waters and at higher latitudes. Killer whales in the Eastern North Pacific region have been classified into three forms, or ecotypes: resident, transient, and offshore whales; and these forms differ genetically, morphologically, ecologically, and behaviorally. The Southern Resident killer whale population consists of three pods (Pods J, K, and L) that spend much of the summer and fall in the inland waterways of the Strait of Georgia, Strait of Juan de Fuca, and Puget Sound. Pods have visited coastal sites off Washington and Vancouver Island, and they are known to travel as far south as central California and as far north as the Queen Charlotte Islands, British Columbia. Information on winter and early spring movements and distribution of Southern Residents along the outer Pacific Coast is limited, with only 38 confirmed coastal sightings between 1975 and 2007 (NMFS 2008). The Southern Resident killer whale is the only population of killer whales listed under the ESA.

All three forms of killer whale (i.e., resident, transient and offshore) occur in Oregon waters. As noted above, Southern Resident killer whales travel from their core range in the inland waterways of the Strait of Georgia, Strait of Juan de Fuca, and Puget Sound to coastal waters, including the Oregon coast. Members of the Southern Resident population have been definitively recorded in Lincoln County waters on three occasions: off Depoe Bay, April 1999; off Yaquina Bay, week of March 20, 2000; and off Depoe Bay, April 14, 2000 (NMFS 2008).

According to ODFW marine biologists, killer whales are known to enter Yaquina Bay, but such occurrences generally occur infrequently (once a year or once every few years), and the whales do not remain in the bay for long (PHS 2010). Most records of killer whales in Yaquina Bay are from April and May. It is thought that when killer whales do enter the bay it is in pursuit of food. There is a report of a killer whale pursuing a seal up the Yaquina River almost as far as Toledo (AP 2007), and a pod of five killer whales were observed to catch and eat a sea lion in Yaquina Bay (The Bulletin 1981). These observations suggest that the killer whales that are occasionally observed in Yaquina Bay are likely from the non-listed transient population rather than the Southern Resident population since the transient population feeds almost exclusively on marine mammals and the Southern Resident population feeds primarily on fish (NMFS 2008). In email correspondence dated March 16, 2010, Brent Norberg of the NMFS also stated that the killer whales observed in Yaquina Bay are thought to be from the non-listed transient population.

Given the rarity of Southern Resident killer whales off the Oregon Coast (only three definitively documented occurrences), it is likely that this species occurs only very rarely within the project area, and such occurrences are most likely to occur, based on known occurrences, in March or April, outside of the period in which in-water work for the proposed project will occur.

4.0 STATUS AND DISTRIBUTION OF AFFECTED SPECIES

This section has been combined with Section 3.0.

5.0 TYPE OF INCIDENTAL TAKE AUTHORIZATION REQUESTED

The Applicant requests the issuance of an IHA pursuant to Section 101(a)(5) of the MMPA for incidental take of harbor seals and California sea lions by Level B harassment during its planned piling removal and piling installation associated with the construction of the proposed Front Street Marine facility. All piling removal and piling installation will occur between November 1, 2015 and February 15, 2016.

The activities outlined in Section 1 have the potential to result in Level B harassment of marine mammals by exposure to underwater sound. Take will potentially result from the following aspects of the proposed project:

- The use of a vibratory hammer to remove pilings associated with the existing Undersea Garden;
- The use of a vibratory hammer to install pilings for the proposed Front Street Marine facility; and
- The use of an impact hammer to install pilings for the proposed Front Street Marine facility.

Level B harassment (i.e., behavioral disturbance) may occur when seals and/or sea lions enter the 120 dB ZOI, which extends a maximum of 1.8 miles from the work area, as described in Section 1.4, above.

6.0 NUMBER OF MARINE MAMMALS THAT MAY BE AFFECTED

As discussed in Section 2, above, only harbor seals and California sea lions are expected to forage or haul out within the ZOI for the proposed project. Incidental take of harbor seals and California sea lions as a result of the proposed project is estimated by determining the likelihood of each species being present within the ZOI during active piling removal and installation. Expected presence for each species is estimated based on data collected during past observations from Yaquina Bay during the proposed IWWW (November 1 – February 15) and best professional judgment. All estimates are conservative.

As discussed above, the proposed project involves the removal of approximately 25 existing pilings and the installation of up to 126 pilings, 102 of which will be located below the limits of HMT. Piling removal is anticipated to take approximately 15 minutes per piling using a vibratory hammer. Piling removal is anticipated to take a total of six hours over a period of two to four

days. To be conservative, this analysis assumes piling removal will occur on four days during the IWWW. Piling installation is anticipated to require 15 to 30 minutes of vibratory hammering with up to 10 minutes of additional impact hammering per piling. The contractor estimates that four pilings will be installed per day. Using these estimates, it is anticipated that approximately 26 days will be required for piling installation.

6.1 Harbor Seal

Harbor seals forage and haul out in Yaquina Bay during the time frame in which in-water work for the proposed project will occur. Primary haul out sites include the finger jetty to the west of the Highway 101 bridge (approximately 4,300 feet [0.8 miles] southwest of the project site); two haul outs on the mudflats of Sally's Bend, (approximately 8,700 feet [1.6 miles] and 11,500 feet [2.2 miles] southeast of the project site); and the oyster docks located in the Yaquina River approximately four miles upstream of the project site. Harbor seals forage throughout the estuary; however, data on the density of harbor seals within the estuary away from haul sites is not available. Because harbor seals forage throughout the estuary, it is likely that individual harbor seals will be exposed to Level B harassment underwater noise thresholds. While harbor seals could potentially forage in the vicinity of the project site, it is anticipated that conservation measures such as the use of "soft start" procedures will cause any harbor seals that might be in the project area to leave prior to the start of construction, and it is unlikely that any harbor seals will be exposed to Level A injury underwater noise thresholds. In addition, a biologist qualified in marine mammal identification will be on site during all pile driving and will notify the operator to cease operations if a marine mammal enters the 7-foot safety zone.

Few data have been collected on the number of harbor seals in Yaquina Bay; however, the numbers of harbor seals using two haul outs (the finger jetty and oyster docks) were recorded in 2010 and 2011 as part of monitoring efforts conducted during the construction of the NOAA docks. Data are not available for the number of harbor seals that forage in Yaquina Bay waters adjacent to the project site; nor are data available for the number of harbor seals that use the haul out sites in the Sally's Bend area of Yaquina Bay. Therefore, this estimate of incidental take uses a conservative approach and presumes that all harbor seals that use the finger jetty haul out (the haul out closest to the project site for which data are available) could be exposed to Level B harassment underwater noise thresholds.

The number of harbor seals recorded at the finger jetty by monitoring efforts conducted during the construction of the NOAA facility fluctuated widely and ranged from a high of 116 to a low of zero. Review of data from that monitoring effort show an average daily count of 25 harbor seals at the finger jetty haul out between November 1 and February 15, the dates of the in-water work window for the Yaquina estuary. Because of the wide fluctuation in the number of seals at the haul out on any given day, this average daily number is used as a conservative estimate of the number of seals anticipated to be subjected to Level B harassment over the course of the proposed piling removal and installation activities.

Level B Harassment of Harbor Seals

Level B harassment (i.e., behavioral harassment) may result to seals that occur within the ZOI where sound levels exceed the 120 dB threshold (140 dB, if background noise is taken into consideration). As discussed above, this ZOI is estimated to extend approximately 1.8 miles from

the project site, or approximately 436 feet if existing background noise is taken into consideration. As noted above, the finger jetty haul out site is located approximately 4,300 feet (0.8 miles) southwest of the proposed project. Because of this proximity, all seals that might use haul out at the finger jetty during the in-water construction period could potentially forage within the 1.8-mile ZOI for Level B harassment, and the average daily number of seals using this haul out is used to estimate the potential take from Level B harassment, as follows:

Exposure estimate = N * 30 days for pile removal and installation, where

N = number of animals (25)

Exposure estimate = 25 animals per day * 30 days = 750 animals

The Applicant is requesting authorization of Level B harassment of 750 harbor seals. It is presumed that this number may include multiple harassments of the same individual(s).

6.2 California Sea Lion

California sea lions haul out at two primary locations in Yaquina Bay, including Port Dock One and the Marina Jetty. The Port Dock One haul out is located approximately 20 feet southwest of the project site. The closest point of the Marina Jetty is approximately 163 feet southeast of the project site; the entire Marina Jetty is within 400 feet of the project site. This estimate of potential incidental take uses a conservative approach and presumes that all California sea lions that use both haul outs may be exposed to Level B harassment.

As discussed above, the number of California sea lions recorded by monitoring efforts conducted during the construction of the NOAA facility fluctuated widely and ranged from a high of 425 to a low of two animals observed at the haul outs in Yaquina Bay. Review of data from that monitoring effort show an average daily count of ten California sea lions at the Port Dock One haul out and 27 at the Marina Jetty haul out between November 1 and February 15, the dates of the IWWW for the Yaquina estuary. Because of the wide fluctuation in the number of sea lions at the haul outs on any given day, this average daily number of sea lions at the haul outs is used to estimate the number of sea lions anticipated to be subjected to Level B harassment over the course of the proposed piling removal and installation activities.

Level B Harassment of California Sea Lions

Level B harassment (i.e., behavioral harassment) may result to sea lions that occur within the ZOI where sound levels exceed the 120 dB threshold (140 dB, if background noise is taken into consideration). As discussed above, this ZOI is estimated to extend approximately 1.8 miles from the project site, or approximately 436 feet if existing background noise is taken into consideration. As noted above, both the Port Dock One and Marina Jetty haul out sites are located within 400 feet of the proposed project. Because of this proximity, all sea lions that might use these haul outs during the in-water construction period could potentially be subjected to Level B harassment, and the average daily number of sea lions using the haul outs is used to estimate the potential take from Level B harassment, as follows:

Exposure estimate = N * 30 days for pile removal and installation, where

N = number of animals (37)

Exposure estimate = 37 animals per day * 30 days = 1,100 animals

The Applicant is requesting authorization of Level B harassment of 1,100 California sea lions. It is presumed that this number may include multiple harassments of the same individual(s).

7.0 ANTICIPATED IMPACTS ON MARINE MAMMAL SPECIES

As discussed in Section 6 above, the Applicant requests authorization for the incidental take of 750 harbor seals and 1,100 California sea lions through Level B harassment. These estimates assume multiple takes of relatively few individuals over the course of the project rather than single takes of 1,850 individual animals. These numbers relative to the overall stock size and the effect that harassment could have to individual recruitment or survival for harbor seals and California sea lions are discussed below.

7.1 Anticipated Impact on Oregon/Washington Coast Harbor Seal Stock

There are no current abundance estimates for the Oregon/Washington Coast stock of harbor seals, but in 1999, the population was estimated to contain approximately 24,732 individuals (Carretta et al. 2014). This application requests incidental take by Level B harassment of 750 harbor seals. Although the estimate assumes multiple take of a few individuals (not single takes of 750 individuals) the requested number of takes represents 3.03% of the Oregon/Washington Coast stock.

Local harbor seals are accustomed to disturbance by local recreational and commercial activities (small and large vessels, including recreational vessels, commercial fishing boats, and NOAA research vessels) throughout the area on a daily basis. Additionally, marine mammal monitoring conducted during the construction of the NOAA facilities in 2010/2011 was not able to correlate behavioral changes or a decline in numbers of marine mammals in Yaquina Bay with pile driving activities associated with that project (Lagerquist et al. 2011). If incidental take from Level B harassment occurs as a result of the proposed project, it is anticipated to result only in short-term changes in behavior and potential temporary hearing threshold shift. These takes would be unlikely to have any impact on stock recruitment or survival and therefore, would have a negligible impact on the U.S. stock.

7.2 Anticipated Impact on U.S. California Sea Lion Stock

The U.S. stock of California sea lions is estimated to contain approximately 296,750 individuals (Carretta et al. 2011). This application requests incidental take by Level B harassment of 1,100 California sea lions. Although the estimate assumes multiple take of a few individuals (not single takes of 1,100 individuals) the requested number of takes represents 0.37 % of the entire U.S. stock.

California sea lions in Yaquina Bay are accustomed to disturbance by local recreational and commercial activities (small and large vessels, including recreational vessels, commercial fishing boats, and NOAA research vessels) throughout the area on a daily basis. Because of the very

close proximity of the Port Dock One haul out to the construction site, it is presumed that California sea lions will avoid the Port Dock One haul out once construction begins despite the sea lions' habituation to human activity in the area. It is also anticipated that the implementation of a "soft start" of hammer use during piling removal and installation will "haze" the sea lions, driving them from the construction site prior to the start of work, and discouraging them from using the Port Dock One haul out and avoid the Level A safety zone during construction. Additionally, marine mammal monitoring conducted during the construction of the NOAA facilities in 2010/2011 was not able to correlate behavioral changes or a decline in numbers of marine mammals in Yaquina Bay with pile driving activities associated with that project (Lagerquist et al. 2011). If incidental take from the proposed project, it is anticipated to result only in short-term changes in behavior and potential temporary hearing threshold shift. These takes would be unlikely to have any impact on stock recruitment or survival and therefore, would have a negligible impact on the U.S. stock.

8.0 ANTICIPATED IMPACTS ON SUBSISTENCE USE

There are no known subsistence uses of harbor seals or California sea lions within the project area. No impacts on the availability of the species or stocks to the Pacific Northwest treaty tribes are expected as a result of the proposed project.

9.0 ANTICIPATED IMPACTS ON MARINE MAMMAL HABITAT

Construction activities will have temporary impacts on marine mammal habitat associated with increased in-air noise and in-water sound pressure levels from pile removal and driving. Other potential temporary changes are water quality (primarily through potential localized increases in turbidity levels) and prey species distribution. Best management practices (BMPs) and conservation measures used to minimize potential environmental effects from project activities are outlined in Section 11 (Mitigation Measures).

10.0 ANTICIPATED IMPACTS OF LOSS OR MODIFICATION OF HABITAT

The Project is not expected to result in a permanent loss or modification of habitat for marine mammals or their food sources. The most likely effects on marine mammal habitat resulting from the proposed project are temporary, short duration underwater noise, prey disturbance, and water quality effects. The direct loss of habitat available to marine mammals during construction due to noise, water quality impacts and construction activity is anticipated to be minimal. The implementation of the mitigation described above in Section 1.3.3 will ensure that there is no permanent loss of habitat for marine mammal prey species.

11.0 MITIGATION MEASURES

Appropriate conservation measures and best management practices (BMPs) have been incorporated into the proposed project design to minimize and avoid adverse effects to marine mammals from underwater noise generated by pile removal and installation activities, as well as minimize adverse effects to marine mammal habitat and the habitats of their prey species. These conservation measures and BMPs will include the following:

- All work conducted below the HMT of Yaquina Bay will occur between November 1 and February 15 of the ODFW-preferred IWWW for the Yaquina River estuary.
- All heavy equipment (i.e., crane) will access the project site via existing roadways and floating barges.
- All piles will be removed with a vibratory hammer.
- During piling removal, the following steps will be used to minimize creosote release, sediment disturbance and sediment resuspension:
    - Install a floating surface boom to capture floating surface debris.
    - Keep all equipment (e.g., bucket, cable, vibratory hammer) out of the water, grip piles above the waterline, and complete work during low water and low current conditions.
    - Dislodge the piling with a vibratory hammer, when possible; never intentionally break a pile.
    - Slowly lift the pile from the sediment and through the water column.
    - Place the pile in a containment basin on a barge deck, pier, or shoreline without attempting to clean or remove any adhering sediment.
    - Fill the holes left by each piling with clean, native sediments immediately upon removal.
- Dispose of all removed piles, floating surface debris, any sediment spilled on work surfaces, and all containment supplies at a permitted upland disposal site.
- When a pile breaks or is intractable during removal, removal will continue as follows:
    - Every attempt short of excavation will be made to remove each piling, if a pile in uncontaminated sediment is intractable, breaks above the surface, or breaks below the surface, cut the pile or stump off at least 3 feet below the surface of the sediment.
- The following conditions will apply when removing preservative treated wood:
    - To the extent possible, ensure no wood debris falls into the water. If wood debris does fall into the water, remove it immediately
    - Wood debris will be placed in an appropriate dry storage site until it can be disposed.
    - Wood debris will not be left in the water or stacked on the bank at or below HMT.
    - Wood debris removed during the project will be evaluated to ensure proper disposal.
- New pilings will be round steel, 24 inches in diameter or smaller. In the event that the vibratory hammer cannot fully embed the installed piles to the necessary depth, the contractor will use an impact hammer to seat the piles to the required depth. Use of an impact hammer will be limited to daylight hours between 7 a.m. and 7 p.m.
- During the use of the impact hammer a multi-level bubble curtain will be installed to reduce sound pressure levels. The bubble curtain system shall conform to the following:

    - If water velocity is greater than 1.6 feet per second, surround the piling being driven by a confined bubble curtain (*e.g.*, a bubble ring surrounded by a fabric or non-metallic sleeve) that will distribute air bubbles around 100 percent of the piling perimeter for the full depth of the water column.
    - Piling shall be completely engulfed in bubbles over the full depth of the water column at all times when an impact pile driver is in use. Bubbles are not required during vibratory pile driving.
    - Air shall be delivered from bubbler ring assemblies ("bubblers") at intervals shown on the plans.
    - Bubblers shall completely surround the pile. Bubbler minimum dimensions shall be as shown on the plans.
- The contractor will initiate daily "soft-start" procedures to provide a warning and/or give animals near pile driving and removal activities a chance to leave the area prior to a vibratory or impact driver operating at full capacity; thereby, exposing fewer animals to loud underwater and airborne sounds.
    - A soft start procedure will be used at the beginning of in-water pile driving and removal or any time pile driving has ceased for more than 30 minutes.
    - For impact pile driving, the contractor will provide an initial set of strikes from the impact hammer at reduced energy, followed by a 30-second waiting period, then two subsequent sets. (The reduced energy of an individual hammer cannot be quantified because of variations between individual drivers. Also, the number of strikes will vary at reduced energy because raising the hammer at less than full power and then releasing it results in the hammer "bouncing" as it strikes the pile resulting in multiple "strikes").
    - For vibratory pile driving, the contractor will initiate noise from vibratory hammers for 15 seconds at reduced energy followed by a 30-second waiting period. The procedure shall be repeated two additional times.
- A biologist qualified in marine mammal identification will be on site during all pile driving and will notify the operator to cease operations if a marine mammal enters the 7-foot safety zone.
- A Pollution Control Plan (PCP) will be prepared by the Contractor and carried out commensurate with the scope of the project that includes the following:
    - Best management practices to confine, remove, and dispose of construction waste.
    - Procedures to contain and control a spill of any hazardous material.
- All conditions of ODEQ's 401 Water Quality Certification will be followed.
- Only enough supplies and equipment to complete the project will be stored on site.
- All equipment will be inspected daily for fluid leaks, any leaks detected will be repaired before operation is resumed.
- Stationary power equipment (i.e., cranes) operated within 150 feet of Yaquina Bay will be diapered to prevent leaks.

- Contractor will implement a Marine Mammal Monitoring Plan as outlined in Section 13 below.

12.0 ARTIC SUBSISTENCE PLAN OF COORPERATION

The proposed project will take place in Yaquina Bay in the City of Newport, Oregon. No activities associated with this project will occur in or near any traditional Arctic subsistence hunting areas; therefore, this section is not applicable.

13.0 MONITORING AND REPORTING

The Applicant has developed a monitoring plan that will collect sighting data for each marine mammal species observed during pile removal activities. Monitoring for marine mammal presence will take place 30 minutes before, during, and 30 minutes after piling removal and piling installation. Marine mammal behavior, numbers of individuals observed, frequency of observation and the time corresponding to the daily tidal cycle will also be included. Qualified marine mammal observers will be present on site during pile removal. Details of the monitoring plan and follow-up reporting are provided below

13.1 Monitoring to Estimate Take Levels

The Applicant proposes the following Marine Mammal Monitoring Plan in order to estimate actual project take levels in the ZOI:

- During pile removal and installation, two land-based marine mammal observers will monitor the area from the best observation points available. If weather conditions prevent adequate land-based observations, boat-based monitoring may be implemented.
- To verify the required monitoring distance, the Level B acoustical harassment ZOI will be determined by using a range finder or hand-held global positioning system device.
- The vibratory Level B acoustical harassment ZOI will be monitored for the presence of marine mammals 30 minutes before, during, and 30 minutes after any pile removal activity.
- Monitoring will be continuous unless the contractor takes a significant break of longer than one hour, in which case, monitoring will be required 30 minutes prior to restarting pile removal.
- If marine mammals are observed, their location within the ZOI, and their reaction (if any) to pile-driving activities will be documented.
- The operator will cease pile driving operations if a marine mammal enters the 7-foot safety zone.

13.2 Minimum Qualifications for Marine Mammal Observers

Qualifications for marine mammal observers include the following:

- 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 correctly identify the target.
- Experience or training in the field identification of marine mammals (cetaceans and pinnipeds).
- Sufficient training, orientation or experience with the construction operation to provide for personal safety during observations.
- Ability to communicate orally, by radio or in person, with project personnel to provide real time information on marine mammals observed in the area as necessary.
- Experience and ability to conduct field observations and collect data according to assigned protocols (this may include academic experience).
- Writing skills sufficient to prepare a report of observations that would include such information as the number and type of marine mammals observed; the behavior of marine mammals in the project area during construction, dates and times when observations were conducted; dates and times when in water construction activities were conducted; dates and times when marine mammals were present at or within the Level B acoustical harassment ZOI; dates and times when pile removal was paused due to the presence of marine mammals.

13.3 Monitoring Report

The Applicant will provide NMFS with a draft monitoring report within 90 days of the conclusion of monitoring. This monitoring report will include the following information:

1. Dates on which in-water work construction occurred,
2. A summary of mitigation measures implemented to minimize adverse effects from underwater noise,
3. Marine mammal sightings, including the following information:
    a. Number and species of marine mammals sighted within harassment zones,
    b. Description of observed marine mammal behaviors (including in the presence and absence of activities),
    c. Environmental condition such as weather, visibility, sea state, etc. when observations were made,
4. Occurrences of incidental harassment, if any,
5. Documentation of observer qualifications or training,
6. Any other pertinent information.

If comments are received from the NMFS Regional Administrator on the draft report, a final report will be submitted to NMFS within 30 days thereafter. If no comments are received, the draft report will be considered to be the final report.

14.0 SUGGESTED MEANS OF COORDINATION

In-water noise generated by piling removal and installation at the project is the primary issue of concern relative to marine mammals. The monitoring report, which will include a discussion of behavioral changes in harbor seals and sea lions resulting from the proposed in-water work, will

be submitted to NMFS, and therefore, the monitoring report will be available to public review in the future. As such, the Applicant and other project proponents who might undertake similar projects in the future will be able to use the results of this project's monitoring report to inform future project designs and plan projects that minimize the take of marine mammals associated with pile driving and removal activities.

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Appendix A

Project Plan Sheets

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FRONT ST MARINE, LLC

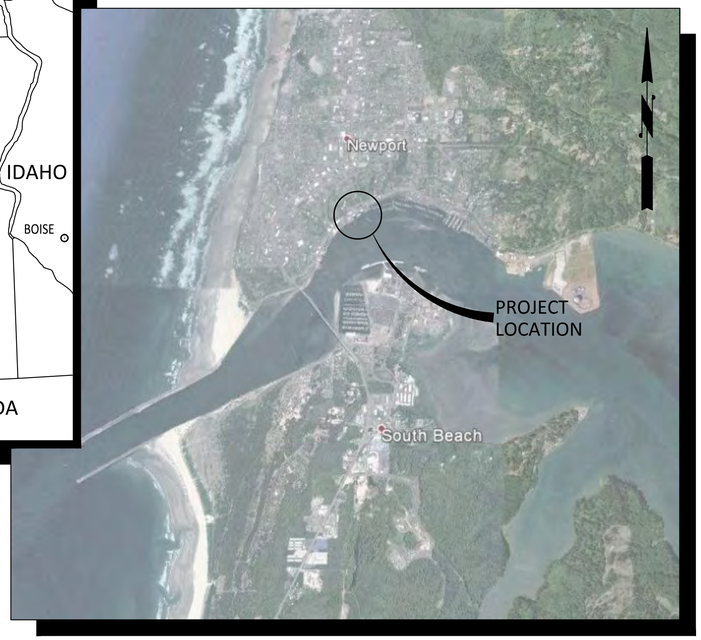
SITE IMPROVEMENTS
FRONT ST WHARF

OREGON KEY MAP

TIDAL DATA

	MLLW (feet)	NAVD88 (feet)
BASE FLOOD	13.74	13.00
HMT	12.25	11.51
MHHW	8.34	7.60
MHW	7.65	6.91
MTL	4.52	3.78
MSL	4.46	3.72
DTL	4.17	3.43
MLW	1.38	0.64
NAVD88	0.74	0.00
MLLW	0.00	-0.74
MIN	-3.52	-4.26

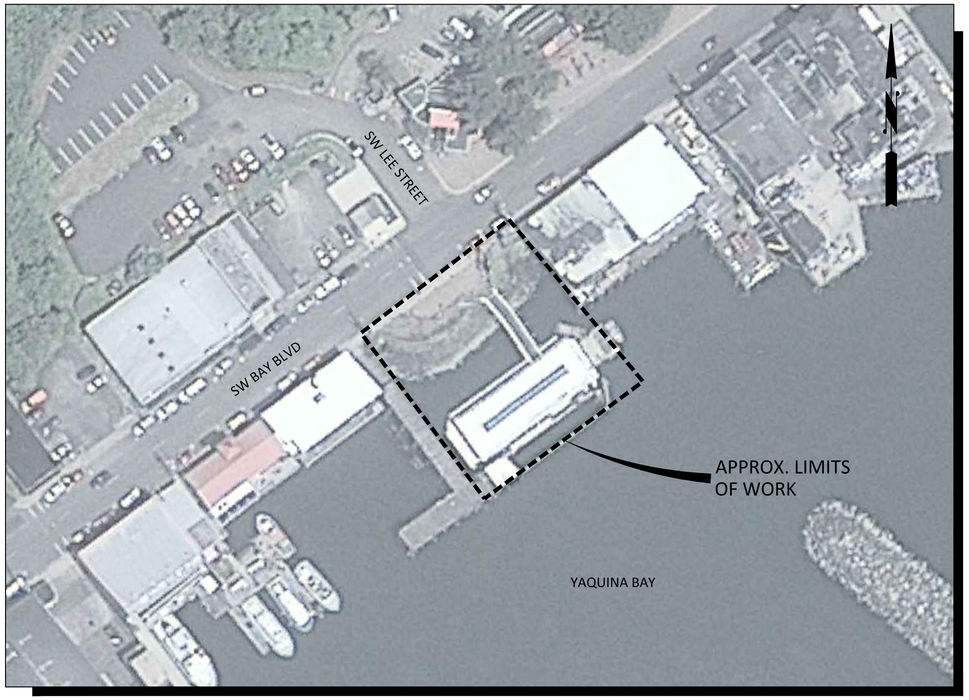
BASE FLOOD	100-YEAR FLOOD
HMT	Highest Measured Tide (12-11-1969)
MHHW	Mean Higher-High Water
MHW	Mean High Water
MTL	Mean Tide Level
MSL	Mean Sea Level
DTL	Mean Diurnal Tide Level
MLW	Mean Low Water
NAVD88	NAVD88 Datum
MLLW	Mean Lower-Low Water
MIN	Lowest Observed Water Level (6/1/1973)



VICINITY MAP

SHEET INDEX

G-01 COVER SHEET
C-01 EXISTING SITE PLAN/DEMOLITION PLAN
C-02 PROPOSED SITE PLAN
S-01 WHARF SECTION



LOCATION MAP
(NEWPORT, OREGON)

PERMIT SET

MARK	REVISION DESCRIPTION	BY	APP.	DATE

BergerABAM
700 NE Multnomah Street, Suite 900
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(503) 872-4100 FAX: (503) 872-4101

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FAX: (503) 325-0174

REGISTERED PROFESSIONAL ENGINEER 48114PE OREGON JAN. 23, 2001 HOWARD A. WELLS, III
PRELIMINARY
RENEWS: 06/30/16

DRAWN BY TNP
DESIGN BY DAW
CHECK BY DTJ
PROJ MGR HAW

FRONT ST MARINE LLC
FRONT ST WHARF
COVER SHEET

DRAWING NO. G-01
PROJECT NO. A15.0232.00
DATE: 3/17/15
SHEET NO. 1 OF 4

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REGISTERED PROFESSIONAL ENGINEER 48114PE PRELIMINARY OREGON JAN. 23, 2007 HOWARD A. WELLS III
RENEWS: 06/30/16

DRAWN BY	TNP
DESIGN BY	DAW
CHECK BY	DTJ
PROJ MGR	HAW

FRONT ST MARINE LLC

FRONT ST WHARF

EXISTING SITE PLAN/DEMOLITION PLAN

DRAWING NO.	C-01
PROJECT NO.	A15.0232.00
DATE:	3/17/15
SHEET NO.	2 OF 4

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NOTE: ELEVATIONS ARE NAVD88 DATUM

PERMIT SET

MARK	REVISION DESCRIPTION	BY	APP.	DATE

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REGISTERED PROFESSIONAL ENGINEER 48114PE PRELIMINARY OREGON JAN. 23, 2004 HOWARD A. WELLS, III
RENEWS: 06/30/16

DRAWN BY	TNP
DESIGN BY	DAW
CHECK BY	DTJ
PROJ MGR	HAW

FRONT ST MARINE LLC

FRONT ST WHARF

PROPOSED SITE PLAN

DRAWING NO.	C-02
PROJECT NO.	A15.0232.00
DATE:	3/17/15
SHEET NO.	3 OF 4

Last Saved by: Tony pritchett on: Mar 17, 2015 3:41 PM File: Q:\Portland\2015\A15.0232\00\CADD\Dwgs\Permit Dwgs\02_C02-P.dwg

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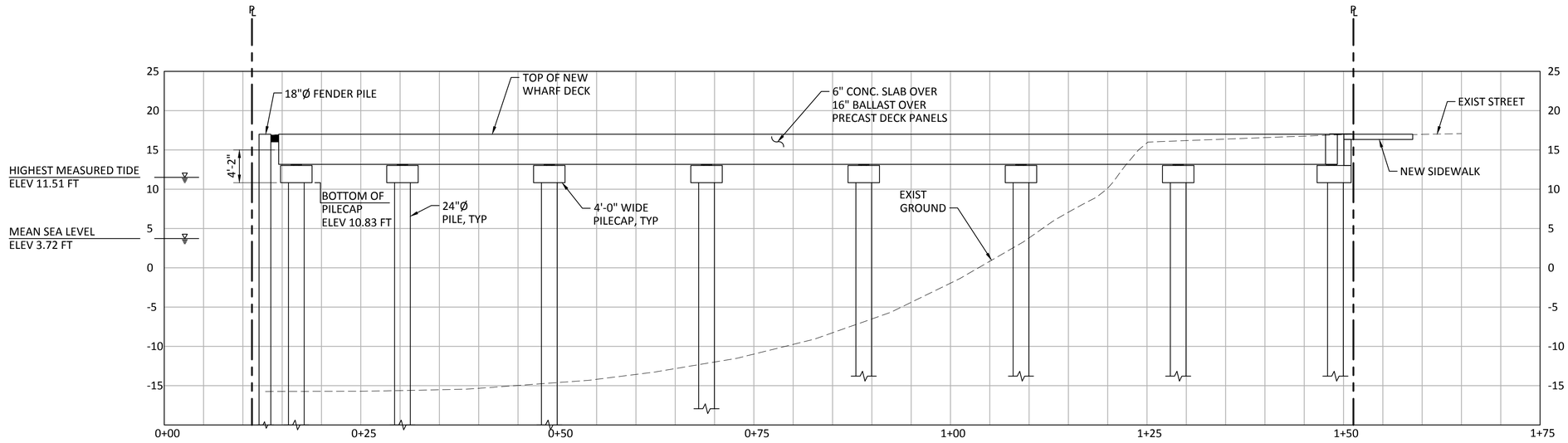

A / C-2 **WHARF ELEVATION**
SCALE: 1/8"=1'-0"

NOTE: ELEVATIONS ARE NAVD88 DATUM

PERMIT SET

MARK	REVISION DESCRIPTION	BY	APP.	DATE

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Portland, Oregon 97232-4189
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REGISTERED PROFESSIONAL ENGINEER 48114PE OREGON JAN. 23, 2001 HOWARD A. WELLS III
PRELIMINARY
RENEWS: 06/30/16

DRAWN BY	TNP
DESIGN BY	DAW
CHECK BY	DTJ
PROJ MGR	HAW

FRONT ST MARINE LLC
FRONT ST WHARF
WHARF SECTION

DRAWING NO.	**S-01**
PROJECT NO.	A15.0232.00
DATE:	3/17/15
SHEET NO.	4 OF 4

Last Saved by: Tony.pritchett on: Mar 17, 2015 12:55 PM File: Q:\Portland\2015\A15.0232\00\CADD\Dwgs\Permit Dwgs\04_S01-P.dwg

Appendix B

Project Photographs

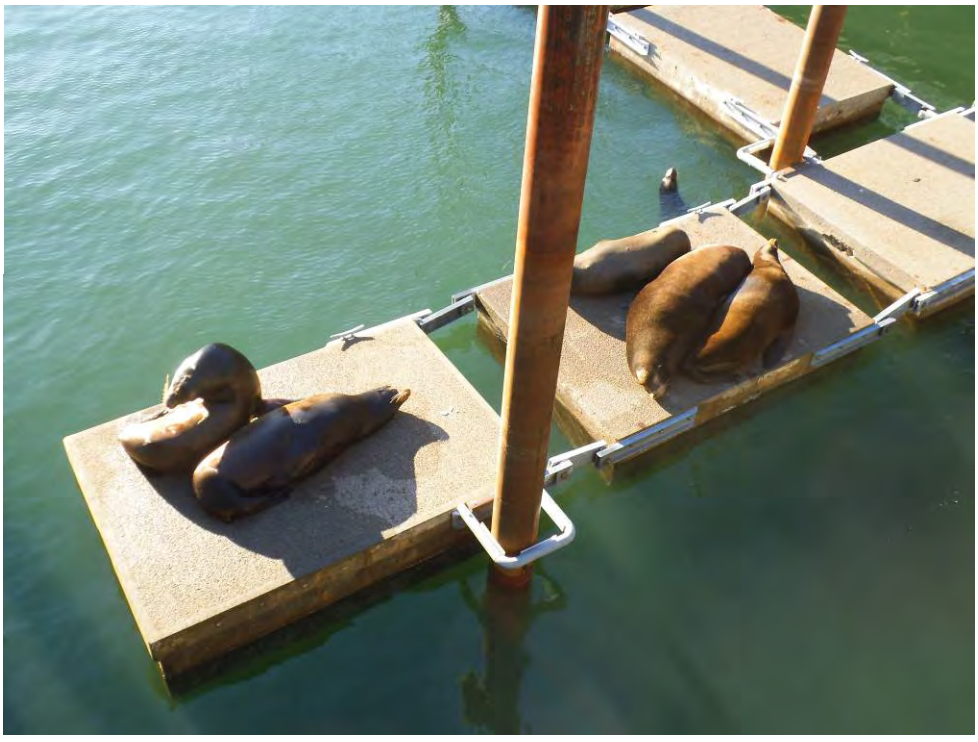
Photo 1: View to the south showing the existing Undersea Gardens and proposed location for the new transload facility (photo taken January 30, 2015).

Photo 2: View to the southwest showing the existing Undersea Gardens and associated structures.

Pacific Habitat Services, Inc.
9450 SW Commerce Circle, Suite 180
Wilsonville, OR 97070

Photo 3: View to the southeast showing the Marine Jetty haul out site (photo taken January 30, 2015).

Photo 4: View to the west showing the Port Dock One haul out site (photo taken January 30, 2015).



Pacific Habitat Services, Inc.
9450 SW Commerce Circle, Suite 180
Wilsonville, OR 97070

Appendix C

Pile Driving Data

Table 1
Summary of Pile Driving Data

Tongue Point Sound Pressure Levels - D46-42 Diesel Impact Hammer - 11/17 - 18/2008												
Pile	Time	Depth Hydrophone / water (meters)	Bubble Ring	Location	Peak (dB re:1uPa)		RMS_{imp} (dB re:1uPa)		SEL (dB re:1uPa^2-Sec)		Accumulated SEL (dB re:1uPa^2-Sec)	
					Mean	Range	Mean	Range	Mean	Range	Measured Bubble Ring On and Off	Calculated Assumes the Bubble Ring on for Duration of Drive
Pile 1												
1	2:11:47 - 2:12:55	3 / 6	Off	10 meters	193	190 - 194	178	176 - 181	167	164 - 170		
1	2:12: 25 - 2:15:15	3 / 6	On	10 meters	181	177 - 188	165	161 - 173	154	150 - 160		
1	2:16:56 - 2:17:16	3 / 6	Off	10 meters	197	193 - 198	183	182 - 184	169	168 - 171		
1	2:17:17 - 2:20:14	3 / 6	On	10 meters	182	179 - 184	166	163 - 180	154	149 - 157	191	182
1	2:20:15 - 2:21:15	3 / 6	Off	10 meters	197	192 - 201	183	177 - 186	171	165 - 173		
1	2:21:16 - 2:22:35	3 / 6	On	10 meters	183	182 - 186	168	166 - 172	157	156 - 159		
1	2:22:56 - 2:23:41	3 / 6	Off	10 meters	197	196 - 198	181	179 - 183	169	167 - 170		
Pile 2												
2	3:13:57 - 3:14:27	3 / 7	Off	10 meters	206	205 - 206	186	184 - 187	175	171 - 176		
2	3:14:28 - 3:18:04	3 / 7	On	10 meters	180	177 - 184	163	162 - 176	155	148 - 159		
2	3:18:05 - 3:19:00	3 / 7	Off	10 meters	197	190 - 200	179	174 - 181	166	160 - 169	191	184
2	3:19:01 - 3:22:15	3 / 7	On	10 meters	180	179 - 182	164	162 - 177	155	147 - 156		
2	3:22:16 - 3:24:14	3 / 7	On[1]	10 meters	184	182 - 196	168	164 - 172	159	150 - 161		
Pile 3 - Driven in partially on 11/17/2008 Completed on 11/18/2008												
3	11/17/2008 - 3:45:07 - 3:46:51	4 / 8	Off	10 meters	193	192 - 197	178	175 - 181	168	161 - 170		
3	11/17/2008 - 3:46:52 - 3:50:43	4 / 8	On	10 meters	186	180 - 190	168	163 - 168	157	149 - 160	185	181
3	11/18/2008 - 9:11:47 - 9:15:28	4 / 8	On	10 meters	185	180 - 189	168	163 - 170	157	149 - 159		
Pile 4												
4	4:16:50 - 4:17:05	4 / 8	Off	10 meters	192	189 - 195	177	168 - 179	166	162 - 168		
4	4:17:06 - 4:20:55	4 / 8	On	10 meters	188	185 - 189	168	166 - 170	157	154 - 159	187	184
4	4:20:56 - 4:21:34	4 / 8	Off	10 meters	196	192 - 198	178	171 - 180	166	161 - 169		
4	4:21:35 - 4:24:18	4 / 8	On	10 meters	189	188 - 190	167	162 - 171	158	152 - 160		
Pile 5 - Was driven with the bubble rings on the entire drive Power setting on hammer were tested												
5	9:35:21 - 9:36:32	4 / 9	On	10 meters	181	178 - 181	165	163 - 166	152	150 - 154		
5	9:36:33 - 9:38:30	4 / 9	On	10 meters	185	184 - 186	168	167 - 169	156	150 - 157	181	181
5	9:38:31 - 9:41:01	4 / 9	On	10 meters	186	184 - 187	169	167 - 170	157	149 - 158		
5	9:41:02 - 9:41:47	4 / 9	On	10 meters	185	184 - 187	168	167 - 170	157	150 - 158		
Pile 6 - Was driven with the bubble rings on the entire drive												
6	11:23:21 - 11:34:34	5 / 9	On	10 meters	182	176-185	165	157 - 168	154	142 - 157	181	181
6	11:23:21 - 11:34:34	4 / 8	On	20 meters	167	162 - 171	ND	ND	145	132 - 147		
Pile 7												
7	12:45:13 - 12:45:46	5 / 9	Off	10 meters	190	187 - 191	ND	ND	161	157 - 162		
7	12:45:13 - 12:45:46	4 / 8	Off	20 meters	189	188 - 191	ND	ND	161	157 - 163		
7	12:45:47 - 12:49:01	5 / 9	On	10 meters	172	169 - 178	ND	ND	151	149 - 152		
7	12:45:47 - 12:49:01	4 / 8	On	20 meters	167	162 - 173	ND	ND	141	136 - 144	180[3]	177[3]
7	12:49:02 - 12:49:36	5 / 9	Off	10 meters	189	185 - 192	ND	ND	160	157 - 163		
7	12:49:02 - 12:49:36	4 / 8	Off	20 meters	188	186 - 191	ND	ND	160	159 - 163		
7	12:49:37 - 12:52:05	5 / 9	On	10 meters	177	174 - 178	159	155 - 161	151	149 - 153		
Pile 8												
8	1:24:23 - 1:26:37	5 / 9	On	10 meters	185	171 - 187	170	168 - 172	158	143 - 160		
8	1:26:38 - 1:27:31	5 / 9	Off	10 meters	203	201 - 205	187	184 - 188	172	169 -175	192	183
8	1:27:32 - 1:29:18	5 / 9	On	10 meters	189	186 - 190	172	168 - 172	160	157 - 162		
8	1:29:19 - 1:29:54	5 / 9	Off	10 meters	205	196 - 207	189	187 - 190	174	161 - 177		
Pile 9 - Bubble rings were not totally deployed during the first art of the drive												
9	13:42:21 - 13;45:02	5 / 10	Off[2]	10 meters	197	195 - 198	183	180 - 184	170	166 - 171		
9	14:11:55 - 14:12:31	5 / 10	Off	10 meters	199	191 - 200	ND	ND	171	167 - 172	193	182
9	14:12:32 - 14:18:19	5 / 10	On	10 meters	185	183 - 188	169	168 - 170	156	149 - 159		
9	14:18:20 - 14:18:37	5 / 10	Off	10 meters	193	191 - 194	181	179 - 182	168	163 - 169		
Pile 10												
10	15:14:56 - 15:17:10	Installed with a Vibratory Hammer			167	164 - 168	150	145 - 156	152	148 - 156		
10	15:42:47 - 15:43:13	5 / 10	Off	10 meters	197	196 - 198	180	177 - 182	169	167 - 170		
10	15:42:47 - 15:43:13	4 / 9	Off	20 meters	183	181 - 192	168	166 - 170	155	152 - 157		
10	15:43:14 - 15:46:40	5 / 10	On	10 meters	183	180 - 186	168	166 170	156	151 - 158		
10	15:43:14 - 15:46:40	4 / 9	On	20 meters	170	167 - 174	153	151 - 161	141	137 - 144		
10	15:46:41 - 15:47:02	5 / 10	Off	10 meters	196	194 - 199	180	179 - 182	168	167 - 169	187[3]	183[3]
10	15:46:41 - 15:47:02	4 / 9	Off	20 meters	182	180 - 186	166	161 - 168	153	150 - 155		
10	15:47:03 - 15:50:10	5 / 10	On	10 meters	188	182 - 188	169	165 - 171	157	151 - 159		
10	15:47:03 - 15:50:10	4 / 9	On	20 meters	172	167 - 178	155	150 - 161	142	134 - 147		
10	15:50:11 - 15:50:51	5 / 10	Off	10 meters	199	191 - 203	182	174 - 185	170	163 - 172		
10	15:50:11 - 15:50:51	4 / 9	Off	20 meters	180	179 - 181	164	163 - 166	152	152 - 152		

[1] Only Bottom Ring Used

[2] Bubble rings were hung up on cross beams on existing dock and not fully deployed

[3] Measured at 10m distance